TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

APPENDICES

GLOSSARY OF AVIATION TERMS

Skagit Regional Airport
Airport Master Plan Update

Chapter One

Inventory of Existing Conditions

CHAPTER ONE
INVENTORY OF EXISTING CONDITIONS

INTRODUCTION

The purpose of this chapter is to document the existing facilities and conditions at Skagit Regional Airport. This project updates the 1995 Airport Master Plan Update, which serves as a primary source for inventory data.[1] However, where available, more current or comprehensive data have been included in the chapter to illustrate current conditions. Existing airfield facilities were examined during on-site inspections to update facility inventory data. The consultants also worked closely with Port staff to review the current facility and operational data maintained by the Port. Historical data from a variety of sources are used in this evaluation:

- **Skagit Regional Airport - Master Plan Update** (W&H Pacific, June 1995)
- **Skagit Regional Airport – 2005 Pavement Management Report** (Applied Pavement Technology, Inc., February 2006)
- **Skagit Regional Airport Land Use Compatibility Study** (Reid Middleton, May 2000)
- **Skagit County Draft Bayview Ridge Subarea Plan (January 2004)**
- **Skagit WIN Advance Compensation Agreement (September 11, 1998)**
- **Airport Obstruction Chart (OC)** (National Ocean Service; surveyed 1997, published 1999)
- **FAA Airport Master Record Form (5010-1)**
- **Airport/Facility Directory (AFD) –Northwest U.S.** (U.S. DOT, Federal Aviation Administration, National Aeronautical Charting Office); **Airport Directory** (Airnav.com)
- **Seattle Sectional Aeronautical Chart; IFR Enroute Low Altitude (L-1) Chart** (U.S. DOT, Federal Aviation Administration, National Aeronautical Charting Office)
- **Instrument Approach Procedure Charts** (Jeppesen Airway Manual)
- Local land use planning documents, zoning ordinances and mapping
- Local and regional socioeconomic data
- Port of Skagit airport records

[1] Skagit Regional Airport Master Plan Update (W&H Pacific, June 1995)

A glossary of aviation terminology has been provided at the end of the report to describe technical items and aviation jargon commonly in use in this study. Significant correspondence and related items accumulated during the course of the project is included in **Appendix E**.

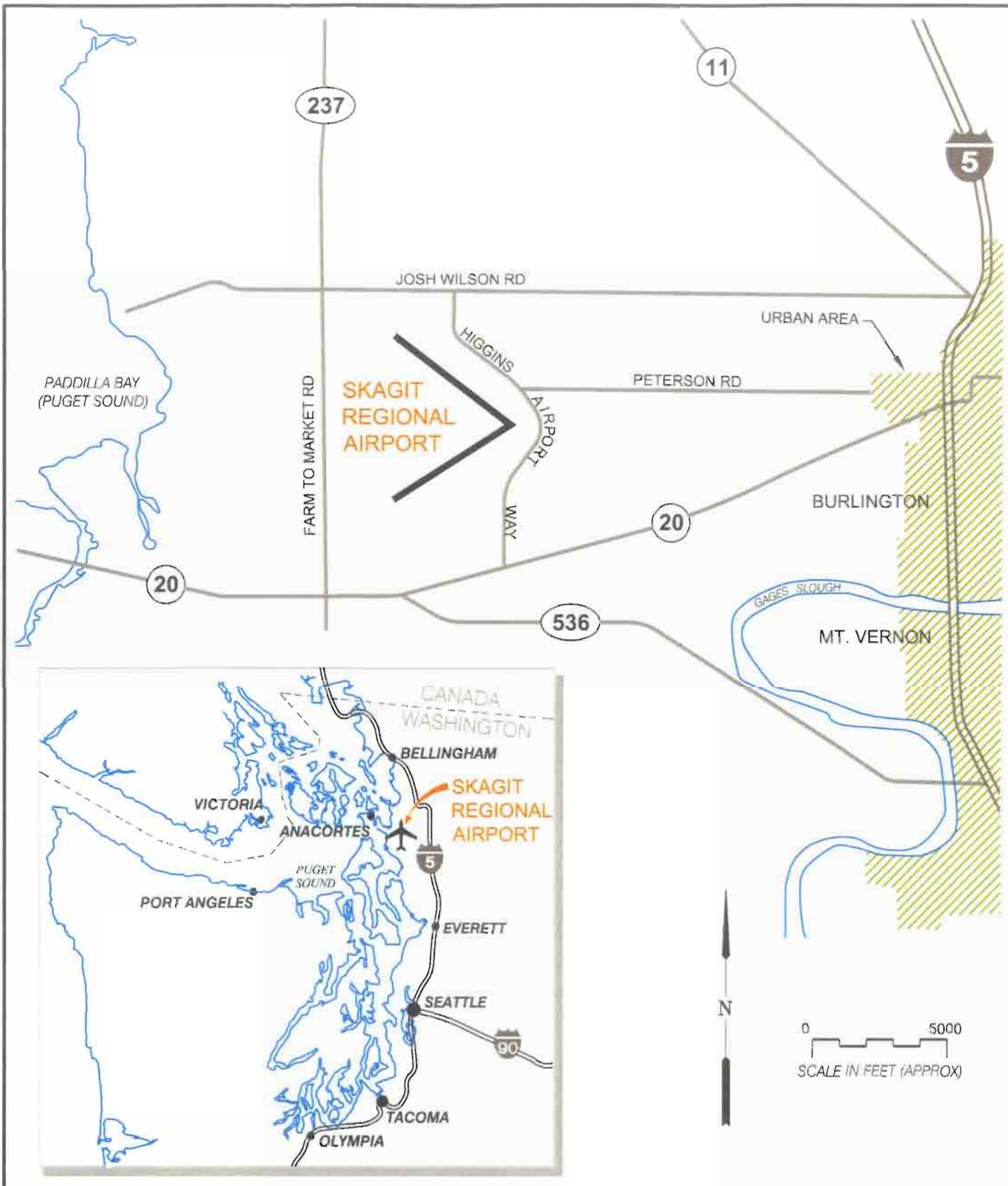
AIRPORT LOCALE

Skagit Regional Airport (also referred to as "BVS" or "Skagit Regional") is owned and operated by the Port of Skagit County, Washington. The airport is located approximately three miles west of Burlington, west of U.S. Interstate 5 (I-5) and north of State Highway 20. Via I-5, Burlington is located approximately 65 miles north of Seattle; 38 miles north of Everett; 25 miles south of Bellingham; and 75 miles south of Vancouver, British Columbia. From Burlington, Highway 20 travels west to serve Anacortes, Oak Harbor and greater Whidbey Island. Higgins-Airport Way is the main access road for BVS that connects to Highway 20 and Josh Wilson Road, the two primary travel routes between the airport and Burlington. A location and vicinity map for Skagit Regional Airport is provided in **Figure 1-1**.

Skagit County is located in northwest Washington, bordered by Whatcom County to the north; Snohomish County to the south; San Juan County and Island County to the west; and Okanogan County to the east. Skagit County has a land area of approximately 1,562 square miles, extending from Puget Sound to the west slopes of the Cascade Range. Skagit County is comprised predominantly of agricultural and forest lands, with several small communities located in a predominately rural setting.

PHYSICAL GEOGRAPHY

Skagit Regional Airport is located on a topographic bench above the Skagit and Samish River floodplains. The area generally slopes very gently toward the south. The airport and surrounding areas are located within the Padilla Bay watershed. The only stream course that traverses the Port's property is Higgins Slough, which flows along the southern boundary of the property and crosses Higgins Airport Way just north of Highway 20. Other major drainage courses in the airport vicinity include Indian Slough, Little Indian Slough, and No Name Slough, which drain to Padilla Bay southwest of the property. Joe Leary Slough is located northeast of the property. The Skagit River is located southeast of the property and the Samish River is located to the north. Agricultural land surrounds Bayview Ridge to the south and east, in the Skagit and Samish River floodplains.



PORT OF SKAGIT COUNTY

CENTURY WEST ENGINEERING CORPORATION

DAVID EVANS AND ASSOCIATES INC

LOCATION MAP

FIGURE

SKAGIT REGIONAL AIRPORT
AIRPORT MASTER PLAN

1 - 1

CLIMATE

The western part of Skagit County has a temperate climate with relatively mild seasons that is heavily marine-influenced with moderately high levels of precipitation. The temperate climate combined with rich soils contributes to the area's prime agricultural growing conditions.

Detailed climatic data for Mount Vernon (Station: 455678 Mount Vernon 3 WNW), located within 5 miles, southeast of BVS, is available for a 48-year period between 1956 and 2004.[2] The data indicate that July and August are typically the warmest months; December and January are the coldest. On a monthly basis, the average maximum temperature is 73.8 degrees Fahrenheit (August) and the average minimum temperature is 33.6 degrees (January). The highest and lowest recorded temperatures at the Mount Vernon observation site are 98 degrees F (August 9, 1960) and -4 degrees F (January 26, 1957). Mount Vernon averages 32.32 inches of precipitation and 3.8 inches of snowfall annually. Historically, nearly 50 percent of annual precipitation occurs in the months of October through January.

Tabulated wind data for BVS is available for the period between January 1948 and June 1951.[3] The data indicate prevailing winds are southeast-northwest, favoring Runway 10/28, however, strong southerly winds also occur seasonally, which are aligned more with Runway 04/22.

SOCIOECONOMIC CONDITIONS

Population

The population of Skagit County was estimated at 108,800 residents in 2004 by the Washington State Office of Financial Management (OFM). This is a 5.65 percent increase over the 2000 U.S. Census data of 102,979 residents, which equates to an average annual increase of 1.38 percent. Between 1990 and 2000, the population of Skagit County increased by 29.46 percent, making it the ninth fastest growing county in the State, with an annual average increase of 2.62 percent over the ten-year period. Total population in the Bayview Ridge Subarea was reported as approximately 1,700 in the 2000 U.S. Census. The OFM prepares low, intermediate, and high population projections for

[2] Western Regional Climate Center.
[3] Source: U.S. Department of Commerce National Weather Records Center, Ashville, NC. July 1948 to June 1951 (observation site: Mt. Vernon).

counties in Washington State. The OFM intermediate projection series for Skagit County is provided in **Table 1-1**.

TABLE 1-1: SKAGIT COUNTY OFM POPULATION 2005-2025 INTERMEDIATE PROJECTIONS [4]

Year	Population	Overall Increase/Decrease *(from prior forecast year)*	Average Annual Rate of Increase/Decrease *(from prior forecast year)*
2005	113,136	--	--
2010	123,807	+9.43%	+1.82%
2015	135,717	+9.62%	+1.85%
2020	150,449	+10.86%	+2.08%
2025	164,797	+9.54%	+1.84%

The Growth Management Act (GMA) Steering Committee adopted a 2025 population forecast and allocation for Skagit County based on a mid-point between the low and intermediate OFM projections. The adopted 2025 population forecast for Skagit County is 149,080, with an allocation of 5,600 residents for the Bayview Ridge Subarea. The GMA forecasts and allocations for the Bayview Ridge Subarea and Skagit County as a whole are provided in **Table 1-2**.

TABLE 1-2: GMA SKAGIT COUNTY POPULATION FORECAST AND ALLOCATION SUMMARY FOR THE BAYVIEW RIDGE SUBAREA

	Skagit County	Bayview Ridge Subarea
2000 Population (2000 U.S. Census)	102,979	1,700
Forecast 2015 Population*	137,700	3,420
Forecast 2025 Population*	149,080	5,600

*Forecast figures are from adopted Countywide Planning Policy 1.1 (GMA Goal 1).

Skagit County faces challenges in accommodating the projected population growth within existing municipal boundaries due to a lack of available land or water/sewer capacity. The Bayview Ridge Subarea was originally designated a non-municipal UGA by Skagit County due to its unique position on a topographic bench above the Skagit River floodplain, as well as the availability of extensive

[4] Office of Financial Management, Olympia, WA. 2002. Excerpted from Skagit County in Transition Demography 2003. Skagit County Health Department.

infrastructure and the existing high-density residential development pattern already established in portions of the Subarea. The Western Washington Growth Management Hearings Board reduced the Bayview Ridge UGA outside of the Port's property and a limited section of privately held land located adjacent to the Port's property in 1998. The area inside the Port's property was retained as UGA due to the existing industrial development. Since 1998, the County has initiated a planning process for the Bayview Ridge Subarea, with the goal of accommodating additional residential housing in this area in the future. The area is expected to experience significant growth over the next 20 years.

Economy

Major industries in Skagit County include agriculture, fishing, wood products, tourism, international trade, and specialized manufacturing. The Ports of Skagit County and Anacortes provide access for industry in the county. Shell Oil Company and Tesoro both maintain refineries in the county on Fidalgo Island. Construction of several new shopping centers, outlet malls, and restaurants in the 1990s has driven an increase in jobs in the retail and services industries. The largest employment sector in Skagit County is wholesale and retail trade, which accounted for 24.7 percent of all non-farm employment in 2000.[5] Personal and professional service industries are the second largest employers in Skagit County, accounting for 21 percent of all non-farm employment in 2000. The median household income in Skagit County was reported as $42,381 for the Year 1999 in the 2000 Census. This is slightly lower than the statewide median household income of $45,776.

Table 1-3 outlines the Employment Security Department's industry projections for Skagit County and Washington State as a whole. These projections indicate that employment numbers are expected to increase at a rate of 12.6 percent by 2008, slightly behind the total expected growth for the state of 13.4 percent. Approximately 5,300 new jobs are expected to be created in Skagit County by 2008, approximately 3,300 of which are expected to be in the trade and services sectors.

[5] Skagit County Profile. January 2002. Labor Market and Economic Analysis Branch, Employment Security Department.

TABLE 1-3: EMPLOYMENT ESTIMATES AND INDUSTRY PROJECTIONS FOR SKAGIT COUNTY AND WASHINGTON STATE, 2000 & 2008

	Skagit County				Washington State			
	2000	2008	% Chg	% Growth	2000	2008	% Chg	% Growth
Total Nonfarm Employment	41,930	47,230	12.6%	1.5%	2,716,800	3,080,700	13.4%	1.6%
Manufacturing	5,920	6,160	4.1%	0.5%	350,300	365,500	4.3%	0.5%
Construction/Mining	3,200	3,450	7.8%	0.9%	161,600	180,000	11.4%	1.4%
Transportation & Public Utilities	1,810	1,920	6.1%	0.7%	146,600	162,200	10.6%	1.3%
Wholesale & Retail Trade	11,060	12,650	14.4%	1.7%	653,200	731,400	12.0%	1.4%
Finance, Insurance & Real Estate	1,300	1,470	13.1%	1.5%	137,200	153,300	11.7%	1.4%
Services	10,090	11,790	16.8%	2.0%	780,800	940,800	20.5%	2.4%
Government	8,550	9,790	14.5%	1.7%	483,500	543,700	12.5%	1.5%

With significant growth occurring in the retail and services industries, tourism-related spending is expected to represent a growing portion of the local economy. Travel spending by visitors to Skagit County generated $14.8 million in state and local tax receipts during the period 1991-2003.[6] Tourist attractions in the Skagit County area include the Skagit Valley Tulip Festival, scenic tours and outdoor activities in the San Juan Islands and north Puget Sound, local art festivals, farmers markets, and bird watching. The Skagit and Samish River flats are nationally known for winter raptor watching and visitors are attracted to the upper Skagit River each year to observe the largest wintering population of bald eagles in the lower 48 states.

E.D. Hovee & Company (EDH) prepared the most recent employment forecasts for Skagit County for the Skagit Council of Governments (SCOG) in 2003.[7] This employment forecast was based on the population projections adopted by the GMA Steering Committee. A summary of the EDH employment forecasts for the County, including both wage and salary jobs and self-employment, is provided in **Table 1-4.**

[6] Washington State County Travel Impacts 1991-2003. September 2004. State of Washington Department of Community Trade and Economic Development. Prepared by Dean Runyan Associates.

[7] Skagit County Population & Employment Allocation Final Report. December 2003. Berryman & Henigar, Inc. in association with Michael J. McCormick.

TABLE 1-4: EDH EMPLOYMENT FORECAST SUMMARY SKAGIT COUNTY [8]

	Total Jobs	Predicted Increase	Average Annual Rate of Increase
Total 2000 Jobs	47,880	--	--
Forecast 2015 Jobs	59,110	11,230 (2000-2015)	1.41%
Forecast 2025 Jobs	71,390	12,280 (2015-2025)	1.91%

The Port of Skagit County's Bayview Business and Industrial Park (BBIP) is a significant contributor of jobs and economic opportunities for the county. According to a census conducted by the Port in October, 2004, BBIP had 38 tenants and sub-tenants with full time employment of 750 and part time employment of 45. It is estimated that BBIP has approximately 960,000 square feet of building space currently developed. The Port's October 2004 census listed 20 airport tenants and sub-tenants with a combined employment of 55 full time and 22 part time positions. **Table 1-5** summarizes the airport tenants/sub-tenants based on an updated list from August 2007.

TABLE 1-5: SUMMARY OF AVIATION-RELATED BUSINESSES LOCATED AT SKAGIT REGIONAL AIRPORT (8/07)

Acros Corporation	Corporate Air Center, LLC	Padilla Limited Partnership
Bayview Executive Hangars, LLC	Crosswinds Restaurant	
Chuckanut Building, LLC	Dean Holt Construction, LLC	Skagit Airport Hangar Condo Association
Civil Air Patrol	Federal Express	Stu-Max Building, LLC
Concorde Group Aviation, Inc	Glacier Helicopters	ViaJet Aircraft Management, LLC
Corporate Air West		

Source: Port of Skagit Tenant Census (updated 8/04). Does not include Bayview Business & Industrial Park (BBIP)

In 2001, the Washington State Department of Transportation (WSDOT) - Aviation Division, conducted a study of the economic impacts of Washington State airports. The study evaluated the economic contribution of the Skagit Regional Airport from direct impacts, indirect impacts, and induced impacts. Direct impacts are those expenditures related to direct passenger/cargo transport, aviation functions, and direct support services for transport/aviation functions at the airport. Indirect impacts are those regional expenditures resulting from aviation-related tourism (hotels, restaurants,

[8] E.D. Hovee & Company, November 2003. Excerpted from Skagit County Population & Employment Allocation Final Report. December 2003. Berryman & Henigar, Inc. in association with Michael J. McCormick.

etc) and other economic activities that are dependent on the airport. The induced impact is the "multiplier effect" related to increased regional demand for goods and services, and the increased circulation of money in the local community that results from the airport. In the WSDOT study, the total economic impact of the airport was taken as the sum of all direct, indirect, and induced impacts on the regional economy.

The results of the WSDOT study estimated the total annual economic contribution of the Skagit Regional Airport to the state on three key economic indicators: jobs, labor earning, and economic activity. These results are summarized in **Table 1-6**.

TABLE 1-6: ANNUAL ECONOMIC IMPACT SUMMARY FOR SKAGIT REGIONAL AIRPORT* [9]

Jobs (Employment)	Labor Earnings (Payroll)	Economic (Sales Output)
178.5	$3,274,429	$11,668,958

* Results based on 1998 data.

HISTORICAL AVIATION ACTIVITY

The 1995 Airport Master Plan estimated that Skagit Regional had 143 based aircraft and approximately 55,230 aircraft operations in 1993. Single-engine piston aircraft accounted for more than 90 percent of both the based aircraft and operations totals. A based aircraft count conducted by the Port in 1998 totaled 119, including 113 single engine aircraft, 4 multi-engine aircraft and 2 jets. This updated count was lower than the totals documented in the previous master plan in 1992-1993.

Air cargo activity in 1992 was estimated at 4,370 operations (7.9% of total activity), consisting of both package express carriers and local air cargo operations (Aeronautical Services and Methow Aviation). Cargo activity at BVS now primary consists of twice-daily FedEx Caravan flights, which generate just over 1,000 annual operations between BVS and Seattle (Boeing Field). At the time of this master plan update, Methow's operations at BVS had been significantly curtailed and Aeronautical Services ceased operations. In late 2004, Kenmore Air initiated scheduled passenger service between BVS and Boeing Field with three daily departures. During its brief period of service, the number of daily departures fluctuated based on demand levels and service was eventually

[9] Washington State Department of Transportation Aviation Division. Economic Impacts of Washington Airports. 2001.

terminated in early 2005. Recent Port estimates of airport activity are summarized in **Table 1-7**. Additional historic data are summarized in Chapter Two– Aviation Forecasts.

TABLE 1-7: HISTORICAL AVIATION ACTIVITY SKAGIT REGIONAL AIRPORT

Activity Type	Activity Level
Based Aircraft *2005 Port Estimate (1/27/05)*	
Single-Engine Piston	137
Multi-Engine Piston	3
Turboprop	6
Turbojet	4
Rotorcraft	6
Other (glider, ultralight)	2
Total Based Aircraft	**158**
Annual Aircraft Operations *2002 Port Estimate*	79,000

Airport History

The current airport site was originally developed in 1933 when a single runway was constructed in a joint project of the Works Progress Administration (WPA) and the Public Works Administration (PWA). In 1943, the U.S. Navy constructed a triangular runway-taxiway system and the airport served as an alternate airfield to the Whidbey Island Naval Air Station. Following World War II, the federal government continued to operate the airport until 1958 when ownership was transferred to the Board of Skagit County Commissioners. The transfer from federal to local ownership was conducted through the Surplus Property Act of 1944 and the Federal Property and Administration Service Act of 1949. In 1965, airport ownership was transferred from the County to the Port Districts of Skagit County and Anacortes. In 1975, the Port of Skagit County assumed full ownership of the airport.

The existing dual runway-taxiway configuration is largely unchanged from the original airfield construction, although several improvement projects have been completed in recent years to upgrade the facilities. The majority of landside facility development at BVS has historically occurred along the north side of Runway 10/28 and development has continued recently with the recent construction of several executive hangars and the new bulk fuel storage and dispensing area located near the west end of the flightline. However, in recent years, development of landside facilities has extended to the south side of Runway 4/22, including a small aircraft parking apron, temporary fuel tank with card

lock (now removed); several hangars located near the end of Runway 22 (Lots 2-5); a new bulk fuel storage and dispensing area (Lot 16); a new fixed base operator (FBO) hangar (Lot 17); and a 10-unit condominium T-hangar (Lot 18).

A large portion of the airport site contains jurisdictional wetlands, which has affected recent development patterns and is expected to continue being a significant factor in siting future airfield improvements. The Port entered the Skagit WIN Advance Compensation Agreement, dated September 11, 1998 to permanently protect high functioning wetlands and to allow the filling of lower functioning wetlands. This agreement was signed by the FAA, the Washington State Department of Ecology, the EPA, Skagit County, and the Port of Skagit County.

AIRFIELD FACILITIES

BVS has two runways and an extensive taxiway system that provides access to all developed areas of the airfield. The published airfield elevation is 144 feet above mean sea level (MSL).[10] Historically, BVS has served a variety of general aviation users, including business, commercial, and recreational aviation. **Table 1-8** summarizes airport data. **Figure 1-2** provides location and site maps of the airport. **Figure 1-3** provides enlarged views of existing facilities located along Runway 10/28 and Runway 4/22.

BVS is an uncontrolled field, which effectively limits operations to one runway at a time. Pilots use the airport Unicom/common traffic advisory frequency (CTAF) for communications on the ground and in the vicinity of the airport. The runways utilize standard left traffic patterns with a pattern altitude of 1,144 feet MSL, which is approximately 1,000 feet above ground level (AGL). Published airport facility directories indicate that ultralight operations occur on the northwest 2,000 feet of parallel taxiway for Runway 10/28. Ultralight traffic is required to remain east of the airfield with a pattern altitude of 500 feet AGL.

[10] 143.8 feet. Surveyed June 1997 by the National Ocean Service (NOS). National Geodetic Vertical Datum of 1988 (NGVD 88); North American Datum of 1983 (NAD 83)

TABLE 1-8: AIRPORT DATA (BVS)

Airport Name/Designation	Skagit Regional Airport (BVS)
Airport Owner	Port of Skagit County
Date Established	1933
Airport Category	National Plan of Integrated Airport Systems (NPIAS) General Aviation FAA Airport Reference Code: BVS currently meets criteria for B-II on Runway 10/28; B-I (small) previously depicted on 1995 ALP. Washington Aviation System Designation: General Aviation Airport
Airport Acreage	Approximately 1,835.8 Acres (held in fee), as depicted on updated Exhibit "A" Airport Property Map (Sheet 11 of 11 in ALP drawing set)
Airport Reference Point (ARP) Coordinates	N 48°28.25' W 122° 25.25'
Airport Elevation	144 feet Mean Sea Level (MSL)
Airport Traffic Pattern Configuration/Altitude	Left Traffic - 1,144 feet above mean sea level (MSL) Ultralight Traffic Pattern 500' AGL (east of field)

LEGEND

1. RUNWAY 10/28: 5477' X 100'
2. RUNWAY 4/22: 3000' X 60'
3. TERMINAL BUILDING
4. T-HANGAR
5. CONVENTIONAL HANGAR
6. FIXED BASE OPERATOR
7. AIRCRAFT FUELING AREA
8. AIRCRAFT PARKING APRON
9. TAXIWAY F - HANGAR/APRON
10. NONDIRECTIONAL BEACON (NDB)
11. AWOS
12. AIRPORT BEACON
13. COMPASS ROSE
14. FUEL FARM (NON-AVIATION)
15. MAINTENANCE FACILITY
16. SEGMENTED CIRCLE-WIND CONE
17. AIRPORT COMMERCIAL
18. AIRPORT INDUSTRIAL PARK
19. PACCAR TECH. CENTER
20. FIRE TRUCK STORAGE (SEE FIG. 1-3)
21. VEHICLE PARKING (SEE FIG. 1-3)
22. RESTROOMS
23. AIRCRAFT CARGO APRON
- A. TAXIWAY A
- B. TAXIWAY B
- C. TAXIWAY C
- D. TAXIWAY D
- F. TAXIWAY F
- G. TAXIWAY G

PROPERTY BOUNDARY

TERMINAL AREA FACILITIES
(SEE FIGURE 1-3 FOR DETAIL)

SOURCE: WALKER AND ASSOCIATES
(6-17-04)

500 0 500
SCALE: 1"=500'

PORT OF SKAGIT COUNTY

CENTURY WEST ENGINEERING CORPORATION

DAVID EVANS AND ASSOCIATES INC

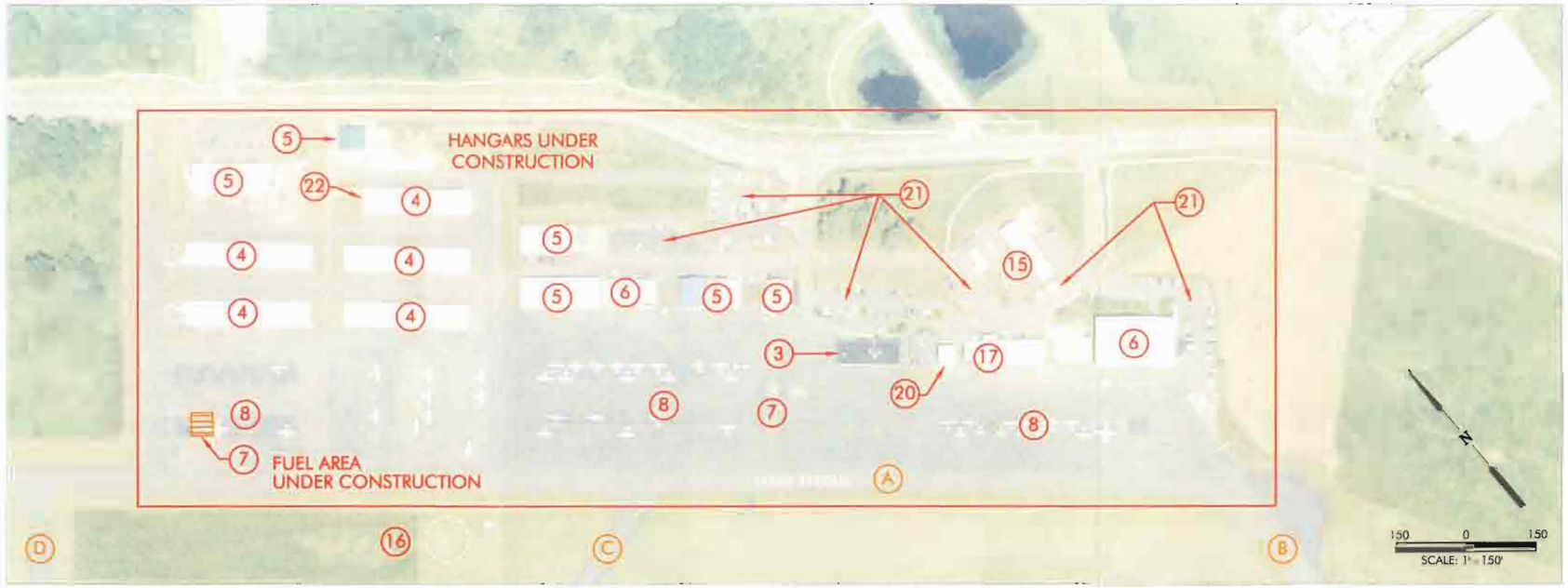
EXISTING CONDITIONS

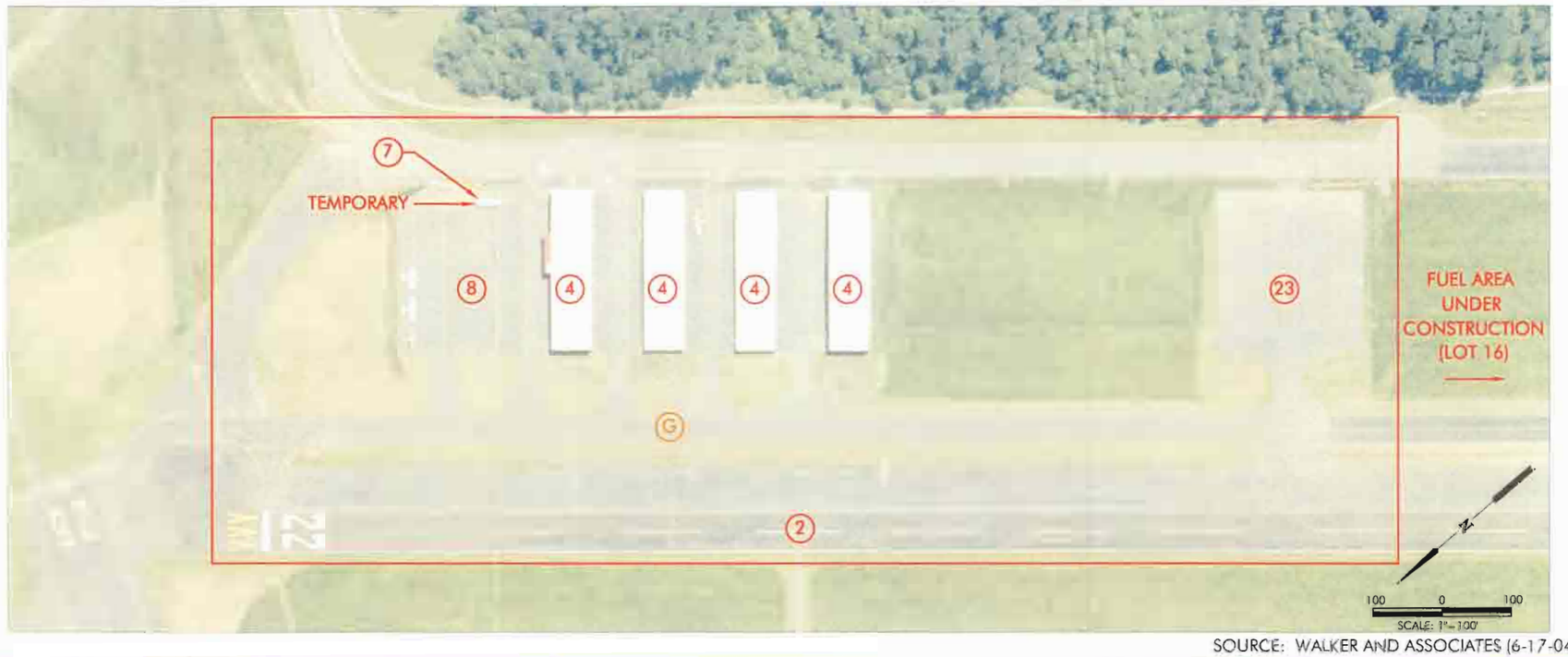
SKAGIT REGIONAL AIRPORT
AIRPORT MASTER PLAN

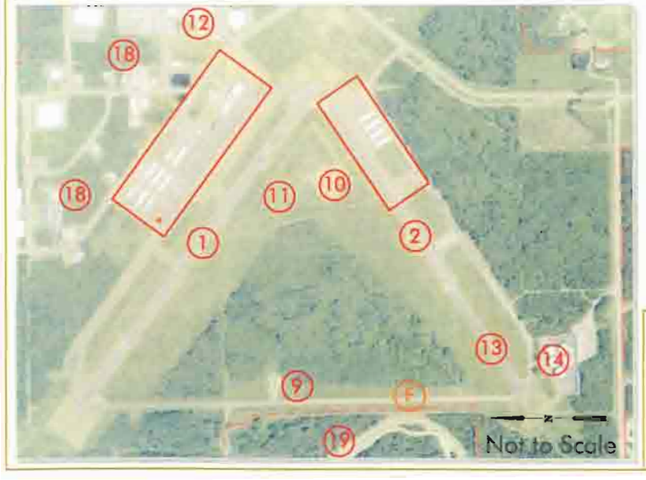
FIGURE
1-2

LEGEND

1. RUNWAY 10/28: 5477' X 100'
2. RUNWAY 4/22: 3000' X 60'
3. TERMINAL BUILDING
4. T-HANGAR
5. CONVENTIONAL HANGAR
6. FIXED BASE OPERATOR
7. AIRCRAFT FUELING AREA
8. AIRCRAFT PARKING APRON
9. TAXIWAY F - HANGAR/APRON
10. NONDIRECTIONAL BEACON (NDB)
11. AWOS
12. AIRPORT BEACON
13. COMPASS ROSE
14. FUEL FARM (NON-AVIATION)
15. MAINTENANCE FACILITY
16. SEGMENTED CIRCLE-WIND CONE
17. AIRPORT COMMERCIAL
18. AIRPORT INDUSTRIAL PARK
19. PACCAR TECH. CENTER
20. FIRE TRUCK STORAGE
21. VEHICLE PARKING
22. RESTROOMS
23. AIRCRAFT CARGO APRON
- A. TAXIWAY A
- B. TAXIWAY B
- C. TAXIWAY C
- D. TAXIWAY D
- F. TAXIWAY F
- G. TAXIWAY G







SOURCE: WALKER AND ASSOCIATES (6-17-04)

PORT OF SKAGIT COUNTY

CENTURY WEST ENGINEERING CORPORATION

DAVID EVANS AND ASSOCIATES INC

TERMINAL AREA

SKAGIT REGIONAL AIRPORT
AIRPORT MASTER PLAN

FIGURE: 1-3

Runways

Table 1-9 summarizes existing runway facilities at BVS.

TABLE 1-9: RUNWAY DATA (BVS)

Runway 10/28	
Dimensions	5,477 x 100 feet.
Bearing	N 52° 18' 50" W (True)
Effective Gradient	0.84%
Surface/Condition	Asphalt/Very Good (2005 PCI)
Weight Bearing Capacity (WBC)	19,000 pounds – Single Wheel (published in FAA Airport/Facility Directory). No Dual Wheel Capacity Published in AFD. 2003 estimate by Port pavement consultant 40,000 single wheel; 55,000 dual wheel and 90,000 dual tandem.
Marking	Visual. Runway numbers, centerline stripe, aiming point markings (both runway ends), taxiway lead-in lines.
Lighting	Medium Intensity Runway Edge Lighting (MIRL) VASI (Rwy 10 – 3.0 degree glide path) VASI (Rwy 28 – 3.5 degree glide path) REIL (Rwy 10 & 28)
Signage	Mandatory, Location, Directional, Destination Signs.
Wind Coverage	All Weather Coverage: 98.9% at 12 mph; 99.39% at 15 mph. Source: 1995 ALP; data from U.S. DOC National Weather Records Center (July 1948 to June 1951) at Mt. Vernon.
Runway 4/22	
Dimensions	3,000 x 60 feet
Bearing	N 57° 37' 33" E (True)
Effective Gradient	.040%
Surface/Condition	Asphalt/Fair (2005 PCI)
Weight Bearing Capacity (WBC)	17,000 pounds – Single Wheel (published in FAA Airport/Facility Directory); No Dual Wheel Capacity Published in A/FD. Port estimates pavement strength to be in the range of 10,000 to 12,500# single wheel. No pavement overlays since originally constructed.
Marking	Visual. Runway numbers, threshold bar, centerline stripe.
Lighting	Medium Intensity Runway Edge Lighting (MIRL) PAPI (Rwy 4 – 3.0 degree glide path) PAPI (Rwy 22 – 3.0 degree glide path)
Signage	Mandatory, Location, Directional, Destination Signs.
Wind Coverage	All Weather Coverage: 95.6% at 12 mph; 97.7% at 15 mph. Source: as noted above

The primary runway (10/28) is oriented in a northwest-southeast direction, which is generally in line with common prevailing winds. The secondary runway (4/22) is oriented northeast-southwest, which provides additional operational capabilities, particularly during strong southwesterly wind conditions. The two runways form an "open V" configuration facing west. Although the runways do not intersect, the ends of Runway 28 and 22 are in close proximity, with overlapping protected areas. Historically, Runway 10/28 accommodates a high percentage of airport operations at BVS, while Runway 4/22 is used predominantly by small aircraft during crosswind wind conditions, particularly during periods of strong southerly winds.

Runway 10/28

Runway 10/28 is paved and lighted with a full-length parallel taxiway (Taxiway A) on its north side. The published dimensions for Runway 10/28 are 5,477 by 100 feet. The runway has four exit taxiways that connect to the parallel taxiway. Taxiway A provides direct access from the runway to all facilities located on the north side of the airfield; additional taxiways provide access to other areas of the airfield.

Runway 10/28 has visual markings (runway designation numbers, centerline stripe, aiming point markings, side stripes). The runway center line and edge stripes were recently repainted and are in good condition. The runway numbers and aiming points are in fair condition. However, it is noted that since Runway 10/28 has existing straight-in nonprecision instrument approaches to both runway ends, nonprecision instrument runway markings are standard.

Although it is noted in several sources (including FAA Form 5010-1) that Runway 10/28 currently has nonprecision instrument runway markings, a review of recent aerial photography and site visits confirm that the runway ends do not have threshold marking bars, which are required in the FAA nonprecision runway marking standard. Based on the runway's 100-foot width, the threshold bars would consist of 8 stripes (150' long, 5.75' wide) beginning 20 feet from the end of useable pavement (runway end). For nonprecision instrument runways, the runway numbers are located beyond the threshold bars, approximately 210 feet from the end of the runway. The markings on Runway 10/28 should be upgraded to reflect existing instrument approach capabilities as part of a future pavement or marking project.

Runway 10/28 has extensive signage that conveys a variety of directional, location, and clearance information to pilots. The runways and all major taxiways have directional and holding position signs.

During a recent site inventory, Runway 10/28 was observed to be in generally good condition. However, recent pavement testing has confirmed that several sections of the runway have become "soft" and will eventually require repair or reconstruction. It is believed that this condition is caused

by the underlying soils and depth or base/subbase material. Data from the evaluation is summarized in the Airfield Pavement section of this chapter. The runway surface has also reportedly become increasingly prone to a "washboard" effect, due to settling of the subsurface drain system at fixed intervals along the runway.

Runway 4/22

Runway 4/22 is paved and lighted with a full-length parallel taxiway (Taxiway G) on its south side. The published dimensions for Runway 4/22 are 3,000 by 60 feet. The runway has three exit taxiways that connect to the parallel taxiway. Taxiway G provides direct access to all facilities located on the south side of the airfield; additional taxiways provide access to other areas of the airfield.

Runway 4/22 (formerly 3/21) was originally constructed at 5,000 x 150 feet. As the airport's crosswind runway, it was later narrowed and shortened to accommodate only small aircraft. The western 2,000 feet of the original runway is not currently designated as a taxiway, although a compass rose is located near the connection with Taxiway F and aircraft are able to access the end of Runway 4 from Taxiway F and Runway 10/28.

Runway 4/22 has visual markings (runway designation numbers, centerline stripe, side stripes). The markings were observed to be in good condition during a recent site visit. Both ends of Runway 4/22 are marked with three yellow arrowheads to distinguish between the useable runway and adjacent paved areas. It has been noted by local pilots that the yellow markings at the Runway 22 threshold may inadvertently lead pilots who are unfamiliar with the airfield to taxi directly to end of Runway 22 from Taxiway G. The unusable pavement located in this area should be clearly marked (or removed) to reduce inadvertent aircraft incursions.

Both ends of Runway 4/22 can be accessed from the north side of the airfield. Taxiway B provides access to the end of Runway 22 and the 4/22 parallel taxiway (Taxiway G). Taxiway F is an infield taxiway that provides access to the end of Runway 4 and Taxiway G from the end of Runway 10.

Runway Wind Coverage

It is generally preferable for aircraft to land and takeoff directly into the wind, although varying wind conditions often require crosswind operations at airports. When wind conditions exceed the capabilities of a specific aircraft or pilot, use of a crosswind runway (when available) may occur. At airports with single runways, occasional periods of strong crosswinds often limit operations until conditions improve.

The FAA-recommended planning standard is that primary runways should be capable of accommodating at least 95 percent of wind conditions within the prescribed crosswind component. This component is based on a direct crosswind (90 degrees to the direction of flight) of 12 miles per hour for small aircraft and 15 miles per hour for larger general aviation aircraft. Aircraft are able to tolerate increasingly higher wind speeds as the crosswind angle is reduced and moves closer to the direction of flight.

Tabulated wind data for the area (Mt. Vernon observation station) are available for the period between July 1948 and June 1951.[11] This data was used to create wind rose for the airport that graphically illustrates the relationship between the runways and wind conditions. The wind rose indicates that Runway 10/28 exceeds the FAA crosswind coverage standard for both small and large aircraft. The marginal increase in wind coverage provided by Runway 4/22 allows light aircraft to better operate in the occasional periods (less than 1 percent) of strong southwesterly winds. However, since Runway 10/28 meets the FAA wind coverage criteria, Runway 4/22 is not eligible to receive FAA funding. **Table 1-10** summarizes the wind data for both runways at BVS for all weather conditions combined (VFR and IFR).

TABLE 1-10: BVS WIND COVERAGE (ALL WEATHER)

Runway	12 MPH	15 MPH
10/28	98.9	99.39
4/22	95.6	97.70
Combined	99.5	99.5

Source: U.S. Department of Commerce National Weather Records Center (July 1948 to June 1951) at Mt. Vernon

Taxiways

Skagit Regional has an extensive taxiway system that provides access to all runway ends. Both runways are served by full-length parallel taxiways and additional taxiways located at each runway end connect all airside and landside facilities on the airfield. Most taxiways at BVS are in very good or excellent condition, with the exception of the Taxiway F, which was rated "poor" in the most recent (2005) pavement evaluation. The airport has extensive directional signage for the runway-taxiway system. **Table 1-11** summarizes existing taxiway facilities at BVS.

[11] Source: U.S. Department of Commerce National Weather Records Center (July 1948 to June 1951) at Mt. Vernon.

The parallel taxiways provide access to the aircraft parking areas, fueling, storage hangars, the terminal building, restaurant, fixed base operators (FBO), and several commercial hangars. Taxilanes have been added to provide access to hangar development areas on both sides of the airfield. The location and number of exit taxiways on both runways allow aircraft to efficiently move between the runways and parallel taxiways. Holding areas at both ends of Taxiway A allow aircraft to remain clear of the taxiway while conducting final preparations for takeoff or awaiting instrument flight plan clearances.

TABLE 1-11: TAXIWAY DATA (BVS)

Taxiway	Description	Dimensions/Configuration
Taxiway A	Parallel Taxiway Runway 10/28. *Note: Airport Facility Directory (AFD) indicates that NW 2,000' of Taxiway "...for ultralight use."*	Approximately 5,100 x 50' with four exit taxiways and aircraft holding areas at both runway ends. Asphalt surface; Medium Intensity Taxiway Edge Lighting (MITL); centerline stripe; aircraft hold lines at each runway connection.
Taxiway B	Connecting/Exit Taxiway at Runway 28 threshold (connects to Taxiway A)	Approximately 500 x 50' Asphalt surface; MITL; centerline stripe.
Taxiway C	Acute Angle Exit Taxiway (connects to Taxiway A and Runway 10/28)	Approximately 500 x 50' Asphalt surface; MITL; centerline stripe. Taxiway angle approximately 50 degrees (Rwy 10 direction), located approximately 3,500 feet from Runway 10 threshold.
Taxiway D	90-degree Exit Taxiway (connects to Taxiway A and Runway 10/28)	Approximately 438' x 50' Asphalt surface; MITL; centerline stripe. Taxiway located approximately 2,500 feet from Runway 10 threshold and 3,100 feet from Runway 28 threshold.
Taxiway F	Access Taxiway between Runway 10 and Runway 4 ends.	Approximately 5,742 x 50' Asphalt surface, centerline stripe.
Taxiway G	Parallel Taxiway Runway 4/22.	Approximately 3,000' x 35' with three 90-degree exit taxiways: #1 (at Rwy 22 end); #2 (mid-runway); #3 (at Rwy 4 end) Asphalt surface; Medium Intensity Taxiway Edge Lighting (MITL); centerline stripe; aircraft hold lines at each runway connection.
Other	Former west end of Runway 4/22 not designated as taxiway (connects Runway 4 end with Taxiway F) *Note: A/FD identifies this pavement as "stopway.""*	Approximately 1,850 feet (original runway width 150 feet) Asphalt surface, centerline stripe; yellow threshold markings (arrows) at Runway 4 end. Compass rose
T-Hangar Taxilanes	Taxilanes within T-hangar developments.	Dimensions vary (25 to 50 feet). Asphalt surface; Individual taxilanes between hangars.

The parallel taxiways are equipped with edge lighting. The parallel taxiway and exit taxiways have yellow centerline stripes. Aircraft hold lines are located on all taxiway connections to the runways. Yellow edge striping is located on some taxiway sections to define the taxiway from other adjacent pavement.

Aircraft Apron

Skagit Regional has six designated aircraft apron areas (A-F) with a total capacity of 106 parking spaces. **Table 1-12** summarizes existing apron facilities at the airport. Tiedown Aprons A-E (94 tiedown spaces) are located along the north side of Runway 10/28. Tiedown Apron F (12 spaces) is located near the end of Runway 4, adjacent to the T-hangar complex. A cargo apron is located near the midpoint of Runway 4/22 and is expected to accommodate commercial use. A new aircraft fueling area and FBO apron was added to the Runway 4/22 flightline in 2006. A small apron is also located on the east side of Taxiway F adjacent to an older hangar; the apron is not currently in use. The aprons are generally in very good or excellent condition with tiedown anchors, markings and taxilane centerlines. In general, it appears that pavement maintenance has been performed on a regular basis in recent years, which includes crack filling, vegetation removal and seal coating. The apron adjacent to Taxiway F was rated "very poor" in the 2005 pavement study.

TABLE 1-12: AIRCRAFT APRON DATA (BVS)

Tiedown Apron A	Current Use: Terminal building passenger loading/unloading, aircraft parking, light aircraft tiedowns, commercial hangar frontage, aircraft fueling (west end). Asphalt Concrete. Tiedowns: 14 single engine (10 transient); 2 twin engine; 3 turbine **Total: 19 spaces** (6 leased)
Tiedown Apron B	Current Use: Aircraft parking, hangar and FBO frontage, FBO operations, aircraft fueling (east end). Asphalt Concrete. Tiedowns: **Total: 20 single engine spaces** (18 leased)
Tiedown Apron C	Current Use: Aircraft parking, aircraft fueling (east end). Asphalt Concrete. Tiedowns: 14 single engine (6 transient); 2 twin engine **Total: 16 spaces** (8 leased)
Tiedown Apron D	Current Use: Aircraft parking. Asphalt Concrete. Tiedowns: **Total: 24 single engine spaces** (9 leased)
Tiedown Apron E	Current Use: Aircraft parking. Asphalt Concrete. Tiedowns: 9 single engine; 6 twin engine **Total: 15 spaces** (7 leased)
Tiedown Apron F	Current Use: Aircraft parking. Asphalt Concrete. Tiedowns: 10 single engine; 2 twin engine **Total: 12 spaces** (7 leased)
Commercial Cargo Apron *(near midpoint on Rwy 4/22)*	Current Use: Designated Air Cargo Area (future development) Asphalt Concrete. 6 aircraft tiedowns
FBO/Fueling Apron *(adjacent to Rwy 4/22)*	Current Use: Aircraft Parking and Fueling. Asphalt Concrete. (Not Rated; New in 2006)
Apron (Adjacent to Txy F)	Current Use: Unknown. Asphalt Concrete.


N4233C

Agricultural Aircraft Facilities

BVS does not currently accommodate locally based aerial applicators and there are currently no designated agricultural aircraft loading areas on the airport.

Airfield Pavement Condition

As part of the **Washington Aviation System Plan**, the Washington Department of Transportation Aviation Division manages a program of pavement evaluation and maintenance for Washington's general aviation airports.[12] This evaluation provides standardized pavement condition index (PCI) ratings, pavement features and current conditions. Through the use of MicroPAVER computer software, pavement condition ratings are periodically entered into the system with the specifics of each pavement section. The program is able to predict the future condition of the pavements if no maintenance action is taken, while also identifying the recommended measures needed to extend the useful life of the pavement section.

Table 1-13 summarizes airfield pavement conditions for BVS based on the most recent inspection conducted in April, 2005 and the 2015 forecast pavement condition. During the 2005 inspection, the majority of the airfield pavements at BVS were rated "excellent" or "very good." The area-weighted condition of BVS airfield pavements is 81 (very good), up from 78 in 1999. Runway 04/22 was rated "fair." Taxiway F was rated "poor" and the small apron adjacent to Taxiway F was rated "very poor." The west end of the original Runway 3/21 and parallel taxiway (now closed) are not rated. BVS has approximately 2.6 million square feet (SF) of airfield pavement, which equals approximately 60 acres of surface area.

An evaluation of the pavement on Runway 10/28 and Taxiway A was conducted in 2003 to determine strength and wheel load ratings. As noted earlier, the published pavement strength for Runway 10/28 is 19,000 pounds for aircraft with single wheel landing gear configurations. Non-destructing testing (falling weight deflectometer) was conducted along the centerline of the runway and Taxiway A at 100-foot intervals. Based on the updated field testing, several soft areas of pavement were identified, particularly near the end of Runway 28. Although the testing concluded that the overall rating for the runway could be increased to 40,000 pounds (single wheel) and 55,000 pounds (dual), the soft sections were rated at 20,000 and 24,000 pounds (single). The report indicated

[12] Skagit Regional Airport – 2005 Pavement Management Report (Applied Pavement Technology, Inc.) February, 2006

that some failures may occur in localized areas. A 2-inch asphalt overlay was suggested to overcome the pavement weakness in these areas. The runway's dual wheel rating was 55,000 pounds and dual-tandem rating was 90,000. Taxiway A had similar pavement ratings.

Based on currently available information, it appears that a short-term project will be required to perform limited repairs on the soft sections of Runway 10/28 and for the runway's transverse drains that have settled. An overlay of the entire runway will be required later in the 20-year planning period. Other projects identified during the 6-year pavement CIP include rehabilitation (3" overlay) for Runway 4/22, the connecting taxiways located at the Runway 22 end, and the holding area at the Runway 4 end; reconstruction (5" AC) of Taxiway F and the adjacent apron; and rehabilitation/reconstruction for two taxilanes located in the Runway 10/28 T-hangar area.

TABLE 1-13: SUMMARY OF AIRFIELD PAVEMENT CONDITION (APRIL 2005)

Pavement	Section Design/Age	2005 PCI Rating/Condition[1]	2015 Forecast PCI Rating/Condition[1]
Runway 10/28	2.5" AC w/ fabric (1989); 2" AC (1942); 4" Aggregate Base (1942); 6" Aggregate Subbase (1942)	84 / Excellent	70 / Very Good
Runway 4/22	2" AC (1942); 4" Aggregate Base (1942); 12" Aggregate Subbase (1942)	50-52 / Fair	45 / Fair
Taxiway A	2" AC w/ fabric (1990); 2" AC (1942); 1" AC Leveling (1942); 4" Aggregate Base (1942); 6" Aggregate Subbase (1942)	93 / Excellent	80 / Very Good
Taxiway A *(holding areas)*	2" AC (1991);4" Aggregate Base (1991); 9" Aggregate Subbase (1991)	Rwy 10 end: 96 Rwy 28 end: 98 Excellent	Rwy 10 end: 78 Rwy 28 end: 82 Very Good
Taxiway B	2" AC w/ fabric (1990); 2" AC (1942); 1" AC Leveling (1942); 4" Aggregate Base (1942); 6" Aggregate Subbase (1942)	93 / Excellent	80 / Very Good
Taxiway C	2-4" AC (1976-1992); 10" Aggregate Base (1976); 8" Aggregate Subbase (1976)	99-86 / Excellent-Very Good	85-73 / Excellent-Very Good
Taxiway D	3-5" AC (1988-1990); 9" Aggregate Base (1988)	100-79 / Excellent-Very Good	85-64 / Excellent-Good
Taxiway F	2" AC (1942); 4" Aggregate Base (1942); 6" Aggregate Subbase (1942)	34 / Poor	21 / Very Poor
Taxiway G *(east half)*	2" AC (1999); 4" Crushed Aggregate Base (1999); 7" Aggregate Subbase (1999); Soil Stabilizing Fabric (1999)	100 / Excellent	91 / Excellent
Taxiway G *(west half)*	2" AC (2003); 4" Crushed Aggregate Base (2003); 18" Aggregate Subbase (2003); Soil Stabilizing Fabric (2003)	100 / Excellent	91 / Excellent
Taxiway G *(Rwy 22 exit connection)*	2" AC (1942); 4" Aggregate Base (1942); 6" Aggregate Subbase (1942)	44 / Fair	32 / Poor
Taxiway G *(mid-rwy exit connection)*	2" AC (1943); 4" Aggregate Base (1943); 12" Aggregate Subbase (1943)	64 / Good	56 / Good
Tiedown Apron A	2-7" AC (1942-1992); 4-13" Aggregate Base (1942-1992); 9" Aggregate Subbase (1942-1992)	100-99 /Excellent	90-85 /Excellent
Tiedown Apron B	2" AC w/ fabric (1991); 1" AC Leveling (1991); 2" AC (1942); 4" Aggregate Base (1942); 6" Aggregate Subbase (1942)	97 /Excellent	85 /Excellent
Tiedown Apron C	2" AC w/ fabric (1991); 1" AC Leveling (1991); 2" AC (1942); 4" Aggregate Base (1942); 6" Aggregate Subbase (1942)	99 /Excellent	87 /Excellent
Tiedown Apron D	2-5" AC (1990-1991); 4" Aggregate Base (1990-1991); 8-9" Aggregate Subbase (1990-1991)	99-93 /Excellent	85-74 / Excellent-Very Good

Tiedown Apron E	2" AC (1992); 4" Aggregate Base (1992); 9" Aggregate Subbase (1992)	99-98 / Excellent	85-82 / Excellent-Very Good
Tiedown Apron F	2" AC (1999); 4" Aggregate Base (1999); 7" Aggregate Subbase (1999); Soil Stab. Fabric (1999)	100 / Excellent	90 / Excellent
South T-Hangar Taxilanes *(Rwy 4/22 - east end)*	2" AC (1999); 4" Aggregate Base (1999); 7" Aggregate Subbase (1999); Soil Stabilizing Fabric (1999)	100 / Excellent	91 / Excellent
North Hangar Taxilanes	2" AC (typ.); 4" Aggregate Base; 9" Aggregate Subbase (1991-1993)	99-43 / Excellent-Fair	91-30 / Excellent-Poor
West T-Hangar Taxilanes *(Rwy 4/22 west end)*	2" AC (2003); 4" Aggregate Base (2003); 7" Aggregate Subbase (2003); Soil Stabilizing Fabric (2003)	100 / Excellent	91 / Excellent
Air Cargo Apron	2" AC (2003); 4" Aggregate Base (2003); 7" Aggregate Subbase (2003); Soil Stabilizing Fabric (2003)	94 / Excellent	75 / Very Good
Taxiway F Apron	2" AC (1942); 4" Aggregate Base (1942); 6" Aggregate Subbase (1942)	17 / Very Poor	10 / Very Poor

1. The Pavement Condition Index (PCI) scale ranges from 0 to 100, with seven general condition categories ranging from "failed" to "excellent." For additional details, see *Washington Aviation Pavement Management Program for Skagit Regional Airport*.

LANDSIDE FACILITIES

Hangars and Airport Buildings

Aviation-related buildings on the airport include conventional hangars, executive hangars, T-hangars, the airport terminal building and several buildings accommodating a variety of commercial activities. There are approximately 88 hangar spaces located in five Port-owned T-hangars and three privately owned T-hangars. In addition, several executive hangars and conventional hangars are used for aircraft storage, maintenance, or commercial aviation activities.

The terminal building houses a passenger waiting area, restrooms, airline lease space, and Port administrative offices. The terminal building currently has approximately 375 square feet of passenger waiting area and airline ticket counter and approximately 390 square feet of airline office space available. The Port offices total approximately 7,400 square feet.

An airport restaurant is located east of the terminal building. Federal Express is also located in the same building. Existing airport buildings are summarized in **Table 1-14.**

TABLE 1-14: AIRPORT BUILDINGS

Building	Existing Use	Port Owned	Estimated Useful Life Remaining	Year Constructed
T-Hangar "A" (10-units) *(north hangar area)*	Aircraft Storage	Yes	< 10 years	1972
T-Hangar "B" (12-units) *(north hangar area)*	Aircraft Storage	Yes	< 10 years	1976
T-Hangar "C" (12-units) *(north hangar area)*	Aircraft Storage	Yes	< 10 years	1983
T-Hangar "D" (12-units) *(north hangar area)*	Aircraft Storage	Yes	< 20 years	1990
T-Hangar "E" (12-units) *(north hangar area)*	Aircraft Storage	Yes	< 20 years	1991
Restroom *(located at west end of T-hangar A)*	Public Restroom	Yes	>20 years	1995
"Methow" Conventional Hangar	Air Cargo, Aircraft Storage	Yes	< 20 years	1990
"Bayview Executive" Conventional Hangars (6 units)	Aircraft Storage	No	>20 years	2005-06
"Pioneer Aerofab Mfg."	Aviation Related Commercial	No	>20 years	1998
Former "Chuckanut Bldg. LLC" Conventional Hangar (3 units)	Aircraft Storage	No	>20 years	1998
Former "Chuckanut Aviation" Conventional Hangar/Office	Aircraft Storage	Yes	>20 years	1964
"Padilla Limited Partnership" Conventional Hangar	Aircraft Storage	No	>20 years	1995
"Chuckanut Group" Conventional Hangar	Aircraft Storage	Yes	>20 years	1975
"Sound Aircraft" Conventional Hangar	Aircraft Maintenance	Yes	>20 years	1972
Fuel Station *(located adjacent to Tiedown Apron A and C)*	Fueling Systems	Yes	< 20 years	1967
Terminal Building	Passenger Facilities, Restrooms, Port Administration Offices, Tenant Office and Operations Areas, Pilot & Passenger Waiting Area	Yes	>20 years	1978
Equipment Garage (Fire Truck) *(east of terminal bldg.)*	ARFF Truck Storage	Yes	>20 years	1997
Commercial Building (Restaurant, FedEx, Flight School)	Airport and Aviation Related Commercial	No	>20 years	1993
"Corporate Air" Conventional Hangar/Office	FBO, Aircraft Maintenance and Storage	No	>20 years	1999
"South" Executive Hangar #1 (4 units) *(east end near Rwy 22)*	Aircraft Storage	No	>20 years	2001
"South" T-Hangar #1 (10-units) (east end) *(east end near Rwy 22)*	Aircraft Storage	No	>20 years	2001

TABLE 1-14: AIRPORT BUILDINGS (continued)

"South" T-Hangar #2 (10-units) *(east end) (east end near Rwy 22)*	Aircraft Storage	No	>20 years	2001
"South" Executive Hangars #2 (4 units) *(east end) (east end near Rwy 22)*	Aircraft Storage	No	>20 years	2001
Conventional Hangar *(adjacent to Taxiway F)*	Not Currently in Use	Yes	< 20 years	1985
Port Maintenance Building	Equipment Storage, Shop	Yes	>20 years	1940s
Civil Air Patrol	Operations	No	>20 years	1940s
"Via Jet" Conventional Hangar *(located near end of Rwy 4)*	FBO	No	>20 years	2005
"T-hangar" (10 units) *(located near end of Rwy 4)*	Aircraft Storage	No	>20 years	2005
Runway 10/28 Fuel Island	Fueling Facilities	Yes	>20 years	2005
Runway 4/22 Fuel Island	Fueling Facilities	Yes	>20 years	2005

Airport Lighting

BVS accommodates day and night operations in both visual and instrument flight rules (VFR/IFR) conditions. **Table 1-15** summarizes the types of airport lighting currently used at BVS.

TABLE 1-15: TYPES OF AIRPORT LIGHTING USED AT BVS

Category	Type
Airfield Lighting	Airport Rotating Beacon (white/green dual lenses)
Runway Lighting	Runway Edge Lighting (white lenses), Threshold Lighting (red/green lenses), REIL
Visual Guidance Indicators	PAPI, VASI (red/white lenses)
Taxiway Lighting	Taxiway edge lighting (blue lenses)
Other Lighting	Obstruction lights (on wind sock, AWOS, antennae, etc.), lighted wind cones, lighted segmented circle, lighted airport signage; flood lighting in hangar, fuel areas.

The airport rotating beacon is mounted on a tower, east of the terminal area in the adjacent airport industrial park. Since the last master plan was completed, the beacon was relocated from a location near the terminal building to improve visibility and to address height restrictions. Obstruction lights are located on several facilities in the immediate vicinity of the airfield, including the antennas for the non-directional beacon (NDB), a windsock located adjacent to Runway 10/28, and the AWOS.

Runway 10/28 has medium intensity runway lighting (MIRL) with visual approach slope indicators (VASI) on both ends. The VASI on Runway 10 is FAA owned and the Runway 28 VASI is Port owned. Runways 10 and 28 are both equipped with runway end identifier lights (REIL), which consist of two high-intensity sequenced strobe lights that mark the end of the runway. For instrument runways without an approach lighting system, REILS assist pilots in establishing visual contact with the runway environment during periods of darkness or reduced visibility.

Runway 10/28 is equipped with lighted distance remaining signs and extensive lighted directional/informational signage.

Runway 4/22 has medium intensity runway lighting (MIRL) with precision approach path indicators (PAPI) on both ends. PAPIs are the current standard visual guidance indicator system for general aviation runways.

The parallel taxiways serving both runways are equipped with edge lighting; other access or hangar taxiways are equipped with reflective edge markers. Taxiway A, the parallel taxiway for Runway 10/28, has medium intensity taxiway lighting (MITL); Taxiway G, the parallel taxiway for Runway 4/22 has medium intensity taxiway lighting (MITL).

Airport facility directory information indicates that pilots activate both runway edge lighting systems, and the REILs and VASI on Runway 10 through the CTAF (123.05 MHz). The PAPI for Runways 4 and 22 are operated continuously. The airport beacon and lighted wind cone operate on dusk-dawn automatic switches.

Overhead lighting is available in the terminal area, fueling area, and adjacent to most aircraft hangars. **Table 1-16** summarizes existing airport lighting at BVS. All airfield lighting observed during recent site visits appeared to be in good condition and operational.

TABLE 1-16: AIRPORT LIGHTING

Component	Type	Condition
Runway Lighting	Runway 10/28: Medium Intensity Runway Edge Lighting (MIRL); Threshold Lights (pilot – radio activated)	Good
	Runway 4/22: Medium Intensity Runway Edge Lighting (MIRL); Threshold Lights (pilot – radio activated); Reflective Distance Remaining Signs	Good
Taxiway Lighting	Taxiway A (10/28 parallel): Medium Intensity Taxiway Edge Lighting (MITL) Taxiway G (4/22 parallel): Medium Intensity Taxiway Edge Lighting (MITL)	Good
Lighted Airfield Signage	Mandatory, Location, Directional, Destination and Distance Remaining Signs.	Good
Runway Approach Lighting	None	N/A
Visual Guidance Indicators	VASI (pilot – radio activated) Rwy 10: (4-box unit) 3 degree glide path Rwy 28: (2-box unit) 3.5 degree glide path PAPI (operates continuously) Rwy 4: (P2L) 3 degree glide path Rwy 22: (P2L) 3 degree glide path	Good
Other Runway Lighting	REIL (Rwy 10 & 28) (pilot – radio activated)	Good
Airport Lighting	Airport Rotating Beacon; Lighted Wind Cones (1)	Good

NAVIGATIONAL AIDS AND AIRSPACE

The airport has three published non-precision instrument approaches, including two global positioning system (GPS) procedures and one non-directional beacon (NDB) procedure.

Note: in 2006, the GPS approach for Runway 28 was (temporarily) removed from service by FAA due to an "uncharted obstruction." Once the obstruction is surveyed, the appropriate disposition (e.g., removal or marking/lighting) can be determined and the instrument approach may be reauthorized or replaced.

All of the instrument approaches are authorized for category A-D aircraft, with varying approach minima for both straight-in and circling procedures. A description of existing instrument approaches is provided below and the approach procedures are depicted in **Figure 1-4**. Specific detail about the individual instrument procedures is also provided to support technical evaluations later in the master plan to determine what level of improvement may be desired in approach capabilities. This information is primarily of interest to instrument-rated pilots and the FAA for purposes of airspace planning.

The Skagit/Bayview (Identifier: BVS) NDB is located on the airport, in the infield area between the runways. The NDB is owned and maintained by the Port. Several VOR[13] based navigational aids are located within 35 miles of the airport, which support nearby enroute air navigational routes. These are the Paine VOR/DME, Penn Cove VOR/DME, and the Whatcom VORTAC.

BVS has an automated weather observation system (AWOS-3) that provides 24-hour weather data, which supports both VFR and IFR operations. The AWOS-3 is located in the infield area between the airport's two runways. The AWOS-3 provides altimeter setting, wind data, temperature, dew point, density altitude, visibility, and cloud/ceiling data.

Table 1-17 summarizes existing navigational aids and related items **Figures 1-4A and 1-4B** depict the currently published instrument procedures at BVS.

[13] Very high frequency Omnidirectional Radiorange (VOR)

TABLE 1-17: NAVIGATIONAL AIDS AND RELATED ITEMS

Type	Facilities
Electronic Navigational Aids	Skagit/Bayview (BVS) Non-directional Beacon (NDB) 240 LHz (located on field) Paine VOR/DME (33 nm SSE) 110.6 MHz Penn Cove VOR/DME (18.5 nm SW) 117.2 MHz Whatcom VORTAC (29 nm NNW) 113.0 MHz
Instrument Approaches	NDB Rwy 10; RNAV (GPS) Rwy 10 GPS Rwy 28 *(temporarily not authorized)*
Weather Observation	AWOS-3 on Field (121.125 MHz)
Communication	Unicom/Common Traffic Advisory Frequency (CTAF)(123.05 MHz) Whidbey Radar Approach/Departure Control (120.7 MHz)

RNAV (GPS) – Runway 10

Note: This RNAV (GPS) approach was commissioned in August 2006 and the previous GPS – Rwy 10 approach was cancelled.

BVS has a straight-in RNAV (GPS) approach to Runway 10 with an inbound course of 105 degrees that routes aircraft directly to a missed approach point (MAP) at the end of Runway 10. The RNAV (GPS) Runway 10 approach also has a "circling" procedure authorized, allowing aircraft to land on any runway upon establishing and maintaining visual contact with the airport environment.

The initial approach fix (IAF) is located approximately 12.9 nautical miles from the end of Runway 10; the IAF altitude for the procedure is 3,900 feet above mean sea level (MSL). The minimum descent altitude (MDA) for both the straight-in procedure is 497 feet MSL (353 feet AGL). The minimum visibility requirements range from 1 ¼ mile to 1 ½ miles for the straight-in procedure and 1 ¼ to 2 miles for the circle-to-land, depending on the aircraft approach category. The straight-in procedure has a 3.00-degree vertical navigation (VNAV) descent path established between the initial approach fix (IAF) (SOCLO waypoint) and the missed approach point.

The missed approach procedure directs pilots to climb to 5,000 feet MSL direct to the HOSVA waypoint; turn right via 196-degree track to the KIKYE waypoint; turn right via 278-degree track to the ISLND waypoint and hold above the waypoint at 5,000 feet.

Global Positioning System (GPS) – Runway 28 *(Temporarily Not Authorized)*

Note: This GPS approach was temporarily suspended by FAA in 2006 due to an "uncharted obstruction" and is not currently available.

BVS has a straight-in GPS approach to Runway 28 with an inbound course of 286 degrees that routes aircraft directly to a MAP at the end of Runway 28. The GPS Runway 28 approach also has a "circle-to-land" procedure authorized.

The initial approach fix (IAF) is located approximately 10 nautical miles from the end of Runway 28; the IAF altitude is 3,100 feet MSL. The MDA for the straight-in procedure is 600 feet MSL (478 feet AGL); the MDA for the circle-to-land procedure ranges from 620 feet to 700 feet MSL (476 to 556 feet AGL), depending on the aircraft approach category. The minimum visibility requirements range from 1 mile to 1-1/2 miles for the straight-in procedure and 1 mile to 2 miles for the circle-to-land, depending on the aircraft approach category.

The straight-in procedure has a 3.3-degree VNAV descent path established between the FAF (TUCHY waypoint) and the end of Runway 28 (missed approach point).

The missed approach procedure directs pilots to climb to 4,000 feet MSL on 285-degree course to AGAFI waypoint and enter a holding pattern above the waypoint.

Non-Directional Beacon (NDB) – Runway 10

An NDB approach is authorized as both a straight-in procedure on Runway 10 and a "circle-to-land" procedure. The final approach course is 112 degrees, with the MAP located directly over the NDB. The missed approach procedure directs pilots to climb outbound on the 112 degree bearing to 2,100 feet MSL, before proceeding with a climbing right turn to 3,000 feet, direct to the BVS NDB, where they are to enter a holding pattern above the NDB.

The MDA for both the straight-in and circle-to-land procedure is 1,240 feet MSL (1,096 feet AGL) with minimum visibility requirements ranging from 1-1/4 miles to 3 miles, depending on the aircraft approach category.

Figure 1-5 depicts the airspace structure in the immediate vicinity of BVS. **Table 1-18** summarizes notable obstructions, special airspace designations and IFR routes in the vicinity of BVS, as identified on the Seattle Sectional Aeronautical Chart and the IFR Enroute Low Altitude Chart (L-1). The local airport traffic pattern altitude is 1,144 feet above mean sea level (MSL) with standard left

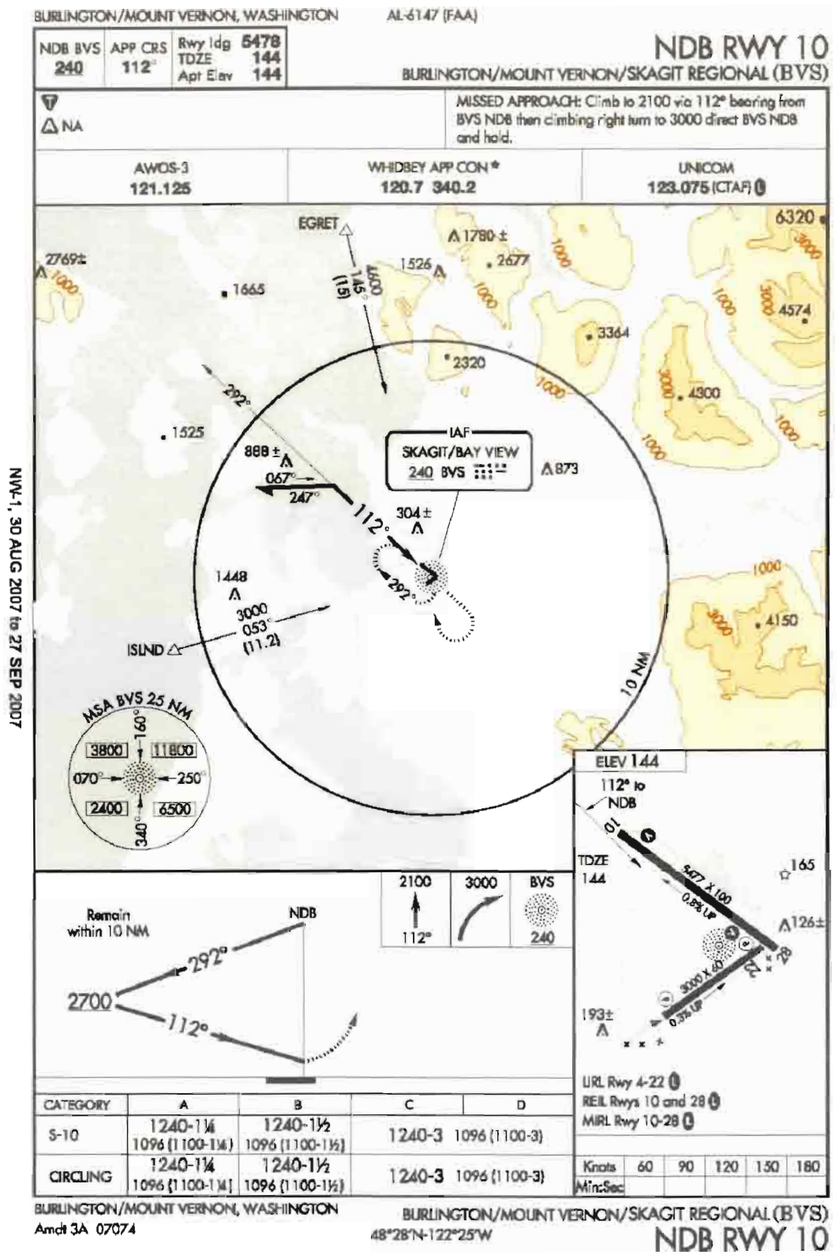
traffic. As noted in the previous table, BVS is located in an area of Class E airspace with floor 700 feet above ground level; there is no mandatory radio communication required for visual flight rules (VFR) operations in Class E airspace, although pilots are encouraged to use the common traffic advisory frequency (CTAF) when operating at the airport. Local airport operations and flight activity is not affected by the noted airspace or obstructions charted in the vicinity of the airport.

Local Airspace/Terrain Conditions

The area surrounding the airport consists mostly of open land in agricultural use with scattered areas of development along the Highway 20 corridor south of the airport. The 1995 airspace plan depicts ultimate precision instrument approach capabilities for both ends of Runway 10/28 and visual approaches for Runway 3/21 (now 4/22). No areas of terrain penetration were depicted on the drawing, although the full length of the Runway 10 and 28 approach surfaces were not depicted on the plan view of the airspace plan. An accompanying 1995 approach profile drawing for Runway 10/28 identifies areas of high terrain located just below the outer 40:1 approach surface sections for both Runway 10 and 28. The updated airspace plan will depict the profile of terrain located along the entire length of each runway's approach surfaces. Terrain found to penetrate any surface will be depicted on the drawing and noted in the drawing's obstruction table.

A 1997 obstruction survey was conducted for BVS in preparation of an Airport Obstruction Chart (OC).[14] The OC depicts both nonprecision and precision approach surfaces for Runway 10, but only visual surfaces for Runways 28, 4, and 22. The OC depicts several penetrations (primarily trees, fences) within the Runway 10 approach surface and the primary surface for Runway 10/28, although the majority of tree penetrations are located in the runway transitional surfaces and horizontal surface, northwest of the runways, within the horizontal surface. Despite being somewhat dated (1997), the data generated through the OC survey is the most comprehensive obstruction data available and it is appropriate for use in the updated airspace plan drawing. Updated obstruction surveys may be required in the future to precisely evaluate clearance requirements for specific projects.

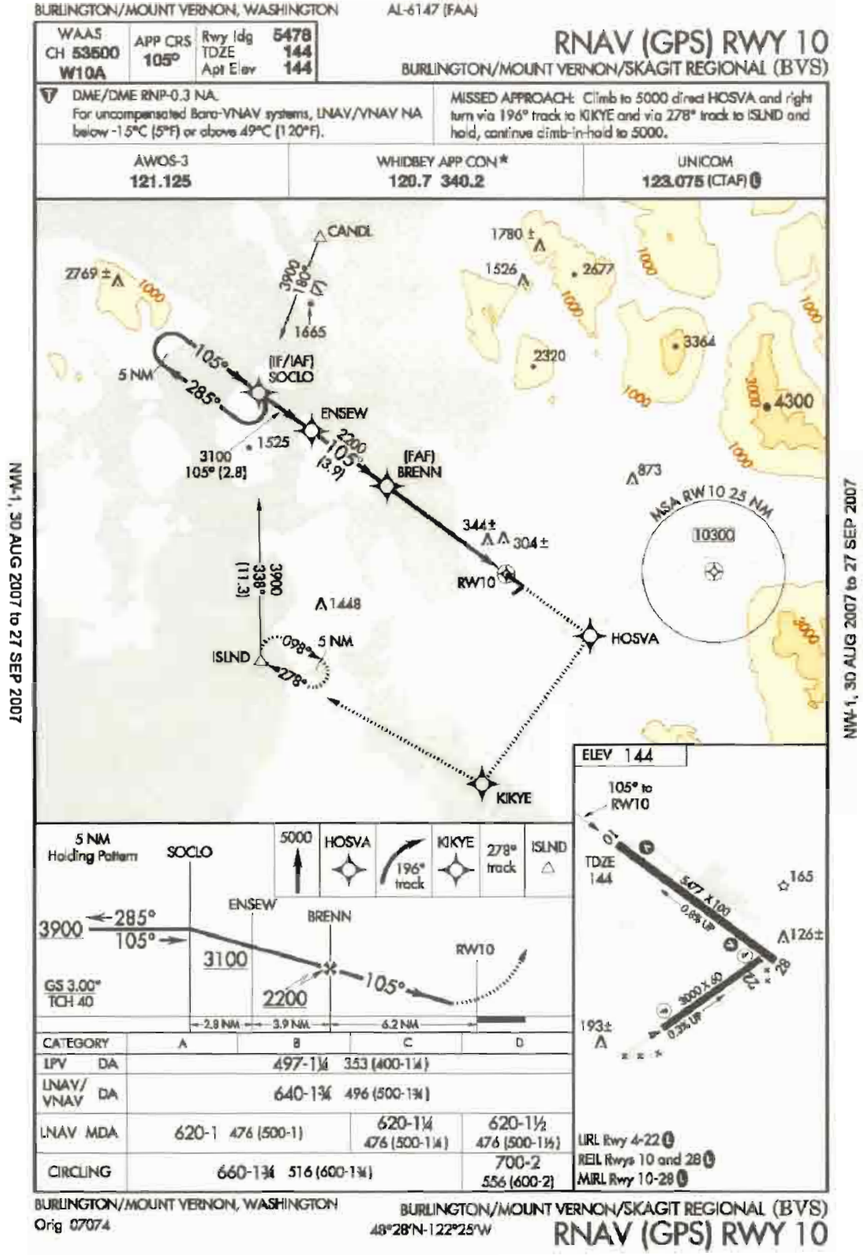
[14] Airport Obstruction Chart, National Ocean Service (NOS), U.S. Department of Commerce (Field Survey June 1997; Published June 1999)



NW-1, 30 AUG 2007 to 27 SEP 2007

NW-1, 30 AUG 2007 to 27 SEP 2007

NDB RUNWAY 10



NW-1, 30 AUG 2007 to 27 SEP 2007

NW-1, 30 AUG 2007 to 27 SEP 2007

RNAV (GPS) RUNWAY 10

PORT OF SKAGIT COUNTY

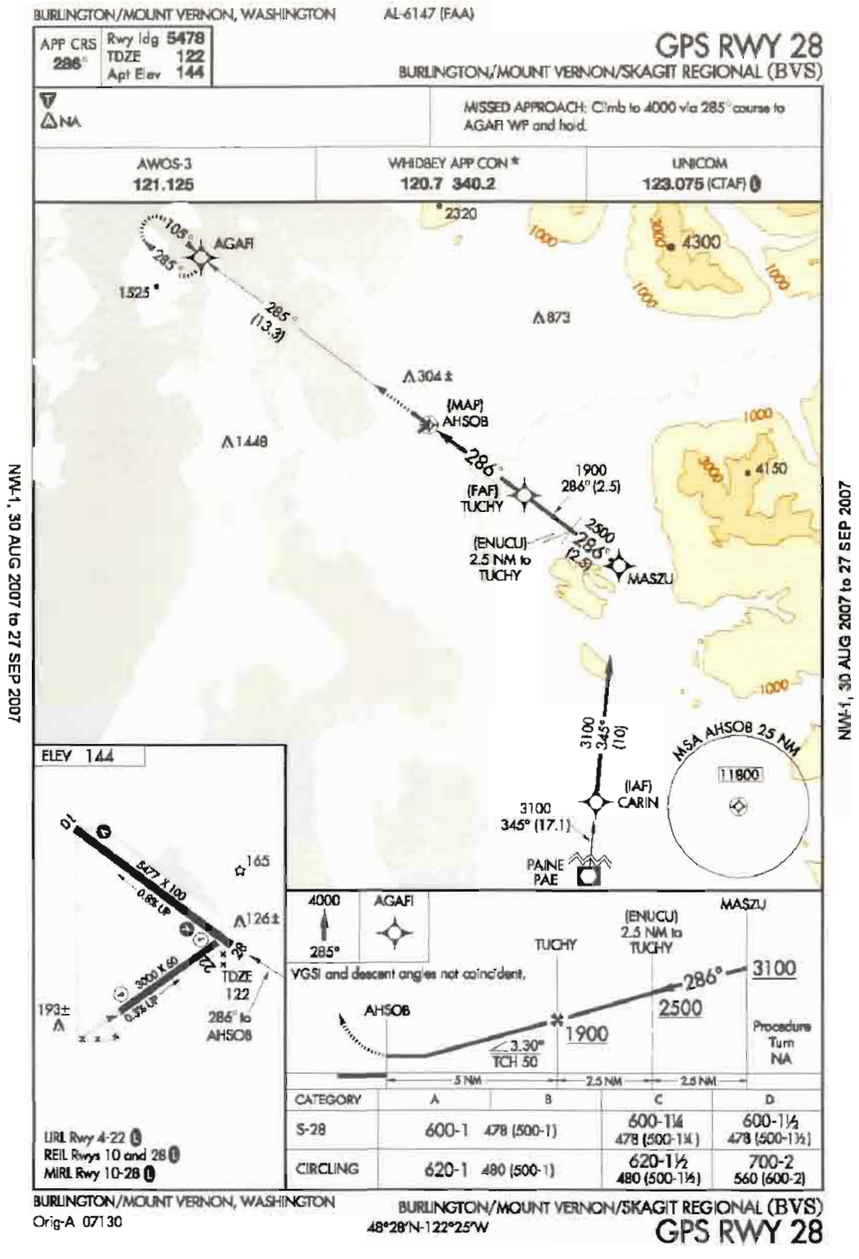
CENTURY WEST ENGINEERING CORPORATION

DAVID EVANS AND ASSOCIATES INC

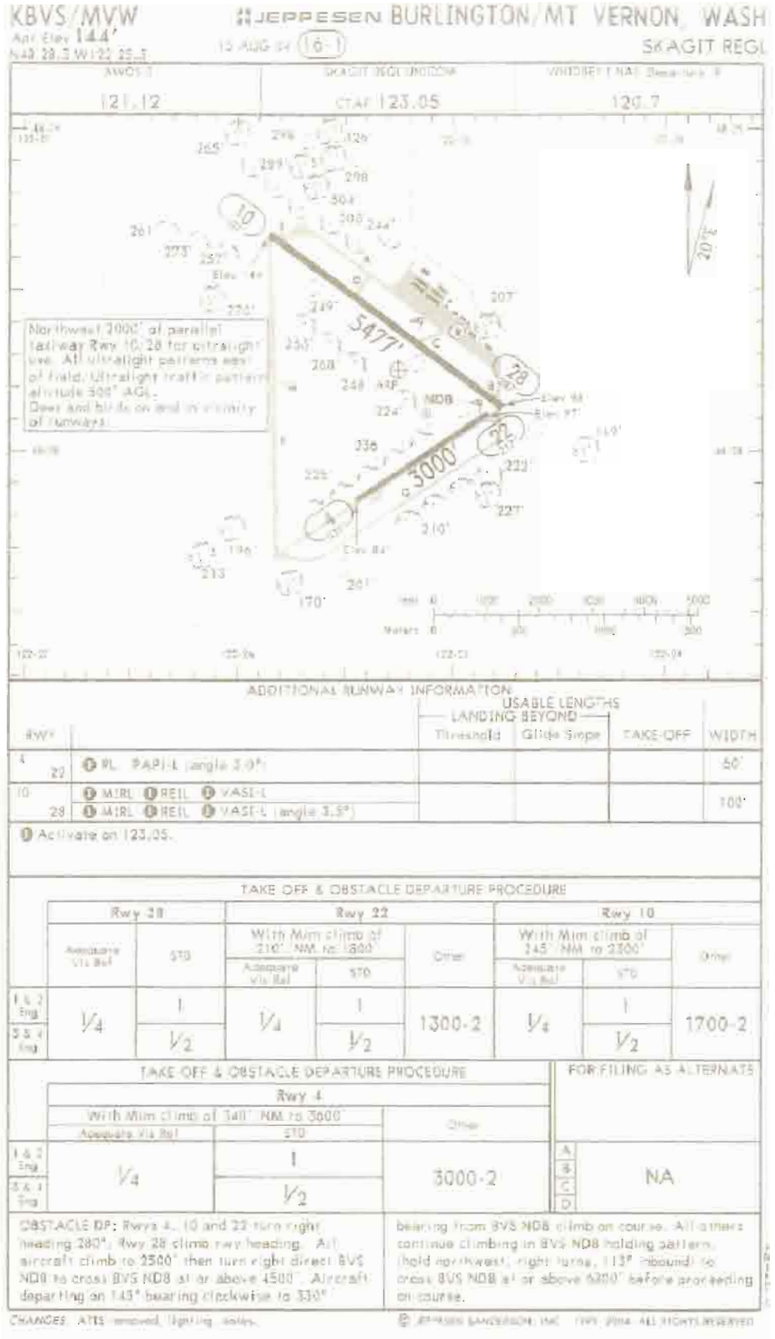
INSTRUMENT PROCEDURES

SKAGIT REGIONAL AIRPORT
AIRPORT MASTER PLAN

FIGURE
1-4A



GPS RUNWAY 28



AIRPORT SKETCH

PORT OF SKAGIT COUNTY
CENTURY WEST ENGINEERING CORPORATION
DAVID EVANS AND ASSOCIATES INC

INSTRUMENT PROCEDURES

SKAGIT REGIONAL AIRPORT
AIRPORT MASTER PLAN

FIGURE
1-4B

N

NOT TO SCALE

PORT OF SKAGIT COUNTY

CENTURY WEST ENGINEERING CORPORATION

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AREA AIRSPACE

FIGURE

1-5

SKAGIT REGIONAL AIRPORT
AIRPORT MASTER PLAN

TABLE 1-18: AIRSPACE/INSTRUMENT ROUTES/ LOCAL OBSTRUCTIONS

Airspace Item	Description	Location
Low Altitude Enroute Airway	Victor 23 – 4,500 feet mean sea level minimum enroute altitude (MEA).	.5 nautical miles west. Connects Whatcom and Paine VORTACs on a 149-329 degree course.
Low Altitude Enroute Airway	Victor 165 – 5,000 feet mean sea level MEA; 1,500/2,800 feet mean sea level minimum obstruction clearance altitude (MOCA)	10 nautical miles west. Connects Whatcom and Penn Cove VORTAC on a 349-168 degree course.
Class C Airspace	Associated with Whidbey Island NAS (operational control tower). Airspace segments with varying floor altitudes ranging from surface to 2,000 feet MSL; ceiling at 4,000' MSL. Requires prior two-way radio communication to enter during VFR conditions. Whidbey Approach /Departure Control (east section) - 120.7 MHz	1 nautical mile southwest of BVS North section of outer 5 mile ring: 2,000' MSL floor; 4,000' ceiling Remainder of outer 5 mile ring: 1,300' MSL floor; 4,000' ceiling Inner section (10 NM diameter): Surface to 4,000' MSL
Class E Airspace	Associated with low altitude federal airways and instrument procedures (floor is 700 feet above ground surface)	Directly over airport, extends 15 NM east and beyond in all other directions over the entire Puget Sound area.
Padilla Bay Refuge	National Wildlife Refuge. VFR aircraft requested to maintain a minimum altitude of 2,000 feet above the surface.	2 miles west
Towers	Single 270-foot (AGL) Tower Group of Towers 203 feet AGL	3-4 miles southeast
Tower	Single 313-foot (AGL) Tower	6.5 miles northeast
Smoke Stacks	Group of Stacks 250 feet AGL	5 miles west
Towers	Group of Towers 1,448 feet ***MSL***	8 miles west

Because Runways 10/28 and 4/22 do not intersect, a runway visibility zone (RVZ) is not required by FAA standards. However, since the ends of Runway 28 and 22 are in very close proximity, maintaining line of sight clearances consistent with the RVZ criteria would be prudent and is recommended. This area should be free of obstructions to provide adequate line of sight visibility between the two runways. The 1995 airport layout plan depicts a RVZ that extends from the ends of Runway 28 and 22 to the midpoints of each runway. No incompatible development exists within the RVZ. The RVZ has been cleared and is regularly mowed.

AIRPORT SUPPORT FACILITIES/SERVICES

Aircraft Fuel

BVS has both aviation gasoline (AVGAS) and jet fuel (Jet A) available for sale. **Table 1-19** summarizes existing fuel facilities on the airport, which includes a combination of fixed-location tanks and mobile fuel trucks. Card lock fueling (AVGAS only) is available at the fixed tank location, adjacent to Runway 10/28; the majority of jet fuel is dispensed by truck.

TABLE 1-19: AVIATION FUEL STORAGE (BVS)

Storage Type	Location/Facilities
Fuel Tanks	Adjacent to Runway 10/28: Underground 12,000 gallon tank (AVGAS) (port owned) Underground 12,000 gallon tank (Jet-A) (port owned) Card Lock System New Aircraft Fuel Farm (located near west end of flightline); Tanks to be added in future Adjacent to Runway 4/22: *Temporary FBO-owned Aboveground 12,000 gallon w/ Card Lock System Removed in 2006* New Aircraft Fuel Farm (located near west end of flightline); Tanks to be added in future
Fuel Trucks	Corporate Air (FBO) #1 – 3,000 gal. Jet A #2 - 750 gal. AVGAS

In Spring 2005, an airport fuel study[15] recommended development of consolidated bulk fuel storage areas on the flightlines adjacent to Runway 10/28 and 4/22. In 2006, new fuel storage areas were constructed on both flightlines; the areas were designed to accommodate multiple above ground storage tanks for both AVGAS and jet fuel. Card lock fueling will be available at both locations for AVGAS. Mobile fuel trucks will continue to be used by the airport's fixed base operators (FBO) for fueling around the airport. The Port's existing underground tanks will be decommissioned at the end

[15] Skagit Regional Airport Fuel Study (David Evans & Associates; Century West Engineering, 2005)

of their current lease. The temporary aboveground fuel tank previously located near the end of Runway 22 was removed in 2006 after Chuckanut Aviation ceased their FBO operations.

Surface Transportation Data

Surface access is provided to Skagit Regional via U.S. Interstate (I-5), State Route 20 (SR20), Skagit County public roads and several Port-owned and maintained roads. I-5 is the main north south Interstate Highway serving the west coast. It is a major freight and goods corridor serving coastal cities from Canada to Mexico. Two I-5 interchanges are easily accessible from the airport. They include an interchange at SR20 (Exit 230) and at Josh Wilson Road (Exit 231). SR20 connects with I-5 approximately 3-1/2 miles east of the airport. A major widening of SR20 from SR 536, west of the airport, to I-5 is proposed by WSDOT. This project is to be advertised in 2006, with a construction cost of approximately $70 million dollars and a 2-3 year completion period. SR20, between Burlington and Anacortes carries an estimated 10 million tons of freight transported annually.[16] Josh Wilson Road, a Skagit County major collector, provides access to I-5 from the north end of the airport. This road does not handle the same volume of freight traffic as SR20, but does accommodate over 4,000 ADT (Average Daily Trips).

Higgins Airport Way, the south end of which is a Skagit County maintained road, connects the airport property with both SR20 and Josh Wilson Road. The Higgins Airport Way and SR20 intersection is not signalized and is currently at Level of Service (LOS) D.[17] Outbound traffic often experiences delays with left turns. Channelization improvements to this intersection are planned in the aforementioned WSDOT SR20 widening project.

Higgins Airport Way continues north through the airport to Josh Wilson Road connecting at a point approximately 3.7 miles from I-5. Higgins Airport Way serves the terminal area, provides landside access to the Runway 10/28 facilities, and the Bayview Business and Industrial Park. Several Port-owned roads provide local access to the Runway 4/22 facilities and circulation through the industrial park.

Skagit Transit (SKAT) provides limited transit service through the county. The airport is not currently accessible by any SKAT routes. A BNSF railroad spur line follows the north margin of

[16] Skagit County Transportation Systems Plan, June 2003. Prepared by Skagit County Public Works, Otak, Inc. and KDD Associates.

[17] Bayview Ridge Subarea Plan, January 2004. Prepared by Reid Middleton.

SR20 from Interstate 5 to the City of Anacortes. This rail line is approximately 1-1/4 miles south of the airfield.

In 2006, a new internal access road was constructed around the end of Runway 28 to provide controlled vehicle access (airport fuel trucks, maintenance vehicles, etc.) between the two flightlines. The road is located outside of all protected areas associated with the runway-taxiway system; vehicles traveling on the roadway do not obstruct the Runway 28 approach surface.

Fencing

Fencing at the airport consists of newer sections of chain link in the terminal area and adjacent developed areas with electronic keypad vehicle gates located at key access points in the apron and hangar area. Beyond the terminal area, the majority of the airport perimeter is fenced with three or four strand wire fencing.

Utilities

Skagit Regional is served by multiple utility providers. These purveyors include Skagit Public Utility District No. 1, the City of Burlington, and Puget Sound Energy.

Water service is provided by Skagit Public Utility District No.1 (Skagit P.U.D.). A sixteen-inch diameter water main serves the airport from SR20, an eight-inch diameter water main from Peterson Road, and a 12-inch diameter water main from Josh Wilson Road. The Port of Skagit has installed 8- and 12-inch diameter water mains for distribution throughout the Bayview Business and Industrial Park and the terminal areas. This allows for adequate fire flow for most typical industrial uses. The airport and airport's tenants are individually metered by Skagit P.U.D.

The ownership and maintenance of the airport's sanitary sewer system was taken over by the City of Burlington Department of Public Works in 2000. The City now provides sewer service through a combination of gravity sewer mains and sanitary sewer lift stations to all of the developed areas of the airport. In 1995, the City had a facility plan prepared that outlined capacity problems in the City's system. Since that time the City has completed all of the identified projects totaling more than $18M and has solved all known issues.

Stormwater runoff from the airport is tributary to Skagit County Drainage District 19 and Dike District 12.[18] These areas are located either within or adjacent to the Skagit River floodplain. A Stormwater Management Master Plan was prepared in 1998, which inventoried the existing system, identified areas of concern, and developed a Capital Improvement Plan. The Port has acted on several of the recommendations from the C.I.P.

Electrical power and natural gas are provided to the developed regions of the airport by Puget Sound Energy (PSE).

Public telephone and restrooms are located in the airport terminal building; a second public restroom is located adjacent to T-hangar "A", near the west end of the terminal area.

LAND USE PATTERNS AND PLANS

VICINITY LAND USE/ LAND USE CONTROLS

Skagit Regional Airport is located entirely within the Bayview Ridge Subarea, a 4,011-acre Subarea located on a topographic bench above the Skagit River floodplain. The Subarea includes 3,633 acres located within an Urban Growth Area (UGA) and an additional 378 acres located in urban and rural reserve tracts at the fringe of the UGA. The Subarea is surrounded by agricultural lands, pastureland, and scattered rural residential housing. Within the Subarea, land uses consist of the airport and related facilities, industrial/business development, pastureland, and residential housing. A summary of existing land uses in the Bayview Ridge Subarea is provided in **Table 1-20**. **Figure 1-6** depicts the land use designations in the vicinity of the airport.

[18] Stormwater Management Master Plan, October 1998, Prepared by David Evans and Associates, Inc.

TABLE 1-20: BAYVIEW RIDGE EXISTING LAND USE

Use	Total Acreage
Skagit Regional Airport (Airfield)	761
Industrial Development	601
Commercial Development	0
Residential Development	494
Wetlands/Buffers	1,023
Vacant, Developable Land	1,123
Total	**4,011**

Source: Draft Bayview Ridge Subarea Plan

Currently, industrial facilities are primarily located within the Bayview Business and Industrial Park (BBIP), on the eastern side of the airport. The Skagit County Solid Waste Transfer Station, designated an essential public facility, is located southwest of the airport. The Paccar Technical Center is located directly west of the airport and adjoins the Port's property. The Puget Sound Energy Tank Farm and Olympic Pipeline Tank Farm are located adjacent to the Port's property, directly south of Runway 4/22.

Areas east of the airport and industrial park support industrial land, the Skagit Golf and Country Club, and surrounding residential development with urban levels of density. Areas north and west of the airport support scattered rural residences and pastureland. Agricultural lands are located southeast of the airport along Highway 20, outside of the Subarea boundaries.

The area is considered ideal for future urban growth based on the existing urban-density residential and industrial development, as well as the extensive infrastructure that already services the area. A network of state and local roads, railways, and the Skagit Regional Airport provide access to the Subarea. Extensive electrical transmission lines run along Highway 20, south of the Subarea. Public water service is provided by Skagit P.U.D. for the majority of the Subarea. The City of Burlington provides sewer service to the area.

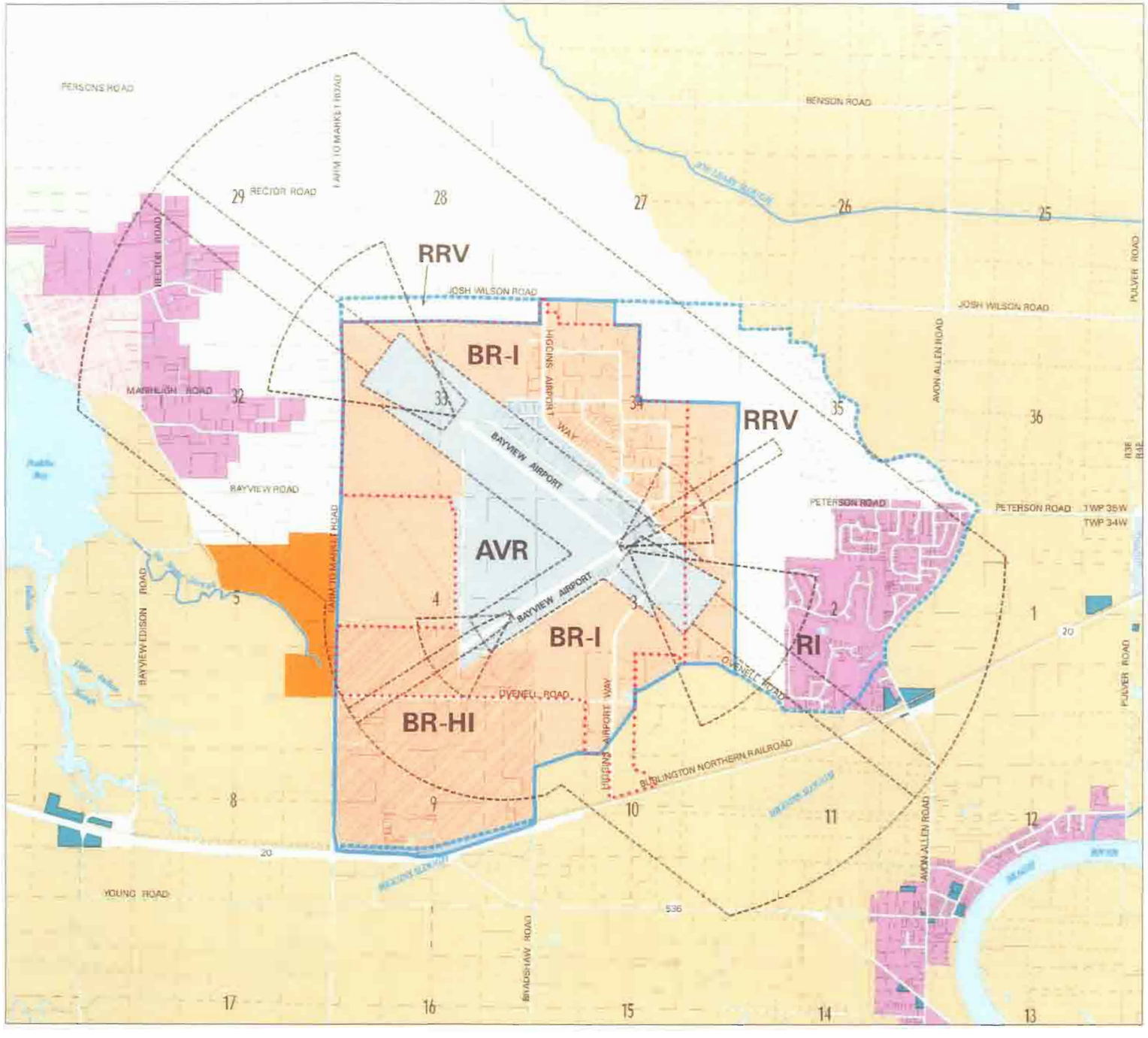
LAND USE COMPATIBILITY STUDY

A land use compatibility study was prepared for the Skagit Regional Airport in April 2000.[19] The study recommended the establishment of five safety zones and one "traffic pattern" zone. The zones are intended to minimize risks associated with potential aircraft accidents near the airport by:

1. limiting residential development and human density near the airport;
2. providing sufficient open space near the airport to allow successful emergency aircraft landing; and
3. restrict land uses near the airport to those without occupants of limited mobility.

The criteria for these zones are summarized in **Table 1-21**. It is noted that the criteria for the zones was developed by the Washington Department of Transportation – Aviation Division and is not recognized by the FAA Seattle Airports District Office.

[19] Skagit Regional Airport Land Use Compatibility Study. April 2000. Reid Middleton.



LEGEND

- Existing Interim Urban Growth Area Boundary
- Subarea Plan Boundary
- Port Of Skagit County Boundary
- Airport Environs Overlay

BAYVIEW RIDGE UGA ZONING

- Bayview Ridge Heavy Industrial (BR-HI)
- Bayview Ridge Industrial (BR-I)
- Aviation Related (AVR)

CURRENT COMPREHENSIVE PLAN DESIGNATIONS

INCORPORATED

- Incorporated Areas

RURAL

- (RRv) Rural Reserve
- (RI) Rural Intermediate
- (RV) Rural Village Residential

NATURAL RESOURCE LAND

- (RRc-NRL) Rural Resource - NRL
- (Ag-NRL) Agriculture - NRL
- (SF-NRL) Secondary Forest - NRL
- (IF-NRL) Industrial Forest - NRL
- (MRO) Mineral Resource Overlay

COMMERCIAL / INDUSTRIAL

- Commercial - Industrial
- (RB) Rural Business
- (RC) Rural Center
- (RVC) Rural Village Commercial
- (RFS) Rural Freeway Service
- (NRI) Natural Resource Industrial
- (SRT) Small-Scale Recreation & Tourism
- (CSB) Cottage Industry / Small-Scale Business
- (RMI) Rural Marine Industrial
- (MID) Major Industrial Developments (No properties currently designated)
- (MPR) Master Planned Resorts (No properties currently designated)

PUBLIC / OPEN SPACE

- (OSRSI) Public Open Space of Statewide/Regional Importance

February 2004

0 m 1/2 m 1 mi.

N W E S

SKAGIT COUNTY GIS DEPARTMENT

BAYVIEW RIDGE SUBAREA PLAN
COMPREHENSIVE PLAN
AND ZONING DESIGNATIONS

PORT OF SKAGIT COUNTY

CENTURY WEST ENGINEERING CORPORATION

DAVID EVANS AND ASSOCIATES INC

COMPREHENSIVE PLAN

SKAGIT REGIONAL AIRPORT
AIRPORT MASTER PLAN

FIGURE
1-6

TABLE 1-21: AIRPORT SAFETY ZONE

Land Use and Densities	*Open Space Requirements*	*Representative Land Uses*
Zone 1- Runway Protection Zone		
Residential: None Non-Residential: 5 to 10 people/acre	Maintain all undeveloped land in open space	Agricultural operations Tree farm (8 ft height restrictions)
Notes: 1. FAA and WSDOT encourage airport sponsor to acquire RPZ. 2. FAA suggests use of property as golf course but such use may not comply with suggested densities.		
Zone 2 – Inner Safety Zone		
Residential: None Non-Residential: 5 to 40 people/acre	50% open space within a 500-foot-wide strip along the extended runway centerline; 25% to 30% open space overall.	Light industrial uses Mini-storage Parking lots
Notes: 1. During site development process, shift all structures away from the runway centerline.		
Zone 3 – Inner Turning Zone		
Residential: 2 acres/DU to 10 acres/DU Non-Residential: 25 to 60 people/acre	15% to 20%	Light industrial uses Mini-storage Parking lots
Notes: 1. During site development process, shift all structures away from the runway centerline.		
Zone 4 –Outer Safety Zone		
Residential: 2 acres/DU to 5 acres/DU Non-Residential: 40 to 100 people/acre	25% to 30% open space within a 500-foot-wide strip along the extended runway centerline; 10% to 15% open space overall.	Small neighborhood shopping center Small office building
Notes: 1. During site development process, shift all structures away from the runway end.		
Zone 5 –Sideline Safety Zone		
Residential: Not Applicable, under Port of Skagit County ownership Non-Residential: 40 to 60 people/acre	25% to 30% open space adjacent to the runway ends and RPZ.	All aviation related land uses are considered acceptable.
Zone 6 –Traffic Pattern Zone		
Residential: Urban Areas: 4 to 6 DU/acre or higher with master planned developments Rural Areas: 2.5 acres/DU to 5 acres/DU Non-Residential: 100 to 150 people/acre	10% to 15% open space or an open useable area every ¼ to 1/2 mile.	Industrial uses Small restaurant Neighborhood shopping center Small office building Residential subdivisions

COMPREHENSIVE PLAN AND ZONING DESIGNATIONS

Most of the Bayview Subarea is located within an Airport Environs Overlay (AEO) zoning district. The AEO district is intended to ensure the development of compatible land uses in the area surrounding the airport. The district prohibits certain land uses such as schools and hospitals, the occupants of which could not rapidly move out of harm's way, ground storage of flammable or hazardous materials which are not incidental to the permitted use, and manufactured home parks.

Existing Skagit County comprehensive plan and zoning designations in the Bayview area include Aviation Related (AVR), Bayview Ridge Industrial (BR-I), Bayview Ridge Heavy Industrial (BR-HI), Rural Reserve (RRV), Rural Intermediate (RI), and Agricultural Natural Resource Lands (Ag-NRL).

The County developed the draft Bayview Ridge Subarea Plan[20] to facilitate the growth of a cohesive urban community in the area, including business/industrial facilities and moderate-density residential development that is also compatible with airport operations. The County has allocated 750 acres of new commercial/industrial land to the Subarea by 2015. A portion of this allocation will be met within the Port's Bayview Business and Industrial Park.

The Subarea Plan was adopted in December 2006 by the Skagit County Planning Commission and Board of County Commissioners. The Plan establishes the following land use designations within and surrounding the airport: Bayview Ridge Residential (BR-R), Bayview Ridge Community Center (BR-CC), Bayview Ridge Industrial (BR-I), and Aviation Related (AVR). **Table 1-22** outlines these land use designations and the estimated land available in each use area.

[20] Draft Bayview Ridge Subarea Plan. January 2004. Prepared by Reid Middleton.

TABLE 1-22: LAND USE/ZONING IN THE BAYVIEW RIDGE SUBAREA PLAN

Use/Zoning	Total Acres	Developed Acres	Roads/Right of Ways	Wetlands/ Buffers	Developable Acres
Aviation-Related	761	754	7	N/A	Infill
Community Center	15	0	0	7	8
Bayview Ridge Industrial	2,152	533	68	772	779
Bayview Ridge Residential	705	343	59	124	303
Sub-Total (UGA Total)	**3,633**	**1,630**	**134**	**903**	**1,090**
Rural Reserve	78	30	0	19	48
Urban Reserve	300	56	6	101	238
Subarea Total	**4,011**	**1,716**	**140**	**1,023**	**1,376**

EXISTING AND PROPOSED USES OF THE AIRPORT PROPERTY

Skagit Regional Airport is an "essential public facility" and the largest airport in Skagit County. The Port of Skagit County owns 1,817 acres of land on Bayview Ridge, including the 761-acre airport and the 1,056-acre Bayview Business and Industrial Park. The Port owns additional agricultural lands that lie outside the subarea. *Note: the airport and industrial park site acreage increased to approximately 1,836 acres in 2006 with the purchase of the portion of the Runway 28 protection zone that previously extended beyond airport property.*

Development of the Bayview Ridge area began with construction of the airport in 1933. The 761-acre airport area consists of two runways, taxiways, apron areas, a terminal building, parking and entrance roads, support facilities, air cargo operations, and aircraft storage facilities. As noted above, based on recommendations of the *Skagit Regional Airport Land Use Compatibility Study*, the Port recently acquired 22.76 acres of AVR-use land, which lies within the Runway (28) Protection Zone (RPZ).

Within the 1,056-acre Business and Industrial Park, 108 acres are currently developed with industrial operations and businesses. The presence of extensive wetlands on the property has limited the availability of developable land. In 1994 the Skagit Wetlands and Industrial Negotiations (Skagit WIN) process was initiated to identify significant wetlands on the Port's property and plan future development accordingly to minimize wetland impacts at the property, while still accommodating a sufficient level of industrial development to occur. The Skagit WIN process resulted in an agreement to preserve 250 acres of high functioning wetlands and 178 acres of adjacent buffers on the property.

The agreement allows development of 254 acres of the Port's land, including the filling of 7.7 acres of low functioning wetlands.[21] A copy of the WIN map is provided in **Figure 1-7**.

Existing comprehensive plan and zoning designations within the Port's property consists of Aviation Related uses (AVR) and Bayview Ridge Industrial (BR-I).

ENVIRONMENTAL CONDITIONS

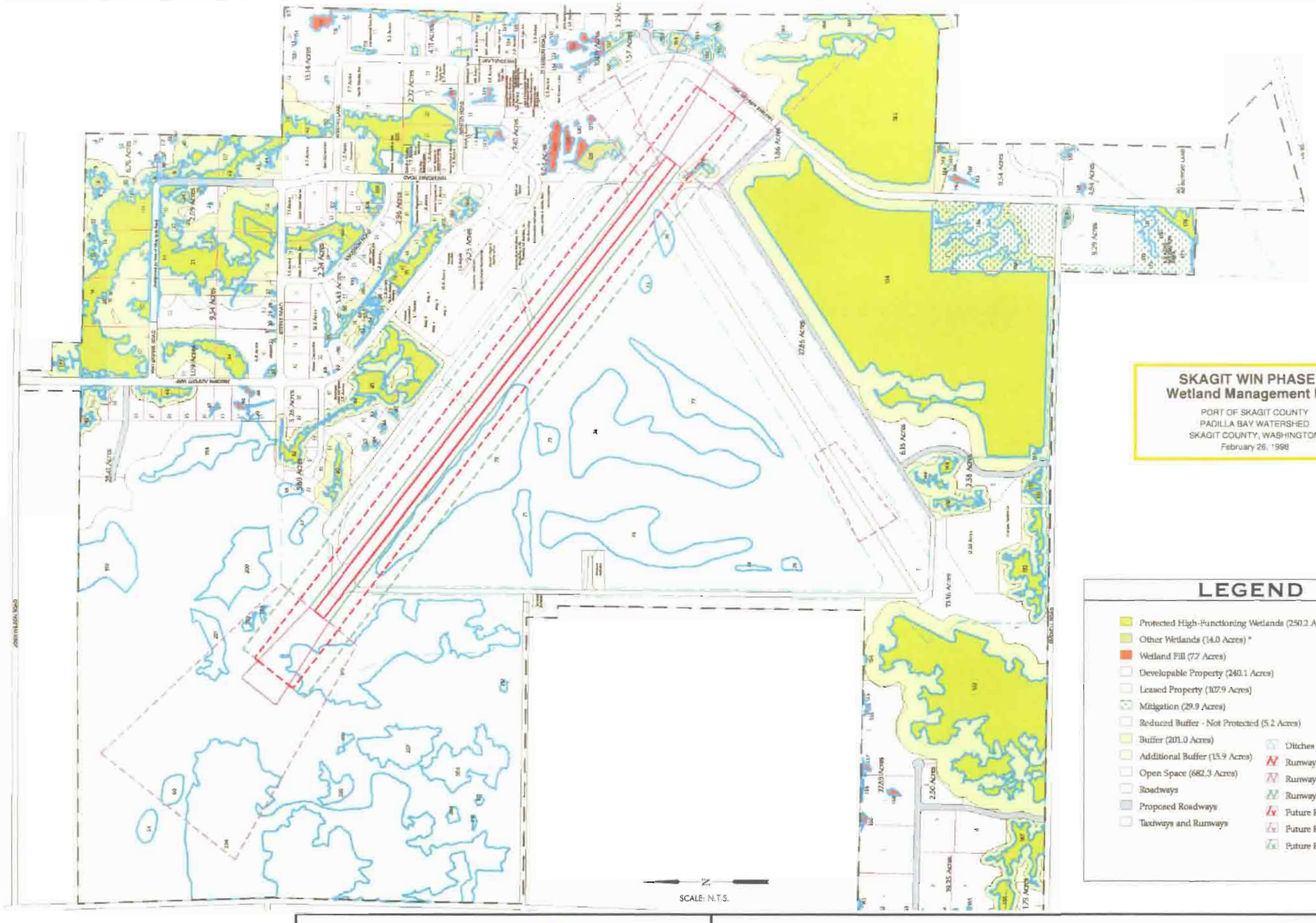
STORM DRAINAGE AND WATER QUALITY TREATMENT

An extensive network of open roadside ditches drains the entire Bayview Ridge area including the airport. The Washington State Department of Fish and Wildlife (WDFW) issued a letter dated April 10, 1997, stating that these man-made ditches are artificial watercourses and are exempt from WDFW regulation. The Port's property, including the airport, is located within the Skagit County Drainage Utility area. The Port maintains the ditches located on Port property. Most of the drainage from the Port's property drains to a series of ditches within Drainage District No. 19, south of the property and eventually discharges to Indian Slough and Padilla Bay.

Soils in the area generally have slow permeability and seasonal perched water tables, limiting stormwater infiltration in the area. These soils are mapped as the Bow gravelly loam, 0 to 3 percent slopes, in the Soil Survey for Skagit County, with the Bellingham silt loam occurring in depressions in the area. Both the Bow and Bellingham Series are poorly to very poorly drained mapping units.

The Padilla Bay/Bayview watershed has experienced water quality problems in recent years. Indian Slough, Joe Leary Slough, and No Name Slough have all been designated "problem areas" in the 2002 Water Quality Summary for WRIA 3. These areas have failed to meet water quality standards for fecal coliform, dissolved oxygen, and/or temperature. Higgins Slough has not been identified as a problem area. Runoff from residential areas surrounding the Port's facilities currently receives little or no water quality treatment. Industrial facilities in the area have been identified as contributing pollutants to downstream areas in the past.

[21] The Army Corps of Engineers issued a Section 404 individual permit for the anticipated wetland impacts on September 8, 2000. The permit extends until September 2020.



PORT OF SKAGIT COUNTY

CENTURY WEST ENGINEERING CORPORATION

DAVID EVANS AND ASSOCIATES INC

WIN

SKAGIT REGIONAL AIRPORT
AIRPORT MASTER PLAN

FIGURE

1-7

A Stormwater Management Master Plan was developed for the Port of Skagit County in 1998.[22] The Plan resulted in the development of stormwater detention and treatment areas for the Port's existing facilities. All future development in the Industrial Park will be required to provide on-site stormwater treatment per current standards and regulations. At present, Skagit County has adopted the 1992 Washington State Department of Ecology *Stormwater Management Manual for the Puget Sound Basin* as the acceptable standard for water quality treatment.

WETLANDS

The airport and surrounding area contain extensive wetlands. The occurrence of these wetlands is one of the most significant constraints to land use in the area. Recognizing this, the Skagit WIN process was initiated in 1994 to identify and characterize all wetlands on the Port's property and develop a multi-agency agreement that allows development of the property while protecting wetlands to the maximum extent possible.

Approximately 279 acres of wetlands have been delineated and characterized within the Port's property. The Skagit WIN agreement permanently protects 250 acres of the highest functioning wetlands and allows fill of 7.7 acres of lower functioning wetlands over a 20-year period. The agreement provides for the dedication of 685 acres of open space within the Port's property and established buffers for wetlands at the site. The Army Corps of Engineers issued a 20-year permit for the proposed wetland fills on September 8, 2000.

The Skagit WIN process provided advanced compensation for wetland impacts to occur over the 20-year period. The mitigation plan provides for 8 acres of wetland restoration, 6.5 acres of wetland enhancement, and 250 acres of preservation. This mitigation plan has been implemented and is currently in a 10-year monitoring period.

FISH AND WILDLIFE HABITAT

Several bald eagle nests and habitats have been identified in the airport vicinity in the WDFW Priority Habitats and Species (PHS) database. These include areas west and northeast of the Port's property. Coho salmon have been identified in Higgins Slough south of the airport and have occasionally been found in ditches along Higgins Airport Way. Coho salmon were recently

[22] Port of Skagit County Bayview Business and Industrial Park and Skagit Regional Airport Stormwater Management Master Plan. October 1998. David Evans and Associates, Inc.

downlisted by the U.S. Fish and Wildlife Service from "candidate species" to "species of concern". Significant water bird concentrations are known to exist in Padilla Bay, approximately one mile west of the airport, and within the network of sloughs entering Padilla Bay from the southeast.

Several small open water ponds exist within and adjacent to the Port's property. These include twin stormwater detention ponds located east and west of Watertank Road within the industrial park and a stock pond located at the southern boundary of the Port's property, east of Higgins Airport Way.

The Federal Aviation Administration (FAA) has issued guidance regarding wildlife attractions near airport.[23] For safety reasons, the guidance recommends that any wildlife attractions be located at least 10,000 feet away from any turbine-use runway, such as Runway 10/28 at Skagit Regional Airport.

PARKS AND RECREATION AREAS

Parks and recreation areas in the vicinity of the airport include Bayview State Park, the Padilla Bay National Estuarine Research Reserve, Breazeale Interpretive Center, and the Padilla Bay Shore Trail.

The Port of Skagit County maintains an 11-mile pedestrian circulation system within the industrial park. The system consists of 8-foot wide gravel paths winding through the industrial park and open space areas. These paths were constructed to meet an urban standard for pedestrian circulation constructed in lieu of curb, gutter, and sidewalks.

The Skagit Golf and Country Club is located east of the Port's property. The facility consists of a private 18-hole course surrounded by residential development.

The 1998 Skagit County Comprehensive Park and Recreation Plan recommended development of a 25-acre community park in a location south of Peterson Road and west of the Bayhill development, near the industrial park. Based on the findings of the Skagit Regional Airport Land Use Compatibility Study, the Draft Bayview Ridge Subarea Plan recommends re-examining the proposed location of the community park. The park would consist of ball fields, playground structures, trails and viewpoints, picnic areas, parking, and restrooms.

[23] FAA Advisory Circular, AC 150/5200. Wildlife Attractions on or Near Airports.

AIR QUALITY

The Northwest Air Pollution Authority (NWAPA) sets air quality standards for new sources of air contaminants in Skagit County. Air quality in the county and airport vicinity is good and well below attainment standards set by both the federal government and NWAPA. The Skagit County Comprehensive Plan recognizes air quality as an important quality of life factor for county residents and identifies measures that the county can take to minimize public exposure to airborne pollutants.

WASTE WATER AND SOLID WASTE DISPOSAL

Solid waste collection and disposal in the Bayview Ridge area is provided by Rural Skagit Sanitation, owned by Waste Management Northwest. Collection of solid waste and recycling is provided weekly. Waste is hauled to the transfer station at Ovenell and Farm to Market Roads (the County's main transfer station). All solid waste in Skagit County is transported by rail to the Klickitat Landfill in southeast Washington.

The City of Burlington provides sewer service to the Port of Skagit County. The City purchased the sewer collection system at the Port in 2000. The City maintains a wastewater treatment facility, sewage collection system, and sewer mains.

AIRPORT SERVICE AREA

An airport service area refers to the geographic area surrounding an airport that is directly affected by the activities at that airport. With numerous airports nearby, service areas often overlap, creating competition between airports. Having several airports located within a relatively short range of travel time, user demand for items such as hangar space, fuel and aviation services will be largely driven by cost, convenience and the quality of facilities and service available.

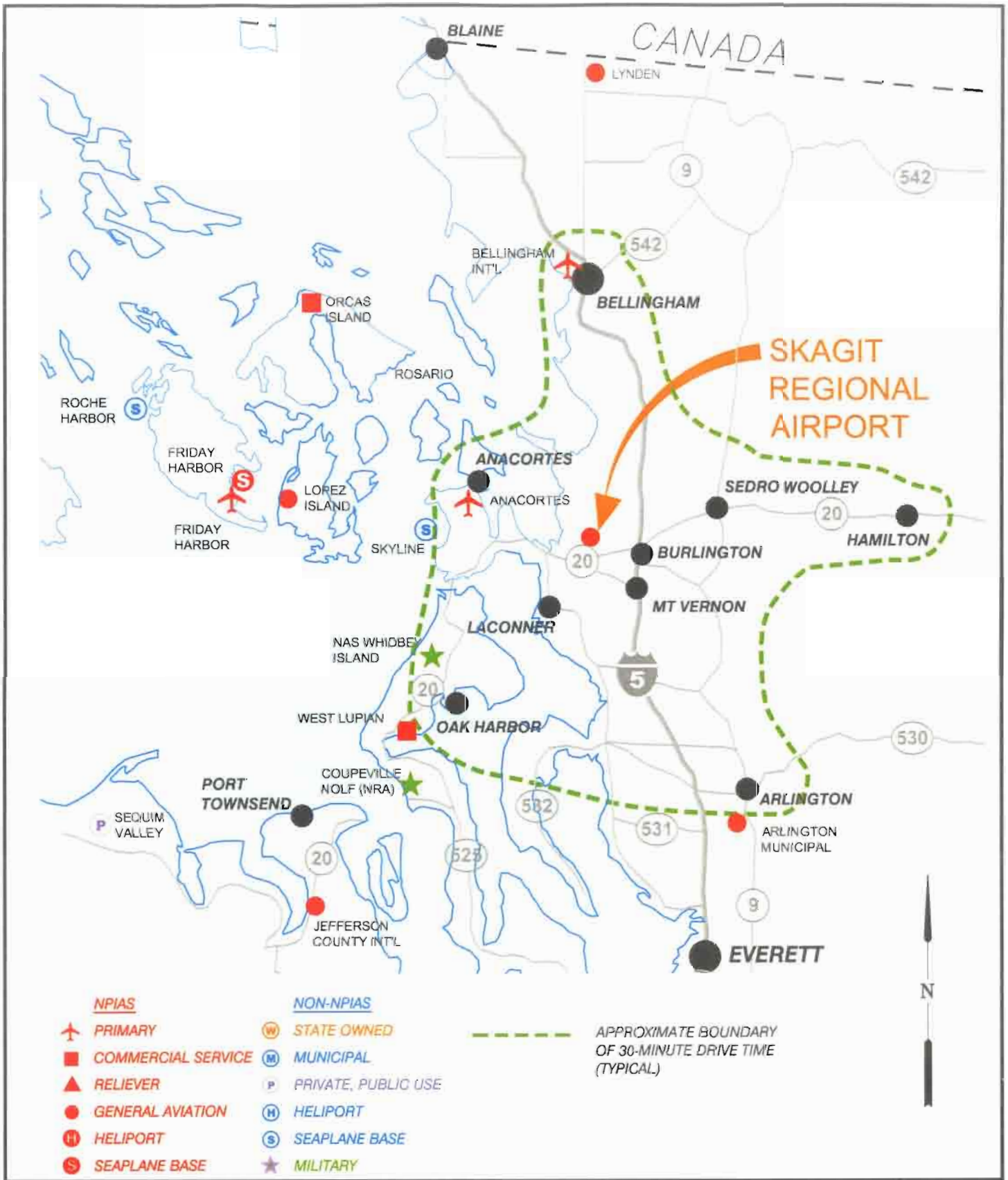
A 30-minute surface travel time is often used to define the service area boundaries of a general aviation airport with several competing airports located nearby. Airports located beyond 30 minutes have less impact on local airport activity due largely to the redundancy provided by closer facilities. Demand for major or regional airline service usually involves greater travel distances due to the limited number of airports providing that service. The majority of local users of Skagit Regional will live or work within 30 minutes of the airport. Some specialized activities, such as scheduled air service may draw users from greater distances. It is also recognized that Skagit Regional Airport's close proximity to the San Juan Islands affects activity levels. One of the local fixed base operators reports that the absence of island airports capable of accommodating larger business aircraft

contributes to itinerant business activity at BVS. **Figure 1-8** illustrates the boundary of a typical 30-minute drive from the local area.

Table 1-23 lists the public airports within a 30 nautical mile radius of BVS. Despite their relatively close proximity to BVS, the surface travel times to these airports can vary greatly depending on the surface route available.

TABLE 1-23: PUBLIC USE AIRPORTS IN VICINITY (WITHIN 30 NAUTICAL MILES)

Airport	Location	Runway Dimension (feet)	Instrument Approach?	Lighted Runway?	Fuel Available?
Jefferson County Int'l. (Port Townsend)	30 nm SW	3,001 x 75	No	Yes	Yes
Concrete Municipal	26 nm E	2,580 x 60	No	No	No
Arlington	21 nm SE	5,333 x 100 (primary rwy)	Yes	Yes	Yes
Whidbey Is. NAS *(military use only)*	11 nm SSW	8,001 x 200 (primary rwy)	Yes	Yes	No
Camino Island	13 nm SSW	1,750 x 24	No	No	No
Anacortes	9 nm W	3,015 x 60	No	Yes	Yes
Wes Lupien (Whidbey Is.)	16 nm SW	3,255 x 25	No	Yes	No
Coupeville Naval Outlying Field *(military use only)*	28 nm SW	5,400 x 200	No	Yes	No
Whidbey Airpark (Langley)	27 nm S	2400 x 25	No	No	No
Bellingham International	20 nm NNW	6,701 x 150	Yes	Yes	Yes
Lynden	29 nm N	2,425 x 40	No	Yes	Yes



PORT OF SKAGIT COUNTY

CENTURY WEST ENGINEERING CORPORATION

DAVID EVANS AND ASSOCIATES INC

AIRPORT SERVICE AREA

SKAGIT REGIONAL AIRPORT AIRPORT MASTER PLAN

FIGURE

1-8

Chapter Two

Aviation Activity Forecasts

CHAPTER TWO
AVIATION ACTIVITY FORECASTS

INTRODUCTION

The purpose of this chapter is to update the forecasts of aviation activity for the twenty-year planning period addressed in the Airport Master Plan Update (2005-2025). The forecasts of aviation demand will also be extended over a 50-year period to provide a long-term indication of aviation use land requirements.

The updated activity forecasts will provide the basis for estimating future facility needs at BVS. The 1995 Airport Master Plan, Washington State Aviation System Plan forecasts, and current Federal Aviation Administration (FAA) forecasts will be compared with current and historical activity at Skagit Regional Airport (BVS) to determine their applicability for use in this planning update.

EXECUTIVE SUMMARY

The updated master plan forecasts of aviation activity reflect strong local conditions that contribute to overall economic growth and a thriving local general aviation market. Public and private investment at BVS since the last master plan has increased significantly, particularly related to increasing hangar capacity and expanded airport services (i.e. fixed base operators). Business use of the airport has also increased significantly over the last three to five years, with the addition of jet fuel and the operation of a fixed base operator that specializes in serving corporate aircraft.

- Based aircraft and annual aircraft operations are forecast to increase at an average annual rate of approximately 1.4 and 1.8 percent respectfully.

- Scheduled commercial passenger service was introduced at BVS in late 2004 and was terminated in mid-2005. Despite this short period of service, it is expected that BVS has the ability to regain and sustain modest levels of scheduled commercial passenger service with small aircraft during the current 20-year planning period. Due primarily to airport and

operator regulatory requirements, but also based on market potential, use of 5- to 8-seat passenger aircraft is expected to represent the most likely level of scheduled service during the current 20-year planning period.

- Turbine aircraft operations associated with multi-engine turboprops and business jets are expected to increase at a slightly higher rate than piston aircraft activity during the planning period, increasing from about 3 to 4.5 percent of overall activity. Both the existing and future design aircraft are business jets that reflect the growing levels of business aircraft activity at the airport. In addition, the anticipated growth of "micro jets" or very light jets within the general aviation fleet is expected to be an element in the airport's growing levels of turbine aircraft activity.

- Commercial operations at BVS are expected to increase from about 3.5 percent of total operations in 2004, to approximately 5.7 percent by 2025.

Summary of Key Elements in Updated Aviation Forecasts:

***A note on Commercial Passenger Activity Forecasts**: As noted above, scheduled commercial passenger air service at BVS was terminated in mid-2005. However, for planning purposes, the forecasts of commercial passenger activity originally developed in early 2005 have not been modified based on a reasonable expectation that scheduled service will resume in the forecast period and reach the modest levels forecast by the 2015 to 2020 timeframe.*

Commercial Passenger Enplanements - With the introduction of scheduled passenger service in the 4th quarter of 2004, the base year passenger enplanements totaled less than 1,000. Future year forecasts of passenger enplanements reflect a mid-range scenario for commercial air service that consists of service with 8-passenger or smaller single-engine aircraft. Due to the nominal baseline activity levels for 2004, average annual growth rates for passenger enplanements are initially very high. However, in real terms, enplanements are expected to remain modest during the twenty-year planning period: annual passenger enplanements are projected to increase from an estimated 625 (2004) to approximately 4,300 in 2025. The forecast number of passenger enplanements per departure is expected to range from 2.7 to 3.4 during the planning period. The passenger enplanements totals also include passengers associated with air taxi charter flights.

Commercial Operations (Passengers) - Forecast commercial passenger operations include scheduled service and unscheduled air taxi operations. Scheduled commercial air service with aircraft seating up to eight passengers is expected to be sustainable during the planning period. It is assumed that local demand for regional or national commercial air service will continue to be accommodated

at Bellingham International Airport, and possibly at Paine Field in Everett, both of which are located within 30 minutes of Burlington. Commercial passenger air service at BVS is expected to consist mostly of connecting fights to nearby commercial airports and service to the nearby San Juan Islands.

Commercial Operations (Cargo/Express) - The majority (85-95 percent) of air cargo operations consist of the twice-daily express (FedEx) flights operated with Cessna Caravan single-engine turboprop aircraft. The current volume of 2 aircraft per day (5 days per week) results in approximately 1,060 annual operations. This level of activity is expected to remain relatively stable during the planning period based on typical aircraft utilization, capacity, etc. BVS previously accommodated a substantial amount of cargo activity associated with a regional operator of Beech 18 aircraft. The operator is no longer in business and future cargo activity is expected to be modest. A small portion of forecast cargo operations consists of air taxi freight and mail flights to the adjacent San Juan Islands.

General Aviation Activity - Forecast growth in based aircraft and aircraft operations at BVS is modest through the twenty-year planning period. Due to a current surge in hangar construction, BVS is expected to initially experience a moderately sharp activity increase in both based aircraft and operations, followed by more modest growth rates (typically less than 2 percent per year) through the remainder of the planning period.

Jet Fuel first became available at BVS in 2002 and now accounts for more than 60% of total aviation fuel deliveries at BVS. Although the number of locally-based turbine aircraft has increased from 0 in 1993 to 9 in 2005, a local fixed base operator attributes the majority of jet fuel sales to growing use of BVS by transient business jet and turboprop aircraft. In particular, increased activity in the medium to large business jet segment has significantly increased the average number of gallons sold per transaction.

Design Aircraft - The current design aircraft for BVS is a small or medium business jet such as the 6 to 8-passenger Cessna Citation II, included in airplane design group II and approach category B. The future design aircraft is expected to be medium to large business jet, such as the Gulfstream IV, included in airplane design group II and approach category D. BVS currently accommodates both locally-based and transient jet aircraft included in approach category C and D.

National General Aviation Activity Trends

After an extended period of decline, the U.S. general aviation industry experienced a period of sustained growth between 1994 and 2000 (coinciding with the General Aviation Revitalization Act of 1994). During this period, the general aviation fleet increased by 25 percent overall, or about 3.2

percent per year. The fastest growing fleet segments during this period were business jets, helicopters and experimental aircraft, which increased between 7.5 and 9 percent per year. The general aviation industry experienced a significant downturn in 2001, which began with an economic slowdown and then accelerated following the events associated with September 11th. Over the last three years, a steep rise in aviation fuel prices combined with weak economic conditions has continued to depress the general aviation industry. However, as noted in the FAA's current long-term forecasts,[24] several key economic indicators have shown signs of improvement and this trend is expected to continue in 2005 and beyond. These expectations are generally in line with broad-based measures of economic health such as long-term forecasts of gross domestic product (GDP), consumer price index, fuel prices and interest rates. Although some segments of general aviation (primarily business aircraft usage) are expected to grow at moderately high rates, most conventional measures of the general aviation industry suggest modest, sustained growth in the range of 0.5 to 2 percent annually over the next 10 to 25 years.

The FAA's long-term forecasts project a very conservative increase in the number of aircraft in the U.S. general aviation fleet between 2003 and 2015. The FAA's forecasts for hours flown, tower operations and instrument operations also reflect modest annual average growth ranging from about 1.7 to 2.1 percent over the next ten years. Certain segments of activity, such as hours flown for turbine aircraft, (particularly business jets) are expected to increase at rates approaching 4 percent per year. Several of the FAA's general aviation activity growth assumptions are summarized in **Table 2-1.**

Although single-engine piston aircraft (not including experimental) account for nearly 70 percent of the GA fleet, the rate of growth in business jets, turboprops, piston and turbine helicopters, and experimental aircraft has been two to four-times greater than single-engine aircraft over the last several years. The number of business jets in the GA Fleet has increased by more than 80 percent since 1994. Strong increases in the number of corporate aircraft operators, fractional ownership of business aircraft, and aircraft charter activity appears to represent a business response to current commercial air service options. At the opposite end of the general aviation industry, the number of experimental aircraft in the U.S. GA Fleet increased by nearly 70 percent between 1994 and 2001.

In addition, the FAA considers the ongoing development and planned deliveries of "very light" business jets such as the Eclipse or Cessna Mustang to be among the more significant events affecting business aviation activity over the next several years. The FAA expects that as many as

[24] FAA Terminal Area Forecast (TAF) Fiscal Years 2002-2020; FAA Aerospace Forecasts, Fiscal Years 2003-2015; FAA Long-Range Aerospace Forecasts, Fiscal Years 2020, 2025 and 2030.

4,600 new very light business jets could be added to the U.S. fleet by 2015. With relatively low acquisition and operating costs, the FAA anticipates that this category of aircraft will become increasingly popular for use in on-demand air-taxi business service.

The FAA expects some activity segments to offset flat or declining numbers in other categories. For example, the FAA predicts that the multi-engine piston fleet will decline by 0.5 percent annually through 2015. This downward trend is attributed to fleet attrition and the lack of multi-engine piston aircraft production. Similarly, the single-engine piston fleet is expected to lose approximately 1,500 aircraft per year to attrition. While production of new light sport aircraft is expected to help arrest the downward trend, overall growth is expected to be less than 1 percent annually through 2015. Growth in the number of pilots is also expected to be in the range of 1.6 to 1.8 percent annually through 2015, with growth slowing over the longer period between 2015 and 2025.

TABLE 2-1: FAA LONG RANGE FORECAST ASSUMPTIONS

Activity Component	Forecast Annual Average Growth Rate (2003-2015)	Forecast Annual Average Growth Rate (2016-2030)
Pilot Population (All Ratings)	1.6%	1.3%
Student Pilots (indicator of flight training activity)	1.8%	--
Hours Flown - GA Fleet (All AC Types)	1.5%	1.7%
Instrument Operations at FAA and Contract Towers	2.1%	1.9%
Active GA Fleet (# of Aircraft)	1.3%	0.8%
AVGAS (Gallons consumed - GA only)	2.8%	n/a
Jet Fuel (Gallons consumed – GA only)	5.1%	n/a

Source: FAA Long Range Aerospace Forecasts (FY 2003-2015) March 2004; (FY 2020, 2025 and 2030), July 2004.

Population and Economic Trends

Changes in population within an airport's service area often provide a broad indication about trends in airport activity. Although a large number of factors normally affect activities at general aviation airports, changes in population often reflect other economic conditions, which may affect airport activity more directly. However, since it is difficult to identify specific connections between airport activity and individual economic indictors such as growth in personal income, unemployment rates, or business spending, population provides a general indication of an area's economic health. Regions

with flat or declining populations often have weak underlying economic conditions. In contrast, higher rates of population growth often characterize a growing economy that can stimulate individual and business use of general aviation.

Population growth within Skagit County has generally outpaced Washington's statewide averages over the last twenty years. Between 1980 and 2004, Skagit County's population increased by 69 percent, which equals an average annual growth rate of 2.2 percent. **Table 2-2** summarizes county and statewide population data from the U.S. Census and a certified estimate for 2004, prepared by the State of Washington.[25] **Figure 2-1** and **Table 2-3** illustrate that the rate of growth in based aircraft at BVS and Skagit County population has been very consistent over the last twelve years.

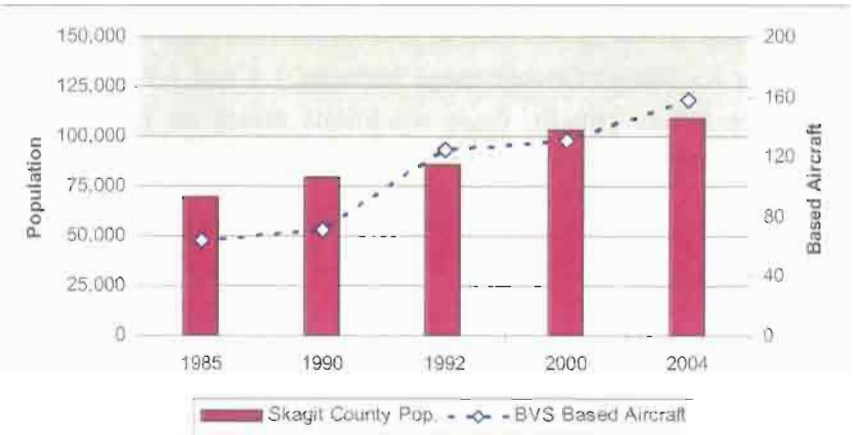
TABLE 2-2: HISTORICAL POPULATION

	1970[1]	1980[1]	1990[1]	2000[1]	2004[2]
Skagit County	52,381	64,138	79,545	102,979	108,800
Overall Growth Percentage *(from prior data period)*	--	+22.5%	+24.0%	+29.5%	+5.7%
Average Annual Growth Rates	--	+2.1%	+2.2%	+2.6%	+1.4%
State of Washington	3,143,250	4,132,353	4,866,669	5,894,121	6,167,800
Overall Growth Percentage *(from prior data period)*	--	+31.5%	+17.8%	+21.1%	+4.6%
Average Annual Growth Rates	--	+2.8%	+1.7%	+1.9%	+1.1%

1. U.S. Census Data. 2. Washington State Office of Financial Management Estimates for April 1, 2004.

[25] Washington State Office of Financial Management (OFM), April 1, 2004 Estimate

FIGURE 2-1: POPULATION & BVS BASED AIRCRAFT TRENDS



Source:

(Population Data) US Census; Washington OFM; (Based Aircraft) Airport Management Estimates and FAA 5010 airport record forms

TABLE 2-3: COMPARISION OF AVERAGE ANNUAL GROWTH RATES SKAGIT COUNTY POPULATION AND BVS BASED AIRCRAFT

	1985-2004	1985-1992	1992-2004
Skagit County Population *Average Annual Rate (AAR)*	2.4%	2.0%	2.0%
Based Aircraft (BVS) *Average Annual Rate (AAR)*	4.9%	9.9%	2.0%

As noted in the Inventory Chapter, the Washington State Office of Financial Management (OFM) has developed long term population forecasts for Skagit County that extend through 2025. The Washington Growth Management Act (GMA) Steering Committee adopted a 2025 population forecast and allocation for Skagit County based on a mid-point between the low and intermediate OFM projections. The adopted 2025 population forecast for Skagit County is 149,080, which reflects annual average growth of 1.49 percent (between 2000 and 2025). The expectation of future population growth in Skagit County that exceeds statewide averages, suggests a presence of positive economic conditions that can be reasonably expected to contribute to growth in airport activity.

Economic Conditions

As noted in the Inventory Chapter, the major industries in Skagit County include agriculture, fishing, wood products, tourism, international trade, and specialized manufacturing, including two petroleum

refineries. The Port of Skagit County maintains a substantial inventory of both developed and developable industrial land immediately adjacent to the airport. Substantial growth in the retail segment during the 1990s has driven an increase in jobs in the retail and services industries. Long-term employment forecasts for Skagit County range between 1.4 and 1.9 percent annually. When combined with overall population growth, these conditions create an environment that is very positive for sustaining growth in aviation activity.

Historic Aviation Activity

Historic operational data for BVS are relatively limited and consist largely of past FAA (5010 Airport Record Forms) and periodic airport management estimates. No formal activity counts have been conducted at the airport in recent years. In cases where documented activity counts are not available, the FAA recommends use of a range of ratios (annual operations per based aircraft) in order to estimate local and itinerant general aviation operations. The range of FAA activity ratios reflects typical operational profiles for small, medium and large general aviation airports.

The Port maintains current (January 2005) and very detailed based aircraft records; that data is considered highly reliable and will serve as "base year" activity for purposes of forecasting based aircraft. However, when recent operations estimates for BVS are combined with current based aircraft totals, the resulting activity ratios exceed the FAA's recommended range of aircraft utilization by a considerable margin. In the absence of precise activity counts, the accuracy of the recent operations estimates cannot be determined. For this reason, use of the FAA-recommended activity ratio for medium-activity general aviation airports (defined as those with "moderate to high levels of itinerant traffic and low to medium use by based aircraft") is recommended in this forecasting effort to establish the base year (2004) aircraft operations.

The Port recently purchased two automated aircraft activity counters, which will be used to generate activity counts on an on-going basis. Once a multi-year record of airport activity can be accumulated, it is recommended that the master plan forecasts be reviewed, and updated as necessary to reflect documented activity counts.

The 1995 Master Plan estimated based aircraft in 1993 at 143 aircraft; the January 2005 estimate of 158 aircraft represents a 10.5 percent increase from the 1993 estimate. However, other estimates from 1992 (125 aircraft) and 1998 (119 aircraft) suggests that some fluctuation may have occurred during that period, followed by stronger growth in recent years. The amount of new hangar construction at the airport suggests strong market activity. However, the percentage of BVS based aircraft stored in hangars has increased significantly, from about 39 percent in 1993 to 66 percent

currently. There was also a reduction in the actual number (and percentage of locally-based fleet) of aircraft parked on aprons during the same period. Historic activity at BVS is summarized in **Table 2-4.**

TABLE 2-4: SUMMARY OF HISTORICAL AVIATION ACTIVITY (BVS)

Year	Aircraft Operations	Based Aircraft	Operations Per Based Aircraft
1982	21,015	--	--
1983	18,454	--	--
1984	22,744	--	--
1985	27,882	64	436
1986	30,258	76	398
1987	36,000	76	474
1988	36,000	71	507
1989	36,000	71	507
1990	51,030	71	719
1991	51,060	111	460
1992	55,230[1]	124[1]	445
1993	--	143[1]	--
1998	55,232	119[2]	464
2003	54,232	121	448
2002	79,900[3]	125[3]	639
2004	57,400[4]	158[2]	363

Data Sources: FAA 5010 Airport Record Forms and Terminal Air Forecasts (TAF) except where otherwise noted (see additional sources below).

Table Notes: 1. 1995 Airport Master Plan. 2. Airport Management Estimates. 3. WSDOT 2002 Aviation System Plan Forecast Update. 4. David Miller/Century West Engineering Estimate.

Based Aircraft

According to a detailed summary of based aircraft prepared by airport management, there are currently (January 2005) 158 based aircraft at BVS including2 locally based business jets; 2 military surplus jets; and 6 turboprops. All other based aircraft are single-engine piston, multi-engine piston.

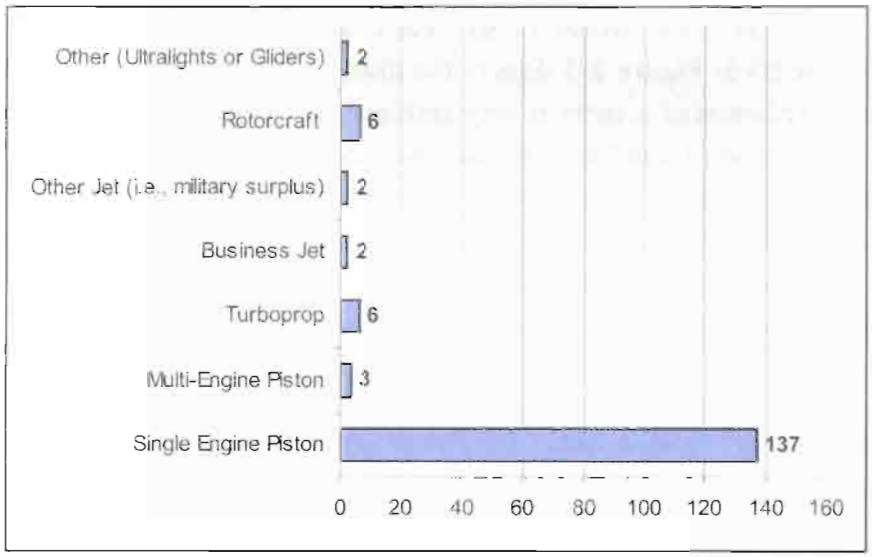
piston and turbine helicopters, gliders or ultralights. One significant factor that has affected airport activity is the relatively recent availability of jet fuel and an expansion of FBO services at BVS geared toward business aviation. The 1995 Airport Master Plan indicates that no turbine aircraft were based at BVS at the time. The current distribution of BVS based aircraft is summarized in **Table 2-5** and depicted in **Figure 2-2.**

TABLE 2-5: BVS BASED AIRCRAFT (JANUARY 2005)

Aircraft Type	Aircraft
Single Engine Piston	137
Multi-Engine Piston	3
Turboprop	6
Business Jet	2
Other Jet *(i.e., military surplus)*	2
Rotorcraft	6
Other (*Ultralights or Gliders*)	2
Total	**158**

Source: Airport Management Records

FIGURE 2-2: BVS BASED AIRCRAFT (JANUARY 2005)



Aircraft Operations

Table 2-6 summarizes the most recent (2003) FAA Terminal Area Forecast (TAF) historic operations estimate for BVS. **Figure 2-3** depicts the distribution of traffic by aircraft type for the TAF estimate. The distribution of activity is very similar to the 1992 base year activity distribution contained in the 1995 Airport Master Plan. One notable exception is the level of air taxi & commuter activity (which includes air cargo), which was estimated at about half the 1992 base year total. This decline would appear to be consistent with the reduced or eliminated cargo operations by Methow Aviation and Aeronautical Services at BVS in recent years. Local operations include touch and go operations and operations conducted in the vicinity of the airport; itinerant operations are defined as flights between airports.

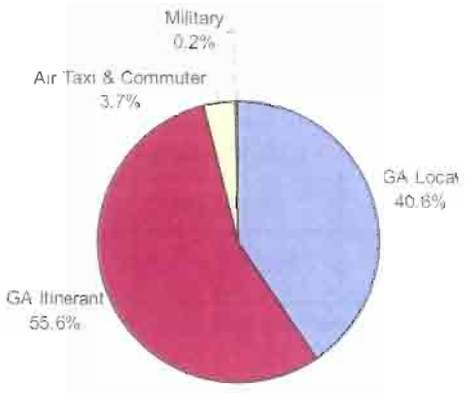
According to Corporate Air Center, a local FBO that provides service to business aviation, the level of itinerant turbine business aircraft operations has increased steadily since the addition of their 3,000-gallon jet fuel truck and expansion of services catering to corporate aviation users. A substantial portion of this activity is associated with leisure travel to the San Juan Islands and corporations with business interests in the local area. The number of large business jets including Gulfstream III & IV, Global Express, Falcon 900 and other similar aircraft visiting the airport is now typically 2 or 3 per week. As previously noted in **Table 2-5**, BVS currently accommodates eight locally-based turbine business aircraft and two military surplus jets. The FBO also indicates that BVS regularly accommodates fractional business jet operators (Netjet, Flexjet, etc.).

TABLE 2-6: 2003 TAF AIR TRAFFIC DISTRIBUTION (BVS)

Operations by Type	Operations	Percent by Type
Itinerant		
General Aviation	30,132	55.6%
Air Taxi & Commuter	2,000	3.7%
Military	100	0.2%
Total – Itinerant	32,232	*59.4%*
Local		
General Aviation	22,000	*40.6%*
Total Airport Operations	**54,232**	**100%**

Source: FAA TAF 2003 Data.

FIGURE 2-3: 2003 AIRPORT OPERATIONS DISTRIBUTION (BVS)



Based on a review of the current airport management based aircraft data, commercial passenger and cargo activity, and FAA aircraft utilization data, an updated estimate was prepared by the Consultant (*David Miller, AICP - Century West Engineering*). Based on this, the combined total of general aviation local and itinerant and commercial (passenger and cargo) is estimated at 57,400 aircraft operations for 2004. In the absence of more precise activity data, this estimate will be used as the base year total for developing aircraft operations forecasts. As noted earlier, it is recommended that once an extended period of activity data is collected and analyzed, the base year operations estimate and subsequent forecasts should be reviewed and updated if necessary.

AVIATION INDICATORS/INFLUENCES

Aviation Fuel Data

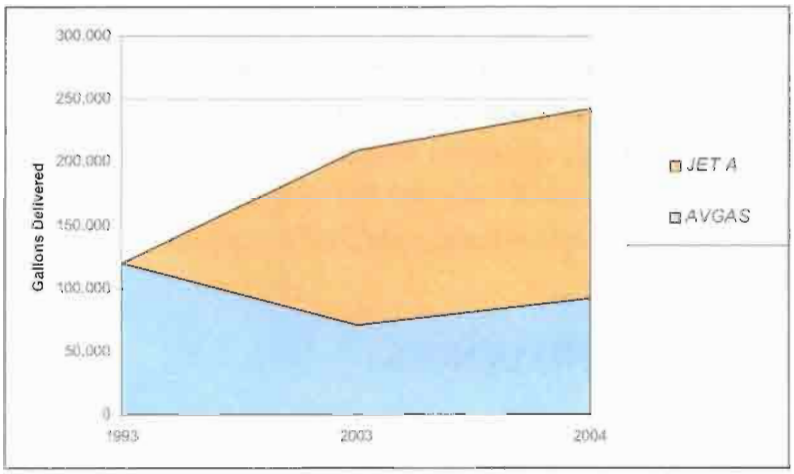
A review of aviation fuel deliveries at the airport was conducted to help gauge current activity trends. The data summarized in **Table 2-7** and **Figure 2-4** indicates that overall fuel delivery volumes have doubled since 1993, which can be fully attributed to jet fuel. As noted in the table, jet fuel was not available in 1993, but accounted for 62 percent of aviation fuel volume at BVS in 2004.

TABLE 2-7: AIRPORT FUEL ACTIVITY (BVS)
(Gallons delivered)

	1993	2002	2003	2004
AVGAS	120,000 *(100%)*	50,128 *(72%)*	70,466 *(34%)*	92,089 *(38%)*
Jet Fuel	n/a	19,939 *(28%)*	139,227 *(66%)*	150,175 *(62%)*
Total	**120,000** *(100%)*	**70,067**[1] *(100%)*	**209,693** *(100%)*	**242,264** *(100%)*

Source: Airport Records. Note: 2002 reflects partial year data (Aug-Dec). Percentages of total volume delivered during the calendar year.

FIGURE 2-4:
SUMMARY OF HISTORIC AVIATION FUEL DELIVERIES (BVS)



Note: 2002 reflects partial year data (Aug-Dec)

The overall increase in fuel delivery volume between 2003 and 2004 was approximately 15.5%. Aviation gasoline (AVGAS) deliveries increased sharply (+31%) between 2003 and 2004, although current volume is running about 23 percent below 1993 levels. The average volume of AVGAS delivered per based aircraft (piston) at BVS declined from 839 gallons in 1993 to 614 gallons in 2004. Jet fuel deliveries increased 7.9 percent from 2003 to 2004; no jet fuel was available at BVS in 1993.

According to Corporate Air Center, a significant portion of the current volume of jet fuel activity can be attributed to an increasing frequency of itinerant turbine business aircraft operations. This trend has also apparently contributed to a significant increase in the average gallons of fuel sold per

transaction for jet fuel. In addition, BVS currently accommodates regular turbine activity from both locally operated and itinerant turbine aircraft. It is noted however, that the current commercial operator of turbine aircraft at BVS (Empire/FedEx) does not generally purchase fuel at BVS, which highlights the strength of the itinerant turbine activity associated with corporate users.

Local Hangar Utilization

Table 2-8 highlights a significant increase in hangar utilization that has occurred at BVS over the last several years, up from less than 40 percent to about 66 percent currently. A review of the previous airport layout plan and current aerial photography indicates that a large number of new hangars were constructed at BVS between 1995 and 2005. The 1995 Airport Master Plan estimated that there were 58 existing hangar units (during the period 1992-1993). Based on airport building data, it is estimated that there are an estimated 106 hangar storage spaces currently available or under construction. This total reflects the number of individual T-hangar spaces and executive hangars, but does not include FBO hangars or other commercial use hangars. It is also recognized that some of the executive hangars may contain more than one aircraft, but that could not be readily verified. This information indicates that there has been a near doubling of hangar spaces since 1995, although the number of based aircraft has increased by about one-third, suggesting that a large portion of the demand for recent-historic hangar construction was generated by locally-based aircraft that were previously parked on an aircraft apron.

In 2005, the airport had a waiting list of 18 aircraft owners interested in renting hangar space; six of the individuals already located their aircraft at BVS, while the remaining twelve aircraft were located at other airports. A privately owned 10-unit T-hangar was constructed near the west end of Runway 4/22 in late 2005. The hangar units in this development are sold, rather than rented, with 8 of the 10 units being acquired by aircraft owners not currently located at BVS.

TABLE 2-8: BVS BASED AIRCRAFT & HANGAR UTILIZATION (01/05)

	1993	2005
Total Based Aircraft	143	158
Aircraft Stored in Hangars	56	109
Aircraft Parked on Tiedown Apron	87	55
Percentage of Based Aircraft Stored in Hangars	*39%*	*66%*

Source: 1993 data from 1995 Airport Master Plan; 2005 data from airport management records

ASSESSMENT OF EXISTING FORECASTS

A review of existing aviation forecasts for BVS was conducted to identify information that may be useful in projecting future activity. The existing forecasts of based aircraft and aircraft operations are summarized in **Table 2-9** and **Table 2-10** and are depicted in **Figure 2-5** and **Figure 2-6.**

1995 Airport Master Plan (AMP)

The master plan forecasts included both general aviation and commercial aviation elements, including a substantial amount of scheduled commercial air service and air cargo activity. Based aircraft were projected to increase from 143 to 182 (+27%) by 2013, which equals an annual average growth of **1.21 percent**. The current count of 158 based aircraft is 4 aircraft below the master plan forecast for 2003, which tracks reasonably well with projected growth. Total airport operations were projected to increase by 96.8 percent, from 55,230 in 1992 to 108,700 in 2013. This equals an annual average growth of **3.28 percent**.

The master plan preferred forecasts included scheduled passenger service with 5 to 6 daily flights with 10-seat light piston twins starting in 1995, with the addition of 19-passenger turboprop (Metroliner) service by 2003. By the end of the 20-year planning period (2013), the commercial passenger service aircraft fleet mix was forecast at 70%/30% between 10- and 19-passenger aircraft.

WSDOT Aviation System Plan (2000 and 2002 Forecasts)

The most recent Washington Aviation System Plan forecasts were developed in 2000 as part of comprehensive economic study, with projections made from 2000 to 2020. However, the forecasts of based aircraft and operations for BVS reflect nearly flat growth (0.1 to 0.2 percent) through the 20-year forecast period. Based on the airport's historic activity and notably more optimistic forecasts developed for several nearby airports in the same document, it appears that the WSDOT forecasts do not provide an effective measure of future activity at BVS. A 5-year forecast update generated by WSDOT in 2002 indicated significantly higher annual growth for BVS (2.8 to 4.6%) between 2002 and 2005. Although the 2002 based aircraft totals are more consistent with current airport counts, no specific rationale was provided to explain the sharp increase in aircraft operations, nor was it clear how the updated forecasts would be integrated into the 2000-2020 forecasts.

FAA Terminal Area Forecasts (TAF)

The Federal Aviation Administration (FAA) maintains forecasts for BVS in the Terminal Area Forecast (TAF). The TAF for BVS projects no increase in based aircraft or aircraft operations through 2020. When no growth is reflected for an airport in the TAF it indicates that inadequate data exists to support projections beyond current estimates. The TAF currently lists 121 based aircraft and 54,232 annual aircraft operations (static number extending from 2003 to 2020). The FAA will evaluate the updated master plan forecasts for incorporation into the TAF.

TABLE 2-9: 1995 BVS MASTER PLAN FORECASTS

Source	1993	1998	2003	2013
Based Aircraft *(1.21% AAR, 1993-2013)*	143	152	162	182
Aircraft Operations *(3.28% AAR, 1992-2013)*	55,230	76,120	85,570	108,700

Includes both GA local & itinerant, plus commercial activity forecasts.

TABLE 2-10: 2000/2002 WSDOT AVIATION SYSTEM PLAN FORECASTS (BVS)

Source	2000	2002	2005	2010	2015	2020
2000 Forecasts						
Based Aircraft *(0.12% AAR 2000-2020)*	120	--	121	122	122	123
Aircraft Operations *(0.19% AAR, 2000-2020)*[1]	55,132	--	55,800	56,400	56,600	57,300
2002 Forecast Update						
Based Aircraft *(4.59% AAR 2002-2005)*	--	125	143	--	--	--
Aircraft Operations (2.84% AAR 2002-2005)	--	79,900	86,920	--	--	--

1. Includes both GA local & itinerant, plus commercial activity forecasts.

FIGURE 2-5: EXISTING BASED AIRCRAFT FORECASTS (BVS)

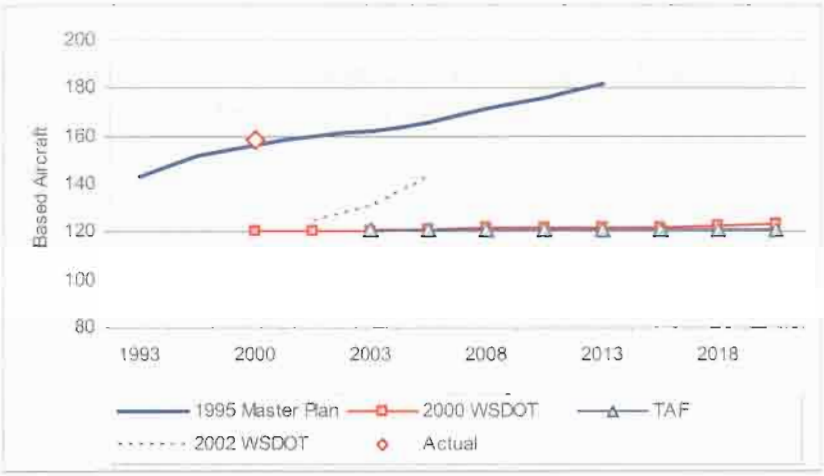
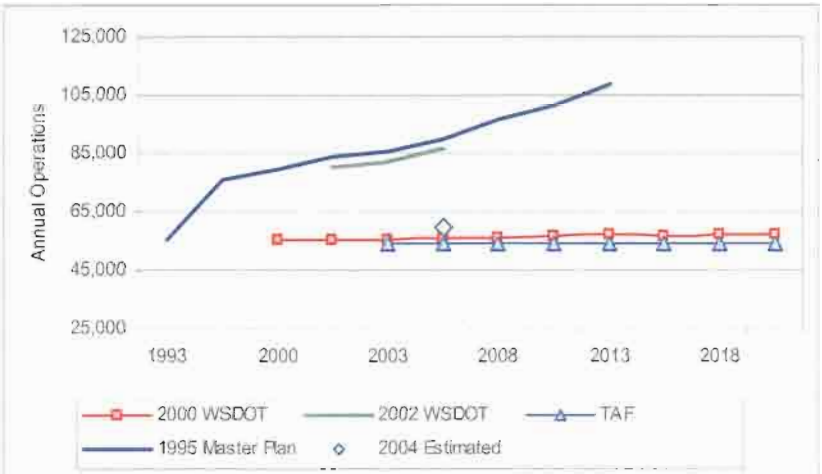


FIGURE 2-6: EXISTING AIRCRAFT OPERATIONS FORECASTS (BVS)



UPDATED FORECASTS

Three forecast scenarios were developed for based aircraft and general aviation operations. Commercial activity (passenger and cargo) was forecast separately. All based aircraft forecasts are based on the current total of 158 aircraft with 8 aircraft added that are expected to relocate the airport in mid-2005 when construction of new 10-unit T-hangar is completed. Based on the limited historical data available from which to build statistical models, projections were developed based on three approaches:

12-Year Historical Trend: Skagit County Population and BVS Based Aircraft. The ratio of county population and based aircraft has remained relatively stable at about 680 residents per based aircraft over the last twelve years. A forecast of based aircraft using a fixed ratio of 680 was developed based on the GMA adopted county population forecast for 2025. A forecast of general aviation local and itinerant aircraft operations for this scenario was developed by applying the FAA-recommended aircraft utilization factor of 350 annual aircraft operations per based aircraft, consistent with medium-activity GA airports. These projections reflect an average annual rate (AAR) of growth of **1.39 percent** between 2005 and 2025.

FAA Long Term Growth Scenario. This scenario applies a composite of several FAA growth rate assumptions used in their long term forecasting of general aviation activity. The selected growth rate is consistent with FAA national forecasts for growth in the general aviation fleet, weighted proportionately based on the distribution of piston and turbine aircraft expected to locate at BVS. Piston aircraft are expected to continue to represent about 85 to 86 percent of locally based aircraft fleet at BVS during the current 20-year planning period. The FAA-recommended aircraft utilization factor of 350 annual aircraft operations per based aircraft was also used in this projection. These projections reflect an average annual rate (AAR) of growth of **1.061 percent** between 2005 and 2025.

WSDOT Aviation NW Region/Market Composite. The WSDOT 2000 Aviation System Plan (Forecast and Economic Analysis Study)[26] contained detailed evaluations of Washington aviation activity, including groupings of several counties into regions. Skagit County was included in the Northwest Region, which also includes Island, San Juan and Whatcom County. The Plan forecast growth in based aircraft in the Northwest Region at approximately **1.8 percent** annually. The relative similarities of the adjoining counties make use of the composite growth rate reasonable for projecting growth in based aircraft at BVS. Based on the potential strength of local market conditions, a slightly higher aircraft utilization rate (375 operations per based aircraft) was applied to project aircraft operations.

The updated forecasts are summarized **Table 2-11, 2-11A, and 2-12** and depicted in **Figures 2-7 and 2-8.** The mid-range forecast (Skagit Population Ratio) is recommended as the preferred forecast scenario; however, given the uncertainty associated with operations data, facility development reserves should be based on the high scenario.

[26] Bucher Willis Ratliff (2000)

TABLE 2-11: COMPARISION OF UPDATED BASED AIRCRAFT FORECASTS (BVS)

	Base Year 2004[1]	2005[2]	2010	2015	2020	2025
Base Year Estimate	158					
FAA Long Term GA Industry Growth Rate (Composite) *(1.06% AAR 2005-2025)*		166	177	189	197	205
Skagit County Population Ratio (1993/2004) *(1.39% AAR 2005-2025)* ***Preferred Mid-Range Projection***		**166**	**182**	**203**	**211**	**219**
Regional/Market Growth (Composite) *(1.796% AAR 2005-2025)*		166	182	198	217	237

1. Base year total reflects 1/27/05 aircraft count (158) provided by airport management
2. 2005 forecast includes 8 new aircraft where owners' have purchased condo T-hangar units currently under construction; these aircraft will relocate to the airport when hangar construction is completed by mid-2005 and are captured within the growth rates used for each forecast.

FIGURE 2-7: 2005-2025 BASED AIRCRAFT FORECASTS (BVS)

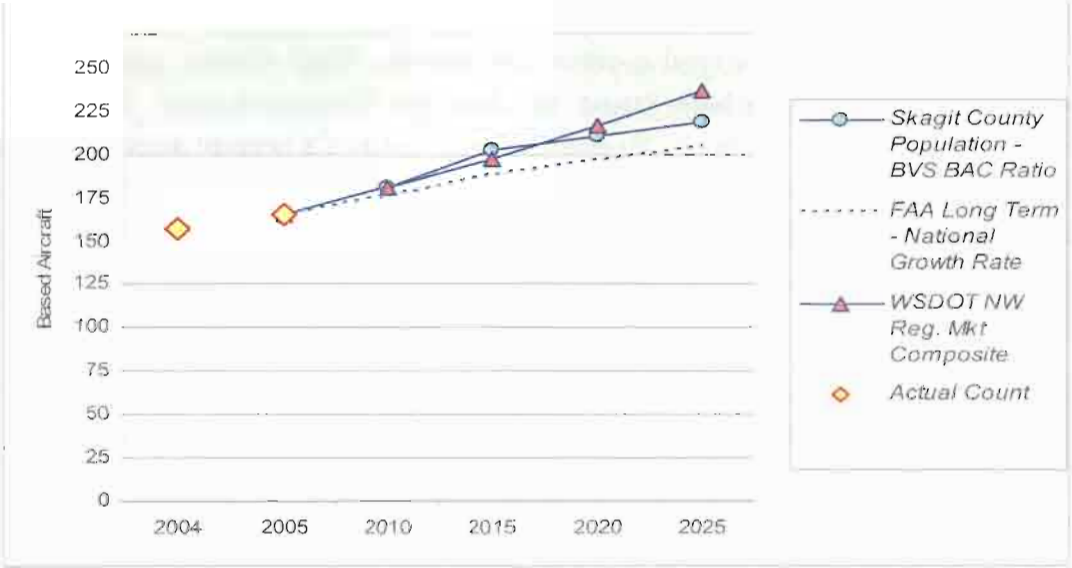


TABLE 2-11A: SUMMARY OF BASED AIRCRAFT FLEET MIX

Aircraft Type	Actual 2004	2005	2010	2015	2020	2025
Single Engine Piston	137 *(87%)*	145 *(87%)*	158 *(87%)*	175 *(86%)*	181 *(86%)*	188 *(86%)*
Multi-Engine Piston	3 *(2%)*	3 *(2%)*	3 *(2%)*	4 *(2%)*	5 *(2%)*	5 *(2%)*
SE/ME Turbine	6 *(4%)*	6 *(4%)*	7 *(4%)*	8 *(4%)*	9 *(4%)*	9 *(4%)*
Turbojet	4 *(3%)*	4 *(3%)*	5 *(3%)*	6 *(3%)*	6 *(3%)*	6 *(3%)*
Rotorcraft	6 *(4%)*	6 *(4%)*	7 *(4%)*	8 *(4%)*	8 *(4%)*	9 *(4%)*
Other	2 *(1%)*	2 *(1%)*	2 *(1%)*	2 *(1%)*	2 *(1%)*	2 *(1%)*
Total Based Aircraft	158 *(100%)*	166 *(100%)*	182 *(100%)*	203 *(100%)*	211 *(100%)*	219 *(100%)*

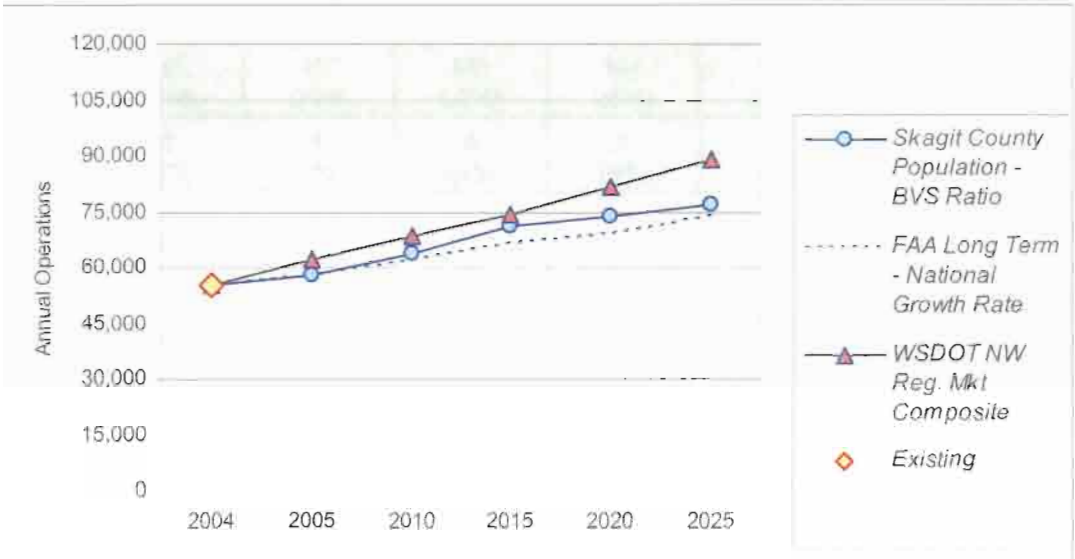
Numbers may not sum due to rounding; percentages rounded to nearest whole percent.

TABLE 2-12: COMPARISION OF UPDATED GA OPERATIONS FORECASTS (BVS)

	Base Year 2004[1]	2005	2010	2015	2020	2025
Base Year Estimate	55,840					
FAA Long Term GA Industry Growth Rate (Composite) *(1.06% AAR 2005-2025)*		58,100	61,950	66,150	68,950	73,800
Skagit County Population Ratio (1993/2004) *(1.40% AAR 2005-2025)* ***Preferred Mid-Range Projection***		**58,100**	**63,680**	**70,875**	**73,804**	**76,732**
Regional/Market Growth (Composite) *(1.796% AAR 2005-2025)*		62,250	68,250	74,250	81,375	88,875

1. Base year activity estimated by David Miller/Century West based on January 2005 airport based aircraft records and FAA recommended activity ratio for medium-activity general aviation airport.

FIGURE 2-8: UPDATED GA OPERATIONS FORECAST (BVS)



Note: Commercial Activity (passenger and cargo) are summarized separately and are not included in the GA operations forecast

Commercial Operations

***A note on Commercial Passenger Activity Forecasts**: As noted above, scheduled commercial passenger air service at BVS was terminated in mid-2005. However, for planning purposes, the forecasts of commercial passenger activity originally developed in early 2005 have not been modified based on a reasonable expectation that scheduled service will resume in the forecast period and reach the modest levels forecast by the 2015 to 2020 timeframe.*

Skagit Regional has historically accommodated a variety of air taxi and cargo activity, including scheduled and charter passenger flights, daily cargo flights and other air cargo activity. As noted earlier, the 1995 master plan forecast of commercial passenger service represented a significant portion of future activity with increasingly larger aircraft.

Based on the current state of the regional airline industry, a narrowed market focus (toward larger markets and larger capacity regional aircraft) and the marginal financial health of the airline industry in general, establishing service into new smaller markets by established air carriers appears unlikely for the foreseeable future. However, an increasing number of carriers now offering scheduled service under FAR Part 135 with aircraft such as the Cessna Caravan or other turboprops that have been

phased out of the regional airline fleet in favor of regional jets or large-capacity turboprops may provide a business model that is compatible with the local air service market. It is difficult to predict what changes may occur in small market air service over the next twenty years. However, given the economics involved, the use of smaller capacity aircraft appears to be the most viable option. Since there is no clear expectation that scheduled air service would be reestablished in the near future, previous forecasts of scheduled commuter airline service have been modified to reflect the 8-passenger and small aircraft service that can be provided by FAR Part 135 carriers. Carriers operating aircraft with 9 seats or greater are certificated under FAR Part 121. Airports served by certificated air carriers are required to be certified as commercial airports under FAR Part 139.

Passenger Service

In late 2004, Kenmore Air Express began offering scheduled passenger service from BVS to Seattle (Boeing Field) with 8-passenger Cessna Caravan turboprop aircraft. This service was terminated in mid-2005, which coincided with Kenmore purchasing San Juan Airlines. Future plans to resume service at BVS are not known at this time.

Potential for expansion of commercial passenger service within the region is recognized for both Bellingham International Airport (BLI) and Paine Field in Everett. BLI's 2003 Airport Master Plan predicts passenger enplanements will increase from about 97,000 to 151,000 by 2022. A 2004 air service study conducted for Paine Field identified their market potential at more than 2.8 million annual enplanements. The local Burlington/Mt. Vernon area is located within the passenger "catchment" area defined for Paine Field. Based on the potential for airline service both to the north and south of the local area, expansion of commercial air service at BVS is expected to be largely related to service to the San Juan Islands and feeder service related to SEATAC, such as the service previously provided by Kenmore Air via Boeing Field.

BVS also accommodates a moderate amount of air taxi charter activity. According to the owner of Corporate Air Center, BVS regularly accommodates business jet aircraft that are unable to land at the airports in the San Juan Islands. In these cases, the passengers often transfer to a smaller charter aircraft and fly to the islands or are transported to Anacortes by vehicle to access the state ferry or private boat.

Forecasts of scheduled commercial passenger service have been prepared and are summarized in **Table 2-13**. Three demand scenarios were created based on anticipated levels of service and the uncertainty associated with maintaining economically viable scheduled service in small communities. For planning purposes, the mid-range projection is recommended as the preferred forecast.

TABLE 2-13: SCHEDULED COMMERCIAL PASSENGER FORECASTS (BVS)

	2005	2010	2015	2020	2025
Low Scenario Aircraft Operations					
5-Passenger Aircraft *(C206/C207 typical)*	0	0	0	0	0
8-Passenger Aircraft *(C208B typical)*	1,080	1,164	1,254	1,350	1,456
Total Air Taxi/Commuter Scheduled Passenger Operations	1,080	1,164	1,254	1,350	1,456
Mid-Range Scenario Aircraft Operations *(Preferred Forecast)*					
5-Passenger Aircraft *(C206/C207 typical)*	676	900	970	1,046	1,126
8-Passenger Aircraft *(C208B typical)*	1,080	1,164	1,254	1,350	1,454
Total Air Taxi/Commuter Scheduled Passenger Operations	1,756	2,064	2,224	2,396	2,580
High Scenario Aircraft Operations					
5-Passenger Aircraft *(C206/C207 typical)*	1,080	1,440	1,550	1,670	1,800
8-Passenger Aircraft *(C208B typical)*	1,728	1,862	2,006	2,160	2,328
Total Air Taxi/Commuter Scheduled Passenger Operations	2,808	3,202	3,556	3,830	4,128
Passenger Enplanement Forecasts *(Mid-Range Scenario)*					
Total Departures	878	1,032	1,112	1,198	1,290
Outbound Seats Available	6,008	6,906	7,437	8,013	8,633
Enplaned Passengers *(assumes 50% boarding factor)*	**3,004**	**3,453**	**3,719**	**4,006**	**4,316**

Air Cargo & Express

The current level of package carrier aircraft activity at the airport is expected to remain steady during the planning period. The use of typical single and multi-engine turboprop aircraft (i.e., Cessna Caravan, Beech 1900, etc.) is also expected to continue. Methow Aviation and Aeronautical Services, two cargo operators that have historically operated at BVS, have curtailed or ended

operations altogether. A limited amount of cargo activity may be expected from a variety of nonscheduled carriers.

The 1995 master plan estimated cargo volume in 1992 at 1,775 tons (enplaned only), which equals an average of more 9,700 pounds per day. A survey of air cargo activity was conducted by airport management in January 2001, which documented enplanement data for 1999: 1,443 tons of enplaned freight and 172 tons of enplaned mail.

The current level of FedEx Caravan operations is approximately 1,060 per year, based on two daily flights, with some increase during peak periods. Based on the current level of FedEx service and the significant reductions in other cargo flights (Aeronautical Services and Methow Aviation), cargo volume at BVS is believed to have declined significantly from earlier peaks. No changes in the current express flight frequency or aircraft type are anticipated in the near future, although some level of air freight and mail service by air taxi operators is expected to continue at substantially lower levels than in past years.

Instrument Operations

The FAA TAF does not list any instrument operations at BVS in any historic or forecast year due inadequate data (listed at a static 0 through 2020). However, according to data contained in the WSDOT Aviation System Plan Forecasts (2000), instrument meteorological conditions (IMC) prevail approximately 13 percent of the time in western Washington. With the existing mix of based aircraft, itinerant flight activity, including commercial passenger and cargo operators, and the existing instrument approach capabilities at BVS, the level of instrument operations would be expected to be relatively high. The methodology used in the system plan to estimate instrument operations applies the percentage of IMC (13.1%) to 46.1 percent of general aviation itinerant operations (based on the percentage of instrument rated pilots), plus 100 percent of commercial operations. A summary of forecast instrument operations for BVS is included in **Table 2-14**.

Forecast Summary

The updated forecast of aviation activity at BVS is summarized in **Table 2-14**. Additional calculations of activity peaking and fleet mix are provided in **Table 2-15** and **2-16**. The projected forecast mix for aircraft operations will remain relatively similar to current distributions, although the percentage of turbine operations is expected to increase from about 5 to 8.5 percent during the 20-year planning period. An analysis of critical aircraft, airport reference code, and weight analysis

based on the preferred forecast is provided in **Appendix C**. A 50-year extrapolation of the preferred forecast is summarized in **Table 2-17.**

The preferred forecast of based aircraft represents an annual average growth rate of **1.77 percent** over the twenty-year planning period, although growth early in the planning period reflects the short-term increase expected to result from current hangar construction. After accounting for hangar construction, growth in based aircraft increases at an annual average rate of **1.47 percent**.

Aircraft operations are also forecast to increase at an average annual rate of **1.77 percent** during the planning period, which reflects stable aircraft utilization levels at the airport. The breakdown between local and itinerant operations is projected to remain stable at approximately 40/60 percent, respectively.

The combination of all ADG II aircraft activity (Approach Categories A-D) is already well above the level required to define critical aircraft (based on wingspan). This warrants use of ADG II for Runway 10/28 and the associated facilities. The ADG II activity currently accounts for approximately 4.6 percent of overall operations at BVS; this percentage is expected to increase slightly, to about 7.9 percent by the end of the 20-year planning period.

Itinerant business jet activity at BVS is expected to increase during the 20-year planning period. This assumption is based on a variety of factors including the quality of services available to corporate aircraft currently using BVS, nationally-forecast growth in business jet travel, increased demand for travel to the local area and the adjacent San Juan Islands, and the ability of BVS facilities to effectively accommodate demand. A portion of this traffic consists of larger and faster aircraft included in Aircraft Approach Category C or D (approach speeds ranging from 121 to 165 knots). It is estimated that this segment of activity currently represents less than 0.5 percent of total airport operations. Although the level of Category C and D operations is expected to remain at or below 1 percent through the planning period, the absolute number of operations is expected to reach, and then exceed the FAA-standard (for definition of design aircraft) of 500 annual itinerant operations near the mid-point of the 20-year planning period. For planning purposes, Approach Category D aircraft will be used as the future design aircraft, which from an airfield design perspective is generally representative of both Approach Category C and D aircraft.

Therefore, based on existing and forecast aircraft activity levels, the current Airport Reference Code (ARC) recommended for Runway 10/28 and associated facilities is B-II (ARC: B-II). The future ARC recommended for Runway 10/28 is D-II. Runway 4/22 is expected to continue to serve small single-engine and twin-engine aircraft included in ADG I. A more detailed discussion of design aircraft considerations is provided in the Facility Requirements Chapter.

The preferred forecasts are also presented in the specific spreadsheet formats required for comparison with the FAA Terminal Area Forecasts (TAF) (see **Appendix A**); operational analysis by airport reference code (ARC) and aircraft weight (see **Appendix B**); and 50-year land requirements (see **Appendix C**).

TABLE 2-14: SUMMARY OF OPERATIONS BY ACTIVITY CATEGORY

	Existing 2004	2005	2010	2015	2020	2025
Itinerant Operations						
General Aviation	33,180	34,860	38,208	42,525	44,282	46,039
Commercial	2,000	3,280	3,704	3,993	4,295	4,630
Military	100	100	100	100	100	100
Total Itinerant	35,280	38,240	42,012	46,618	48,677	50,769
Local Operations	22,120	23,240	25,472	28,350	29,522	30,693
Total Operations	**57,400**	**61,480**	**67,484**	**74,968**	**78,199**	**81,462**
Subtotal Airplane Design Group II Operations (All Approach Categories Combined)	2,646	3,757	4,493	5,608	6,190	6,448
Subtotal Aircraft Approach Category D Operations	258	277	344	450	528	550
Design Aircraft - Airport Reference Code (ARC)	B-II	B-II	B-II	B-II	D- II	D- II
Typical Stage Length	<500 miles	<500 miles	<500 miles	<500 miles	<500 miles	<500 miles
Instrument Operations	2,270	2,540	2,790	3,090	3,240	3,400

TABLE 2-15: SUMMARY OF OPERATIONS BY AIRCRAFT TYPE

Aircraft Type	Actual 2004	2005	2010	2015	2020	2025
Single Engine Piston	50,512 *(88%)*	53,180 *(87%)*	58,036 *(86%)*	63,469 *(85%)*	66,489 *(85%)*	69,243 *(85%)*
Multi-Engine Piston	1,722 *(3%)*	1,844 *(3%)*	1,957 *(2.9%)*	2,099 *(2.8%)*	2,111 *(2.7%)*	2,118 *(2.6%)*
Single Engine Turbine	1,148 *(2%)*	2,152 *(3.5%)*	2,497 *(3.5%)*	3,000 *(4%)*	3,128 *(4%)*	3,258 *(4%)*
ME Turbine (Turboprop/Turbojet)	1,722 *(3%)*	1,844 *(3%)*	2,294 *(3.4%)*	2,999 *(4%)*	3,441 *(4.4%)*	3,666 *(4.5%)*
Rotorcraft	2,296 *(4%)*	2,459 *(4%)*	2,699 *(4%)*	2,999 *(4%)*	3,050 *(3.9%)*	3,177 *(3.9%)*
Total Operations	**57,400** *(100%)*	**61,480** *(100%)*	**67,484** *(100%)*	**74,968** *(100%)*	**78,199** *(100%)*	**81,462** *(100%)*

Numbers may not sum due to rounding.

TABLE 2-16: SUMMARY OF PEAK DEMAND

Activity Measure	Actual 2004	2005	2010	2015	2020	2025
Annual Operations	57,400	61,480	67,484	74,968	78,199	81,462
Peak Month *(= 10% of Annual Ops.)*	*5,740*	*6,148*	*6,748*	*7,497*	*7,820*	*8,146*
Design Day (Design Day/31 days)	*185*	*198*	218	242	252	263
Design Hour (15% of Design Day)	28	30	33	36	38	39

TABLE 2-17: 50 YEAR OPERATIONS FORECAST (EXTRAPOLATION)

Activity Measure	2005	2025	2035	2045	2055
Based Aircraft	166	219	252	289	332
Annual Operations	57,400	81,462	97,049	115,618	137,736
Peak Month (= 10% of Annual Ops.)	*5,740*	*6,148*	*9,705*	*11,562*	*13,774*
Design Day (Design Day/31 days)	*185*	*198*	*313*	*373*	*444*
Design Hour (15% of Design Day)	*28*	*30*	*47*	*56*	*67*

Chapter Three

Airport Facility Requirements

CHAPTER THREE
AIRPORT FACILITY REQUIREMENTS

INTRODUCTION

This evaluation uses the results of the inventory and forecasts contained in Chapters One and Two, as well as established planning criteria, to determine the airside and landside facility requirements through the current twenty-year planning period. Airside facilities include runways, taxiways, navigational aids and lighting systems. Landside facilities include hangars, fixed base operator (FBO) facilities, aircraft parking apron, aircraft fueling, automobile parking, utilities and surface access.

The facility requirements evaluation is used to identify the adequacy or inadequacy of existing airport facilities and identify what new facilities may be needed during the planning period based on forecast demand. Potential options for providing these facilities will be evaluated in Chapter Four (Alternatives), to determine the most cost effective and efficient means for implementation.

It is important to note that the benefits of the original airfield configuration and subsequent efforts to protect for larger aircraft use and/or precision instrument approach capabilities at BVS are clearly visible today. Through the application of conservative development setbacks, large protected areas currently exist that will enable significant facility upgrades to occur with minimal reconfiguration of existing development.

This chapter provides a comprehensive evaluation of a wide range of facility needs and applicable FAA planning and design standards. For convenience of the reader, an executive summary of major facility needs is provided in **Table 3-0.** Short-term needs are anticipated within the first ten years of the planning period; long-term needs are anticipated beyond ten years. Detailed information about each of these items can be found in the chapter.

TABLE 3-0: EXECUTIVE SUMMARY OF 2005 AIRPORT MASTER PLAN FACILITY REQUIREMENTS

RUNWAY 10/28

CURRENT: UPGRADE MARKINGS TO NON PRECISION INSTRUMENT (NPI)

SHORT TERM: INCREASE PAVEMENT STRENGTH FOR DESIGN AIRCRAFT (TYPICAL MEDIUM BUSINESS JET); EVALUATE SAFETY AREA SURFACE COMPACTION AND PRIMARY SURFACE TERRAIN CLEARANCES

LONG TERM: RESERVE AREA FOR POTENTIAL RUNWAY EXTENSION NEEDS (BEYOND 20 YEAR PLANNING PERIOD); UPGRADE MARKINGS TO PRECISION INSTRUMENT

RUNWAY 4/22

MAINTAIN EXISTING CAPABILITIES; CORRECT RUNWAY END MARKINGS; SHIFT RUNWAY 90 FEET NORTH AND SHIFT APPROXIMATELY 400 FEET WEST TO MEET DESIGN STANARD AND ALLOW DEVELOPMENT IN "LOT 72." DEVELOP TURF SHOULDER ON NORTH SIDE OF RUNWAY.

TAXIWAYS

SHORT TERM: RECONFIGURE TAXIWAY B; ADD/EXPAND AIRCRAFT HOLDING AREAS (RWY 28 AND 22 ENDS); EXTEND TAXIWAYS/TAXILANES TO NEW LANDSIDE FACILITIES; NARROW TAXIWAY F TO 35 FEET.

LONG TERM: EXTEND TAXIWAYS/TAXILANES TO NEW LANDSIDE FACILITIES.

AIRCRAFT APRON

CURRENT: RECONFIGURE PARKING FOR ITINERANT BUSINESS AIRCRAFT AND HELICOPTER PARKING AND TERMINAL AREA LOADING/UNLOADING; NEW AIRCRAFT FUEL STORAGE AND DISPENSING AREAS (10/28 AND 4/22 FLIGHTLINES)

SHORT TERM: DEFINE LARGE AIRCRAFT PARKING POSITIONS (INCREASE PAVEMENT STRENGTH); EXTEND 10/28 FLIGHTLINE (EAST END); AIRCRAFT WASH RACK; RECONFIGURE EXISTING FUEL ISLAND AREA FOR AIRCRAFT PARKING.

LONG TERM: AIRCRAFT PARKING RESERVES

TABLE 3-0: (CONTINUED) EXECUTIVE SUMMARY OF 2005 AIRPORT MASTER PLAN FACILITY REQUIREMENTS

HANGARS

CURRENT: EXISTING HANGAR LEASE LOTS AVAILABLE

SHORT TERM: 10-YEAR FORECAST DEMAND: +40 AIRCRAFT

LONG TERM: 20-YEAR FORECAST DEMAND: +12 AIRCRAFT (+52 NET INCREASE)

ESTABLISH HANGAR DEVELOPMENT RESERVES (EQUAL TO 100 PERCENT OF 20-YEAR FORECAST DEMAND)

AIRFIELD LIGHTING AND INSTRUMENTATION

SHORT TERM: NONE (RNAV (GPS) RWY 10 APPROACH COMMISSIONED IN 2006 WITH LPV, LNAV/VNAV/)

LONG TERM: PAPI (RWY 10 & 28); MALS-R (IN CONJUNCTION WITH FUTURE PRECISION INSTRUMENT APPROACH ON RUNWAY 10 OR 28); ILS OR LAAS GPS APPROACH.

MISCELLANEOUS (FENCING, ACCESS, UTILITIES)

CURRENT: ACCESS ROAD (ON-AIRFIELD VEHICLE ACCESS BETWEEN FLIGHTLINES - COMPLETED IN 2006); AIRCRAFT WASH RACK.

SHORT TERM: REMOVE UST (AVGAS & JET FUEL TANKS); EXTEND FENCING & CONTROLLED ACCESS TO NEW LANDSIDE DEVELOPMENT AREAS.

LONG TERM: AIRPORT PERIMETER FENCING; ACCESS ROAD IMPROVEMENTS TO NEW LANDSIDE AREAS.

1995 Airport Master Plan Overview

The 1995 Airport Master Plan recommended a variety of facility improvements at BVS for the 20-year planning period that extended through 2013. The major planning assumptions focused on a significant upgrade in design aircraft and instrumentation for Runway 10/28. The majority of new landside development at BVS was planned along the Runway 3/21 (now 4/22) flightline.

The 1995 Airport Layout Plan identified transport category aircraft (initially Boeing 727-100, then changed to Fokker F-27) as the ultimate design aircraft for Runway 10/28. These aircraft are included in Airplane Design Group III, with Approach Categories B (F27) and C (B727). Based on current expectations and updated forecasts prepared in this master plan update, the future design aircraft is now identified as a large business jet included in Approach Category C or D and Airplane Design Group II (ARC D-II). This assumption is based on the airport's ability to

accommodate a range of medium and large business jet aircraft. It is significant to note that many of the design standards for D-II and B-III runways are identical, which suggests that Runway 10/28 could accommodate limited ADG III activity. Existing runway length and pavement strength would limit transport category aircraft operations at BVS more than other airfield design elements.

The projects summarized in **Table 3-1** were included in the previous master plan's 20-year capital improvement program (CIP). The projects were reviewed to identify those, which have been completed (noted in the table). The previously recommended facility improvements, which have not been implemented, will be revalidated, modified or eliminated based on the updated facility needs assessment and FAA guidelines.

Please note that all prior references to "Runway 3/21" projects now relate to Runway 4/22. Runway end numbers represent the approximate magnetic heading for a runway (+- 5 degrees). Due to gradual changes in the earth's magnetic declination, runway numbers occasionally require an adjustment to the next 10-degree increment.

The majority of recommended short-term projects (1995-1999) were completed, although several changes in facility layouts along the Runway 3/21 flightline were made as development progressed. Much of the focus on the intermediate and long-term capital improvement program was related to improvements associated with upgrading the lighting and instrument approach capabilities of Runway 10/28. The majority of these projects have not been completed. Private hangar construction on the airport during the last ten years has exceeded the amount of new construction depicted on the 1995 Airport Layout Plan drawing.

TABLE 3-1: SUMMARY OF 1995 AIRPORT MASTER PLAN RECOMMENDED PROJECTS AND CURRENT STATUS

Completed? Yes/No	Projects
Yes	3/21 Flightline Phase I: Fencing
Yes	3/21 Flightline Phase I: Access Road & Utilities *(Crosswind Drive)*
Yes	Runway 10/28 REILS
Yes	Cargo Apron
Yes	Replace Airport Rotating Beacon
Yes	Construct Hangars *(*private construction on 3/21 (now 4/22) flightline has occurred in a different configuration than shown in MP Exh.10-2)*
Yes	3/21 Flightline: Access Road & Fencing (Phase II)

TABLE 3-1 (CONTINUED)
SUMMARY OF 1995 AIRPORT MASTER PLAN
RECOMMENDED PROJECTS AND CURRENT STATUS

Yes	Flightline Access Taxiway *(Taxiway G – East 1,500 feet)*
Yes	Hangar Taxiways & Apron *(Tiedown Apron F and 4 hangar taxilanes constructed)*
No*	Rwy 3/21 and Taxiway Reflectors *(*edge lighting was installed rather than reflectors)*
Yes	Terminal Area Security Fencing/Gates
Yes	Phase 3 Terminal Drive and Parking
No	Runway 28 MALSR
No	Runway 10/28 PIR Markings
No	Field Perimeter Fencing
Yes*	Secured Terminal Area Parking (70 spaces) *(*Approximately 98 new vehicle parking added between Higgins-Airport Way and Terminal Loop roadway)*
Yes	Access Road Extension *(Rwy 4/22)*
Yes	Apron Lights and Fencing *(Rwy 4/22 – east end)*
No	Wetland Mitigation for RSA (Rwy 10 end)
Yes	Runway Visibility Zone Clearing *(east corner of infield trees)*
No	Runway 10/28 RSA/OFA Improvements *(associated with upgrade to ADG III)*
Yes	3/21 Flightline Phase II: Taxiway Construction *(Taxiway G – West 1,500 feet)*
Yes	3/21 Flightline Phase II: Roadway Extension *(Crosswind Drive)*
Yes*	Tiedown Apron and Access Taxiways *(*2 additional hangar taxilanes constructed; FBO apron currently under construction near Rwy 4 end)*
No	Runway 10/28 and Taxiway A Overlay
No	Runway 10 MALSR
No	Obstruction Removal *(to protect 50:1 approach surfaces)*
No	SR20/Higgins Roadway Signalization
Yes	Construct Hangars *(*private hangar construction on both flightlines has occurred)*
No	Construct Cargo Hangar
No	Terminal Building Expansion
No*	3/21 Flightline Phase III: GA Apron Construction, Access Taxiways. *(FBO apron currently under construction near Rwy 4 end)*
No	2nd Roadway Construction *(South airport access via Ovenell Road)*
No	Runway 10/28 Lighting Reconstruction
No	Runway 3/21 Maintenance Overlay
Yes*	Runway 10/28 and Taxiway A Seal Coat *(*Runway seal coated in 1999)*

In addition to the master plan-recommended items completed, several other projects have been completed since 1995:

- Runway 3/21 (now 4/22) was reconfigured from 5,081 x 150 feet to 3,000 x 60 feet with basic runway markings;
- Precision approach path indicators (PAPI) installed on Runway 4/22;
- Taxiway G (Rwy 4/22 Parallel Taxiway) constructed;
- Upgrade/Retrofit existing UST for Jet Fuel; card lock added;
- Installation of one private aboveground fuel storage tank with card lock;
- Private development of FBO hangar and facilities at east end of 10/28 flightline;
- Various pavement maintenance projects (seal coats, etc.);
- Stormwater and other utility upgrade projects;
- Purchase of 4.98 acres (Van Pelt property) in Runway 28 Protection Zone;
- Purchase of 17.78 acres (Bouslog property) in Runway 28 Protection Zone;
- Construct Aviation Fuel Storage Facilities (Rwy 4/22 & 10/28 flightlines); and
- Construct Airport Access Road (east connection for Runway 10/28 & 4/22 flightlines).

Turf Runway

Note: Following the review of the April 2005 Facility Requirements Working Paper, the Port of Skagit and FAA met to discuss the turf runway proposal. Through this process, the original FAA recommendation that the turf area be developed as a separate, designated runway, as noted below, was eliminated in favor of providing an extended turf shoulder adjacent to the edge of Runway 4/22. Based on this decision, the turf area will not require separate protected areas or protected FAR Part 77 airspace surfaces, as noted in the original draft working paper. In order to preserve to the historical sequence of the planning and decision making process, the original analysis provided in this section has not been modified. However, the previously-identified facility requirements for the turf runway that were originally presented elsewhere in working paper have been eliminated to avoid confusion.

In 2003, the Port submitted a request to the FAA to review the proposed development of a new turf landing area at BVS.[27] As originally proposed, a turf landing area was to be located near the end of Runway 28, along the north side of Runway 10/28, between Taxiways B and C. Through subsequent coordination between the Port and FAA, a revised proposal was submitted to FAA in July 2004 to develop a 1,600-foot long turf runway directly adjacent to Runway 4/22, on its north

[27] FAA Form 7480-1, Notice of Landing Area Proposal, dated 11/14/03.

side.[28] As proposed, the turf runway would extend from the end of Runway 4 to the approximate mid-point of the paved runway, opposite the existing cargo apron and mid-runway exit taxiway. Upon completion of its review of airspace and air safety, the FAA indicated that they had no objection to the proposal based on two conditions being met.[29] The first condition was the relocation of the PAPI to the right side of Rwy 4; the second requirement was that the turf runway and the adjacent paved runway be designated "left" and "right." Based on this direction, the designation of the existing paved runway will need to be changed from Runway 4/22 to Runway 4R/22L when the new turf runway (4L/22R) is activated.

A future turf runway was not identified on the 1995 airport layout plan drawing; the updated plans will reflect the most recent proposed runway configuration reviewed by FAA. As a runway intended for use by small aircraft, the use of airport reference code (ARC) A-I (small aircraft exclusively) is recommended. The A-I design standards are virtually identical to the B-I (small) standards recommended for Runway 4/22, but at a length of 1,600 feet, use of the turf runway would be limited to only the smallest (approach category A) single-engine aircraft.

Since the turf and paved parallel runways will directly abut each other with centerlines approximately 80 feet apart, simultaneous operations will not be permitted. Required runway clear areas such as object free area, safety area, and obstacle free zones will be established for both runways on each centerline. Although many of the defined clear areas for each runway will overlap, no significant conflicts are anticipated. However, aircraft operating on either runway will be located within the clear area (particularly the RSA and OFZ) for the adjacent runway; therefore, only one aircraft should be permitted to operate, taxi or hold on either runway at any time.

Airspace

The 1995 Airspace Plan depicts Runway 10/28 as an "other-than-utility" runway (designed for aircraft weighing 12,500 pounds and above) and Runway 3/21 (now designated 4/22) as a "utility" runway (designed for aircraft weighing less than 12,500 pounds).

Airspace planning for Runway 10/28 was based on a future (ultimate) upgrade to precision instrument approaches on both runway ends. Airspace planning for Runway 3/21 was based on existing and future visual approach capabilities. No areas of tree/terrain penetration were identified within the airport's airspace surfaces on the 1995 Airspace Plan; however, a 1999

[28] FAA Form 7480-1, Notice of Landing Area Proposal, dated 7/6/04.
[29] Correspondence; Karen Miles, FAA Seattle ADO to Jerry Heller, Executive Director, Port of Skagit (9/9/04)

National Ocean Service (NOS) Airport Obstruction Chart (OC) for BVS identifies large areas of trees/terrain penetrating various airspace surfaces.[30] The obstruction data contained on previous versions of the OCs (Editions 1 through 3) does not appear to have been included in the 1995 Airspace Plan. The obstruction survey data will be reviewed and incorporated into the updated airspace drawings being prepared for this project.

It is noted that the runway use and approach assumptions that were used to define the parameters of the obstruction survey differ from both past master plan recommendations and current capabilities. The OC depicts an existing 34:1 (nonprecision) and a future 50:1 (precision) approach surface for Runway 10. All other runway ends have 20:1 (visual) approach surfaces depicted. Based on the existing straight-in nonprecision instrument approach to Runway 28, a 34:1 approach slope is required and should be surveyed and protected. In addition, the OC assumed that Runway 3/21 was an "other-than-utility" runway with a 500-foot wide primary surface. Based on the runway's dimensions, it is limited to small aircraft only, which would require a 250-foot wide primary surface to be protected.

Instrument Approach Capabilities

BVS currently accommodates day and night operations in visual flight rules (VFR) and instrument flight rules (IFR) conditions. Runway 10/28 is the instrument runway at BVS with three nonprecision straight-in approaches,[31] including two approaches based on the Global Positioning System (GPS). Both runway ends are equipped with runway end identifier lights (REIL). The 1995 ALP and associated drawings identified future precision instrument landing system (ILS) approaches for both ends of Runway 10/28. Future medium intensity approach light systems (MALSR) are also depicted for Runway 10 and 28.

Satellite Navigation (SATNAV) Technology

In recent years, the ongoing evolution of satellite-based navigation (SATNAV) technology has led to the development of systems able to provide precision instrument approach capabilities nearly comparable to conventional ground-based ILS systems. Currently, the FAA is developing instrument approaches based on the Wide Area Augmentation System (WAAS). WAAS uses a

[30] Skagit Regional Airport – Airport Obstruction Chart (OC), 4th Edition: Field Survey June 1997; Published June 1999, National Ocean Service (NOS), U.S. Department of Commerce.

[31] Runway 28 GPS has been temporarily taken out of service, pending obstruction review.

network of ground reference stations that monitor Global Positioning System (GPS) satellite signals. WAAS allows GPS signal accuracy to improve from 20 meters to approximately 1.5 to 2 meters. This has allowed development of instrument approaches with both vertical and horizontal guidance. The vertical guidance component (LPV) enables aircraft to descend as low as 250 feet above the runway with visibility minimums of ¾ mile. The FAA indicates that the next phase of WAAS is scheduled to begin in 2008, with implementation of the Global Navigation Satellite System Landing System (GLS). With GLS, improved approach minima are anticipated.

Note: The recently-commissioned RNAV (GPS) is a WAAS-based instrument approach for Runway 10 includes a vertical guidance component (LPV) that reduces GPS approach minimums from 700 feet MSL to 497 feet MSL.

The FAA is also in the early stages of implementing the Local Area Augmentation System (LAAS), which couples ground-based components with the GPS to provide a highly accurate signal with sufficient integrity required to support Category I through III precision approaches. The LAAS system typically includes a ground facility (LGF) consisting of four receivers and antenna pairs with redundant very-high frequency data broadcast (VDB) equipment. One significant advantage of LAAS is that a single unit can support approaches to multiple runways. In addition, curved approaches can be developed.

The expectation is that while some conventional ILS installations may continue to occur on a limited basis (such as the recent installations at Wenatchee and The Dalles), largely through Congressional appropriations, the majority of future precision instrument approaches will be based on WAAS, LAAS, or a comparable GPS-based system.

It is important to note that the FAA has yet to significantly update its airspace planning criteria (FAR Part 77) based on development of new SATNAV systems. As a result, under current FAR Part 77 standards, airspace planning for any type of precision approach capabilities (satellite or conventional) remains the same. Future revisions in airspace planning may be required if items such as curved approach surfaces are incorporated into FAR Part 77 standards.

Considering the technological advances in navigational aid systems, it would be prudent to continue protecting both ends of Runway 10/28 for future precision instrument approaches, as previously depicted in the 1995 Airspace Plan. Runway 4/22 will maintain visual approaches for both its current and future configurations.

Runway Wind Coverage

The FAA recommends that primary runways accommodate at least 95 percent of local wind conditions; when this level of coverage is not provided, the FAA recommends development of a secondary (crosswind) runway.

According to the wind rose depicted on the 1995 ALP, Runway 10/28 (primary runway) can accommodate both large and small aircraft operations in approximately 99 percent of local wind conditions. During the period that BVS was originally constructed, it was common practice for airports to have multiple runways to take advantage of a variety of local wind conditions. However under current FAA guidelines, secondary runways are not normally eligible for FAA funding when the primary runway meets or exceeds the 95 percent coverage threshold, as is the case with Runway 10/28.

A runway's wind coverage is measured by an aircraft's ability to operate with a "direct" crosswind, which is defined as 90 degrees to the direction of travel. For runway planning purposes, the maximum direct crosswind for small aircraft is 12 miles per hour; for large aircraft, a maximum 15-mile per hour direct crosswind is used. Aircraft are able to operate safely in progressively higher wind speeds as the crosswind angle decreases and the wind direction turns more closely to the direction of flight. Ideally, an aircraft will takeoff and land directly into the wind.

The wind rose indicates that crosswinds exceeding typical aircraft capabilities on Runway 10/28 accounted for approximately 0.6 to 1.1 percent (for large and small aircraft) of the local observations (based on 24 observations per day for 3 years). For small aircraft, about half of these wind conditions fall within the capabilities of Runway 4/22. About 0.65 percent of all wind conditions fall outside the 12-mile per hour direct crosswind capabilities of either runway. In such conditions, aircraft operations would not be advised, although that decision is the responsibility of each pilot. It is recognized that varying pilot skill levels and aircraft capabilities dictate how much crosswind is considered acceptable for any particular operation.

Airport Design Standards

The selection of the appropriate design standards for airfield facilities is based primarily upon the characteristics of the aircraft that are expected to use the airport. The most critical characteristics are the approach speed and wingspan of the design aircraft anticipated for the airport. The **design aircraft** is defined as the most demanding aircraft type operating at the airport (or runway) with a minimum of 500 annual itinerant operations.

Federal Aviation Administration (FAA) **Advisory Circular (AC) 150/5300-13, Airport Design**, serves as the primary reference in planning airfield facilities. **FAR Part 77, Objects Affecting Navigable Airspace**, defines airport imaginary surfaces which are established to protect the airspace immediately surrounding a runway. The airspace and ground areas surrounding a runway should be free of obstructions (i.e., structures, parked aircraft, trees, etc.) to the greatest extent possible.

FAA **Advisory Circular 150/5300-13** groups aircraft into five categories based upon their approach speed. Categories A and B include small propeller aircraft, many small or medium business jet aircraft, and some larger aircraft with approach speeds of less than 121 knots. Categories C, D, and E consist of the remaining business jets as well as larger jet and propeller aircraft generally associated with commercial and military use; these aircraft have approach speeds of 121 knots or more. The advisory circular also establishes six aircraft design groups, based on the physical size (wingspan) of the aircraft. The categories range from Airplane Design Group (ADG) I, for aircraft with wingspans of less than 49 feet, to ADG VI for the largest commercial and military aircraft. A summary of typical aircraft and their respective design categories is presented in **Table 3-2.** FAA Airport Design Forms were prepared for both runways at BVS and are included in **Appendix D**.

TABLE 3-2: TYPICAL AIRCRAFT & DESIGN CATEGORIES

Aircraft	Aircraft Approach Category	Airplane Design Group	Maximum Gross Takeoff Weight (lbs)
Grumman American Tiger	A	I	2,400
Cessna 182	A	I	3,110
Cirrus Design SR22	A	I	3,400
Cessna 206	A	I	3,600
Beechcraft Bonanza A36	A	I	3,650
Socata/Aerospatiale TBM 700	A	I	6,579
Cessna P337 Skymaster	B	I	4,630
Beechcraft Baron 58	B	I	5,500
Cessna 340	B	I	5,990
Piper Aerostar 602P	B	I	6,000
Cessna Citation CJ1	B	I	10,600
Beech King Air B100	B	I	11,800
Cessna Citation I	B	I	11,850
Beechcraft 400A/Mitsubihi Diamond II	B	I	16,100
Piper Malibu (PA-46)	A	II	4,340
Cessna Caravan 1	A	II	8,000
Pilatus PC-12	A	II	9,920
Cessna Citation CJ2	B	II	12,300
Cessna Citation II	B	II	13,300
Beech King Air 350	B	II	15,000
Cessna Citation Bravo	B	II	15,000
Cessna Citation Excel	B	II	20,000
Dassault Falcon 20	B	II	28,650
Bombardier Learjet 31A	C	I	17,000
Bombardier Learjet 55	C	I	21,500
Learjet 60	C	I	23,100
Hawker (HS125-700A)	C	I	25,000
Gulfstream 100	C	II	24,650
Beechcraft Hawker 800XP	C	II	28,000
Cessna Citation Sovereign	C	II	30,250
Gulfstream 200	C	II	34,450
Cessna Citation X	C	II	36,100
Bombardier Challenger 300	C	II	37,500
Gulfstream III	C	II	69,700
Learjet 35A/36A	D	I	18,300
Gulfstream IV	D	II	71,780

Source: AC 150/5300-13, Change 10; aircraft manufacturer data.

The combination of airplane design group and aircraft approach speed creates the Airport Reference Code (ARC), which is used to define applicable airfield design standards. At airports with more than one runway, a separate ARC is often defined based on the particular use or capabilities of each runway.

Aircraft with a maximum gross takeoff weight greater than 12,500 pounds are classified as "large aircraft" by the FAA; aircraft 12,500 pounds and less are classified as "small aircraft." For purposes of airspace planning, runways designed to accommodate small aircraft exclusively are designated "utility" and runways that accommodate large aircraft are designated "other-than-utility."

Design Aircraft

As noted early, by FAA definition, the design aircraft must have a minimum of 500 itinerant annual operations. The 1995 Airport Layout Plan listed the Swearingen Metroliner as the "existing" design aircraft for Runway 10/28, which corresponded to airport reference code (ARC) B-I (small). Although apparently influenced by the expectation of scheduled passenger service by 19-seat aircraft that has not occurred, the selection of the Metroliner as design aircraft is not highly significant since the B-I (small) category also includes the majority of light twin piston-engine aircraft within the general aviation fleet. The "existing" ARC for Runway 3/21 (now 4/22) listed on the 1995 ALP was consistent with use by small single-engine aircraft [A-I (small)].

The 1995 ALP identified the "future" critical aircraft as a Fokker 27 (F27), twin-engine turboprop, which is included in ARC B-III. The F27 has a MGTW ranging from 40,500 to 45,000 pounds, with a common wingspan of 95'-2". A note on the 1995 ALP indicates that although the F27 was identified as the future design aircraft, protecting for ARC C-III was recommended (typ. Boeing 727-100) based on existing airfield clearances and the prospect of future B727 activity. According to the 1995 Airport Master Plan forecasts, these planning assumptions were based on the expectation that air cargo activity would expand to include approximately 2 flights per day of F27 or DC-3 aircraft and that development of large aircraft repair facilities at BVS could generate up to 504 annual B727 type operations by 2004. To some degree, the ability of the existing airside facilities to accommodate large aircraft activity appears to have contributed to the heightened expectations of activity. While the prospect of this type of activity cannot be entirely discounted, it appears that such activity would be unlikely based on current trends within the aviation industry. The "future" ARC for Runway 3/21 listed on the 1995 ALP was B-I (small), consistent with use by small single- and twin-engine aircraft.

As noted in the updated aviation forecasts (Chapter 2), the existing design aircraft operating at BVS (on Runway 10/28) is included in Airplane Design Group II (ADG II) and Approach Categories A or B. This activity includes daily commercial passenger and cargo service provided by Cessna Caravan turboprops; itinerant business jet and turboprop activity; and several locally based turbine aircraft. BVS also accommodates locally based and transient activity from Approach Category C and D aircraft (within Airplane Design Groups I and II), although current levels are estimated to be less than 500 annual operations. The updated 20-year master plan forecasts anticipate that Approach Category C&D operations at BVS will continue to increase during the currently planning period, and will meet the FAA activity criteria for use of D-II aircraft as the future design aircraft near the midpoint of the 20-year planning period.

At a length of 3,000 feet, Runway 4/22 is used predominately by small single-engine and light twin-engine aircraft included in ADG I. Considering its role as a secondary runway, it is appropriate to continue planning Runway 4/22 based on ADG I (small aircraft exclusively) design standards for Approach Category A and B aircraft.

The use of standards consistent with "large aircraft" and "other-than-utility" runways, as defined in FAR Part 77, is appropriate for Runway 10/28. Runway 4/22 should be planned as a "utility" runway designed for aircraft weighing 12,500 pounds or less. Based on the airfield configuration, air traffic, and forecast airport activity, the following **Airport Reference Codes (ARC)** are recommended for BVS:

Runway 10/28

Current ARC: B-II *(Aircraft Approach Category B and Airplane Design Group II)*

Future ARC: D-II *(Aircraft Approach Category D and Airplane Design Group II)*

Runway 4/22

Current and Future ARC: B-I (small) *(Aircraft Approach Category B and Airplane Design Group I: aircraft weighing 12,500 pounds and less)*

Recommended airfield design standards and existing conditions for Runways 10/28 and 4/22 are summarized in **Table 3-3** and **Table 3-4.** A summary of current conformance with FAA-recommended design standards at BVS is presented in **Table 3-5**.

TABLE 3-3: AIRPORT DESIGN STANDARDS SUMMARY (DIMENSIONS IN FEET)

FAA Standard	Runway 10/28 *Existing Conditions*[1] *(as depicted on 1995 ALP and Airspace Plan Drawings or currently published)*	ADG II[6] A&B Aircraft	ADG II[7] C&D Aircraft
Runway Length	5,477	3,490/5,260 [8]	5,260/6,650 [9]
Runway Width	100	75[14]	100
Runway Shoulder Width	10	10	10
Runway Safety Area Width	120 [1]	150	500
Runway Safety Area Length (Beyond Rwy End)	240 [1]	300	1,000
Obstacle-Free Zone Width	250 [1]	400	400
Object Free Area Width	250 [1]	500	800
Object Free Area Length (Beyond Rwy End)	240 [1]	300	1,000
Primary Surface Width	500 [2]	500	1,000
Primary Surface Length (Beyond Rwy End)	200 [2]	200	200
Runway Protection Zone Length	1,000 [1]	1,000	2,500
Runway Protection Zone Inner Width	250 [1]	500	1,000
Runway Protection Zone Outer Width	450 [1]	700	1,750
Runway Centerline to: Parallel Taxiway/Taxilane Centerline Aircraft Parking Area Building Restriction Line	 500 Apprx. 555' [3] 750	 240 250/320 [10] 460 [12]	 400 [15] 500/570 [11] 710 [13]
Taxiway Width	50	35	35
Taxiway Shoulder Width	10	10	10
Taxiway Safety Area Width	Varies [4]	79	79
Taxiway Object Free Area Width	89 [3]	131	131
Taxiway Centerline to Fixed/Movable Object	Apprx. 55 [3]	65.5	65.5
Taxilane Object Free Area Width	79 [5]	115	115
Taxilane Centerline to Fixed/Movable Object	39.5 [5]	39.5	39.5

Notes:

1. "Existing" dimensions as depicted on 1995 ALP based on B-I (small) ARC; "future" dimensions based on C-III ARC not yet implemented. Current clearances vary, but generally exceed ADG I and II standards for Category A and B aircraft.
2. Dimensions based on existing NPI approach capabilities for Runway 10/28 (Per FAR Part 77.25)
3. Three light aircraft tiedown positions are located on Tiedown Apron "D" are within 55 feet of Taxiway A centerline (within ADG II taxiway OFA).
4. Main taxiways are 50 feet wide, which exceeds the ADG I taxiway safety area standards; clear areas beyond taxiway pavements generally meet or exceed ADG II dimensional standards. Soft ground surface beyond pavement may require compaction or modification to meet FAA design standard for accommodating the weight of an aircraft.

5. Typical taxilane clearances for tiedown aprons and adjacent hangar developments; some actual taxilane OFA clearances vary within the West hangar complex.
6. Based on Other-than-Utility nonprecision instrument runway (Per FAR Part 77) with not lower than ¾ mile approach visibility minimums. RPZ dimensions based on approach visibility minimums visual and not lower than 1-mile for Aircraft Approach Category A & B aircraft (Per AC 150/5300-13, Change 10).
7. Based on Other-than-Utility nonprecision instrument runways (Per FAR Part 77) with lower than 3/4-statute mile approach visibility minimums. RPZ dimensions based on lower than 3/4-mile approach visibility minimums with Aircraft Approach Category C & D aircraft (Per AC 150/5300-13, Change 10).
8. Runway lengths required to accommodate: 100 percent of Small Airplanes (12,500 pounds or less) & 75 percent of large airplanes (60,000 pounds or less) at 60 percent useful load. 75.1 degrees F, 46-foot change in runway centerline elevation.
9. Runway lengths required to accommodate 75 percent large airplane fleet (60,000 pounds or less) at 60 and 90 percent useful load. 75.1 degrees F, 46-foot change in runway centerline elevation.
10. FAA minimum dimensions and actual distances required to accommodate 10-foot aircraft tail height (at the APL) without penetrating the 7:1 Transitional Surface for nonprecision instrument approach and to remain clear of standard taxiway OFA.
11. FAA minimum dimensions and actual distances required to accommodate 10-foot aircraft tail height (at the APL) without penetrating the 7:1 Transitional Surface for precision instrument approach and to remain clear of standard taxiway OFA.
12. Distance required to accommodate a 30-foot structure (at the BRL) without penetrating the 7:1 Transitional Surface for nonprecision instrument approach.
13. Distance required to accommodate a 30-foot structure (at the BRL) without penetrating the 7:1 Transitional Surface for precision instrument approach.
14. The recommended Approach Category A&B ADG II runway width increases to 100 feet for lower than ¾-statute mile visibility minimums.
15. Recommended parallel taxiway separation based on C&D runways with lower than ¾-mile visibility minimums, typical of a Category I precision approach with runway approach lighting system.

TABLE 3-4: AIRPORT DESIGN STANDARDS SUMMARY (DIMENSIONS IN FEET)

FAA Standard	Runway 4/22 *Existing Conditions*[1] *(as depicted on 1995 ALP and Airspace Plan Drawings or currently published)*	ADG I[5] *A&B Aircraft (small aircraft exclusively)*	ADG I[6] A&B Aircraft
Runway Length	3,000	2,940/3,490[7]	2,940/3,490[7]
Runway Width	60	60	100
Runway Shoulder Width	10	10	10
Runway Safety Area Width	120	120	500
Runway Safety Area Length (Beyond Rwy End)	240	240	1,000
Obstacle-Free Zone Width	250	250	400
Object Free Area Width	250	250	800
Object Free Area Length (Beyond Rwy End)	240	240	1,000
Primary Surface Width	250	250	1,000
Primary Surface Length (Beyond Rwy End)	200	200	200
Runway Protection Zone Length	1,000	1,000	2,500
Runway Protection Zone Inner Width	250	250	1,000
Runway Protection Zone Outer Width	450	450	1,750
Runway Centerline to: Parallel Taxiway/Taxilane Centerline Aircraft Parking Area Building Restriction Line	 150 260 [2] 260	 150 125/194.5 [8] 260 [9]	 225 200/269.5 [8] 260 [9]
Taxiway Width	35	25	25
Taxiway Shoulder Width	10	10	10
Taxiway Safety Area Width	Varies [3]	49	49
Taxiway Object Free Area Width	89	89	89
Taxiway Centerline to Fixed/Movable Object	110 [4]	44.5	44.5
Taxilane Object Free Area Width	79	79	79
Taxilane Centerline to Fixed/Movable Object	39.5	39.5	39.5

Notes:

1. "Existing" dimensions as depicted on 1995 ALP based on A-I (small) ARC and visual approaches.
2. The edges of the light aircraft tiedown apron and cargo apron are located approximately 260 feet from runway centerline.
3. Taxiway G is 35 feet wide, which exceeds the ADG I taxiway width standard; clear areas beyond taxiway edges generally meet or exceed ADG I OFA dimensional standards. Soft ground surface beyond pavement may require compaction or modification to meet FAA design standard for accommodating the weight of an aircraft.
4. The edges of the light aircraft tiedown apron, cargo apron and hangars are located approximately 110 feet from the centerline of Taxiway G.

5. Based on Utility visual runway (Per FAR Part 77) with not lower than 1 mile approach visibility minimums. RPZ dimensions based on approach visibility minimums not lower than 1-mile for Aircraft Approach Category A & B aircraft (Per AC 150/5300-13, Change 10).
6. Based on Utility visual runway (Per FAR Part 77) with not lower than 1 mile approach visibility minimums. RPZ dimensions based on visual and not lower than 1-mile approach visibility minimums for runways used by Small Aircraft Exclusively (Per AC 150/5300-13, Change 10).
7. Runway lengths required to accommodate: 95 and 100 percent of Small Airplanes (12,500 pounds or less). 75.1 degrees F, 13-foot change in runway centerline elevation.
8. FAA minimum dimensions and actual distances required to accommodate 10-foot aircraft tail height (at the APL) without penetrating the 7:1 Transitional Surface for visual approach and to remain clear of ADG I standard taxiway OFA.
9. Distance required to accommodate a 19-foot structure (at the BRL) without penetrating the 7:1 Transitional Surface for visual approach.

TABLE 3-5: BVS CONFORMANCE WITH FAA DESIGN STANDARDS

Item	***Runway 10/28*** *Airplane Design Group II A&B Aircraft*	***Runway 10/28*** *Airplane Design Group II C & D Aircraft*	***Runway 4/22*** *Airplane Design Group I Small Aircraft*
Runway Safety Area	Yes	Yes[1]	Yes
Runway Object Free Area	Yes	Yes[1]	Yes
Runway Obstacle Free Zone	Yes	Yes	Yes
Taxiway Safety Area	Yes	Yes	Yes
Taxiway Object Free Area	No[2]	No[2]	Yes
Building Restriction Lines	Yes	Yes	Yes
Aircraft Parking Lines	No[2]	No[2]	Yes
Runway Protection Zones	No[3]	No[3]	Yes
Runway-Parallel Taxiway Separation	Yes[4]	Yes[4]	Yes
Runway Width	Yes[5]	Yes	Yes
Runway Length	Yes[6]	No[7]	Yes
Taxiway Width	Yes[8]	Yes[8]	Yes[9]
Runway Visibility Zone	Yes	Yes	Yes

Notes:

1. Adequate clear areas exist to meet dimensional standards; relocation of minor fences and grading may be required to meet FAA design standards.
2. Three aircraft tiedowns located on Tiedown Apron "D" are within Taxiway A OFA (within 65.5 feet of taxiway centerline)
3. Higgins-Airport Way is located within Runway 28 RPZ
4. Existing runway-parallel taxiway separation (500 feet) exceeds ADG II standards for both Approach Category A & B and C& D aircraft for runways with lower than ¾-statute mile visibility minimums.
5. Runway 10/28 width (100') exceeds FAA minimum width standards (75 feet) for ADG II A&B Aircraft
6. Per FAA Runway Length Model: Existing runway length exceeds FAA-recommended minimum length required to accommodate 75% of large aircraft weighing less than 60,000# at 60% useful load.
7. Per FAA Runway Length Model: Existing runway length is less than FAA-recommended minimum length required to accommodate 75% of large aircraft weighing less than 60,000# at 90% useful load.
8. Taxiway A is 50 feet wide; exceeds minimum width (35 feet) standards for ADG II aircraft.
9. Taxiway G is 35 feet wide; exceeds minimum width (25 feet) standards for ADG I aircraft.
10. The runway-parallel taxiway centerline separation meets ADG I (small) standards only. However, the primary elements of the parallel taxiway design and intended use reflect ADG II standards. The existing runway-parallel taxiway separation is 90 feet less than ADG II standards.

Airport Planning & Design Standards Note:

The following existing and future standards are recommended for BVS:

***Runway 10/28 (Existing)** - Airport Design Standards based on Airport Reference Code (ARC) B-II; visual runways and runways with not lower than ¾-statute mile approach visibility minimums. Runway protection zones (RPZ) based on the approach visibility standard "visual and not lower than 1-mile" for aircraft approach categories A and B. FAR Part 77 airspace planning criteria based on "other-than-utility runways" with nonprecision instrument approaches; visibility minimums greater than ¾ statute mile.*

***Runway 10/28 (Future)** - Airport Design Standards based on ARC D-II. RPZs based on the approach visibility standard "lower than 3/4-mile" for all aircraft. FAR Part 77 airspace planning criteria based on "other-than-utility runways" with precision instrument approaches.*

***Runway 4/22 (Existing and Future)** - Airport Design Standards based on ARC B-I (small aircraft exclusively); visual runways and runways with not lower than ¾ statute mile approach visibility minimums. RPZs based on the approach visibility standard "visual and not lower than 1-mile" for small aircraft exclusively. FAR Part 77 airspace planning criteria based on "utility runways" with visual approaches (ultimate).*

All references to the "standards" are based on these assumptions, unless otherwise noted. (Per FAA Advisory Circular 150/5300-13, change 9; FAR Part 77.25)

Runway Safety Area (RSA)

The FAA defines runway safety area (RSA) as "A defined surface surrounding the runway prepared or suitable for reducing the risk of damage to airplanes in the event of an undershoot, overshoot, or excursion from the runway." Runway safety areas are most commonly used by aircraft that inadvertently leave (or miss) the runway environment during landing or takeoff.

By FAA design standard, the RSA *"shall be:*

(1) cleared and graded and have no potentially hazardous ruts, humps, depressions, or other surface variations;

(2) drained by grading or storm sewers to prevent water accumulation;

(3) capable, under dry conditions, of supporting snow removal equipment, aircraft rescue and firefighting equipment, and the occasional passage of aircraft without causing structural damage to the aircraft; and

(4) free of objects, except for objects that need to be located in the runway safety area because of their function. Objects higher than 3 inches above grade should be constructed on low impact resistant supports (frangible mounted structures) of the lowest practical height with the frangible point no higher than 3 inches. Other objects such as manholes, should be constructed at grade. In no case should their height exceed 3 inches."

The recommended transverse grade for the lateral RSA ranges between 1½ and 5 percent from runway shoulder edges. The recommended longitudinal grade for the first 200 feet of extended RSA beyond the runway end is 0 to 3 percent. The remainder of the RSA must remain below the runway approach surface slope. The maximum negative grade is 5 percent. Limits on longitudinal grade changes are plus or minus 2 percent per 100 feet within the RSA.

The airport sponsor should regularly clear the RSA of brush or other debris and periodically grade and compact the RSA to maintain FAA standards.

It is recognized that the FAA standard for accommodating aircraft and airport vehicles in the RSA is based on "dry conditions." However, based on a high water table and saturated soils common to the site, consideration should be given to the relative infrequency of "dry conditions," which may justify additional surface preparation to improve conditions for typical "wet" conditions. This might involve use of gravel fill to improve drainage and compaction within the RSA, particularly along the sides of the runway. However, the most effective method suitable for the site would be determined during design.

Runway 10/28

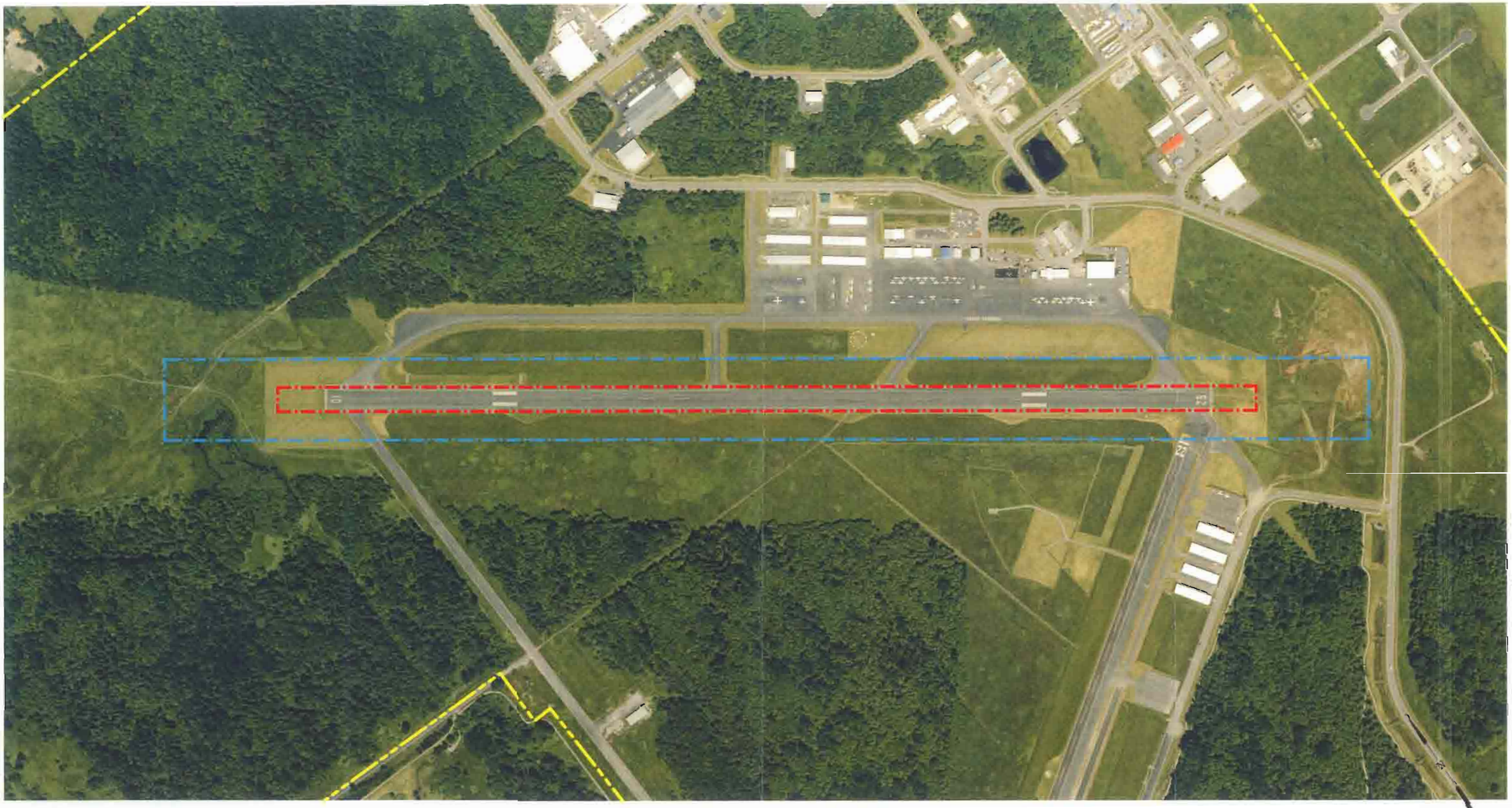
The standard B-II RSA is 150 feet wide and extends 300 feet beyond each runway end. The clear areas surrounding Runway 10/28 extend well beyond the B-II dimensional standard. However, it is not immediately evident that the RSA has been improved to meet FAA gradient and surface condition standards. Some grading and/or compaction may be required based on FAA design standards; a survey of existing gradients and engineering evaluations would be used to determine the specific requirements of the site. The RSA appears to be free of physical obstructions (excluding navigational aids, lighting, airfield signs, etc.). Runway edge and threshold lights, information/directional signs, REIL and VASI located within the RSA are mounted on frangible supports. Any future lighting (such as new PAPI units) located within the RSA will also need to meet the FAA frangibility standard.

The future D-II RSA is 500 feet wide and extends 1,000 feet beyond each runway end. The clear areas surrounding Runway 10/28 are capable of accommodating the larger D-II RSA without any relocation of roads or structures. Some existing fencing will need to be removed or relocated and it appears that the extended RSA would require some fill and grading to meet the FAA gradient

standards. Some grading along the sides of the runway may also be needed to maintain consistent surface elevations (to be determined through updated survey). The existing and future FAA-recommended RSA for Runway 10/28 is depicted in **Figure 3-1**.

Runway 4/22

The standard B-I (small) RSA is 120 feet wide and extends 240 feet beyond each runway end. The clear areas surrounding Runway 4/22 extend well beyond the required dimensional standard. At the Runway 22 end, a portion of the RSA consists of older pavement located adjacent to the end of Runway 28. At the Runway 4 end, there is approximately 2,000 feet of original runway pavement (150 feet wide) extending beyond the runway end. When the runway was narrowed from 150 to 60 feet, the north edge of the runway was maintained and approximately 90 feet of pavement on the south side of the runway was abandoned but remains in reasonably good condition. As a result, the lateral RSA on the south side of Runway 4/22 is hard surfaced and the north side is grass. The RSA is free of physical obstructions and appears to be within grade standard. As with Runway 10/28, the grass surfaced areas of the RSA are relatively soft and may require some improvement to meet FAA standards for accommodating aircraft without causing structural damage. Engineering evaluations will be used to determine any specific improvements in soil compaction or grading within the RSA for Runway 4/22. The existing and future FAA-recommended RSA for Runway 4/22 is depicted in **Figure 3-2**.



LEGEND

- B-II RUNWAY SAFETY AREA (6077' X 150')
- C/D-II RUNWAY SAFETY AREA (7477' X 500')
- PROPERTY BOUNDARY

SOURCE: WALKER AND ASSOCIATES (6-17-04)

300 0 300

PORT OF SKAGIT COUNTY

CENTURY WEST ENGINEERING CORPORATION

DAVID EVANS AND ASSOCIATES INC

RUNWAY 10/28 - RUNWAY SAFETY AREA

SKAGIT REGIONAL AIRPORT
AIRPORT MASTER PLAN

FIGURE 3-1

LEGEND

- B-I (SMALL) RUNWAY SAFETY AREA (3480' X 120')
- B-I (SMALL) OBJECT FREE AREA (3480' X 250')
- PROPERTY BOUNDARY

SOURCE: WALKER AND ASSOCIATES (6-17-04)

200 0 200
SCALE: 1"=200'

PORT OF SKAGIT COUNTY

CENTURY WEST ENGINEERING CORPORATION

DAVID EVANS ASSOCIATES, INC.

RUNWAY 4/22 - RUNWAY SAFETY AREA & OBJECT FREE AREA

SKAGIT REGIONAL AIRPORT
AIRPORT MASTER PLAN

FIGURE
3-2

Runway Object Free Area (OFA)

Runway object free areas (OFA) are two-dimensional surfaces intended to be clear of ground objects that protrude above the runway safety area edge elevation. Obstructions within the OFA may interfere with aircraft flight in the immediate vicinity of the runway. The FAA defines the OFA clearing standard:

"The OFA clearing standard requires clearing the OFA of above ground objects protruding above the runway safety area edge elevation. Except where precluded by other clearing standards, it is acceptable to place objects that need to be located in the OFA for air navigation or aircraft ground maneuvering purposes and to taxi and hold aircraft in the OFA. Objects non-essential for air navigation or aircraft ground maneuvering purposes are not to be placed in the OFA. This includes parked airplanes and agricultural operations."

The airport sponsor should periodically inspect the OFA and remove any objects that protrude into the OFA.

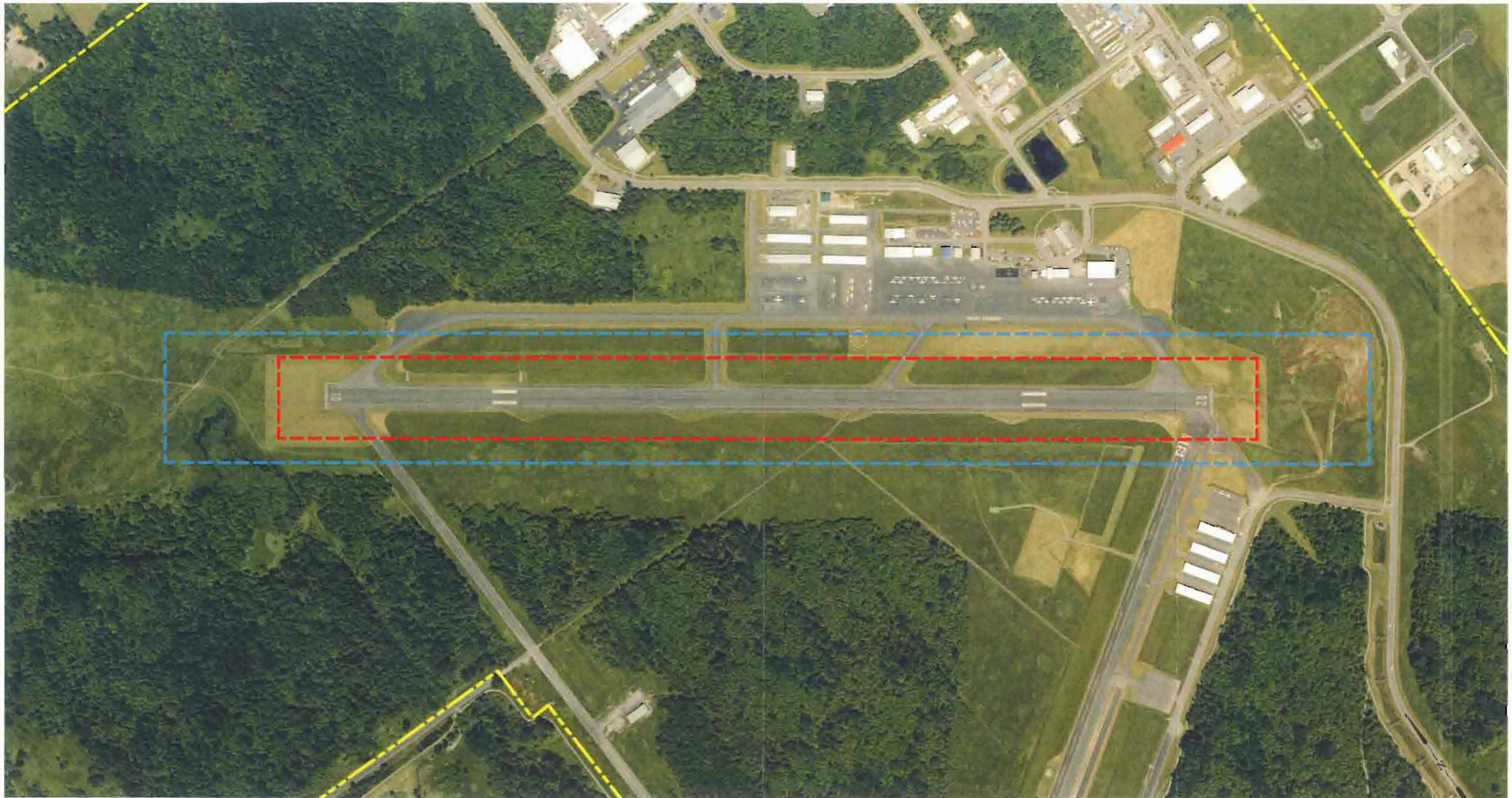
Runway 10/28

The standard B-II OFA is 500 feet wide and extends 300 feet beyond each runway end. The clear areas surrounding Runway 10/28 extend well beyond the B-II OFA dimensional standard. The OFA appears to be free of physical obstructions (excluding navigational aids, lighting, airfield signs, etc.).

The future D-II OFA standard dimension is 800 feet wide and extends 1,000 feet beyond each runway end. As with the RSA, the clear areas surrounding Runway 10/28 are capable of accommodating the larger D-II OFA without any relocation of roads or structures. Some existing fencing will need to be removed or relocated to meet the FAA clearance standards. The existing and future FAA-recommended OFA for Runway 10/28 is depicted in **Figure 3-3**.

Runway 4/22

The standard B-I (small) OFA is 250 feet wide and extends 240 feet beyond each runway end. The clear areas surrounding Runway 4/22 extend well beyond the required dimensional standard.



LEGEND

- B-II OBJECT FREE AREA (6077' X 500')
- C/D-II OBJECT FREE AREA (7477' X 800')
- PROPERTY BOUNDARY

SOURCE: WALKER AND ASSOCIATES (6-17-04)

300 0 300
SCALE: 1"=300'

PORT OF SKAGIT COUNTY

CENTURY WEST ENGINEERING CORPORATION

DAVID EVANS AND ASSOCIATES INC

RUNWAY 10/28 - OBJECT FREE AREA

SKAGIT REGIONAL AIRPORT
AIRPORT MASTER PLAN

FIGURE 3-3

Obstacle Free Zone (OFZ)

The OFZ are planes of clear airspace extending upward above runway elevation that are intended to protect close-in obstructions that may create hazards for aircraft. The FAA defines the following clearing standard for the OFZ:

"The OFZ clearing standard precludes taxiing and parked airplanes and object penetrations, except for frangible visual NAVAIDs that need to located in the OFZ because of their function."

Based on the planned upgrade to precision instrument approach capabilities on Runway 10/28, the required OFZ includes the Runway OFZ; the Inner-approach OFZ (for runways with approach lighting systems); the Inner-transitional OFZ (for runways with lower than ¾-statute mile approach visibility minimums); and the Precision OFZ. For Runway 4/22, only the Runway OFZ is required based on its configuration and visual approach capabilities.

The FAA defines the Runway OFZ as:

"The runway OFZ is a defined volume of airspace centered above the runway centerline. The runway OFZ is the airspace above a surface whose elevation at any point is the same as the elevation of the nearest point on the runway centerline. The runway OFZ extends 200 feet beyond each end of the runway."

The FAA-recommended Runway OFZ width for Runway 10/28 is 400 feet, based on its ability to serve large airplanes; the OFZ standard width for Runway 4/22 is 250 feet, based on its use by small aircraft.

The FAA defines the Inner-approach OFZ as:

"The inner-approach OFZ is a defined volume of airspace centered on the approach area. It applies only to runways with an approach lighting system. The inner-approach OFZ begins 200 feet from the runway threshold at the same elevation as the runway threshold and extends 200 feet beyond the last light unit in the approach lighting system. Its width is the same as the runway OFZ and rises at a slope of 50 (horizontal) to 1 (vertical) from its beginning."

The Inner-approach OFZ for Runway 28 is overlapped by the runway's planned 50:1 approach surfaces, which are wider and extend beyond the Inner-approach OFZ. Vehicles traveling on Higgins-Airport Way will cross under the inner-approach OFZ, although it appears that based on the distance from the runway end and the elevation of the roadway, they will remain below the 50:1 Inner-approach OFZ and runway approach surface.

The FAA defines the Inner-transitional OFZ as:

"The inner-transitional OFZ is a defined volume of airspace along the sides of the runway OFZ and the inner-approach OFZ. It applies only to runways with lower than ¾-statute mile approach visibility minimums.

(2) For runways serving large airplanes, separate inner-transitional OFZ criteria apply for Category (CAT) I and CAT II/III runways.

(a) For CAT I runways, the inner transitional OFZ begins at the edges of the runway OFZ and inner-approach OFZ, then rises vertically for a height "H", and then slopes 6 (horizontal) to 1 (vertical) out to a height of 150 feet above the established airport elevation." [32]

Based on the substantial lateral separations already in place for Runway 10/28, it appears that Inner-transitional OFZ will be clear of structures and parked aircraft. The potential impact of heavily forested areas along the sides of Runway 10/28 (as surveyed in 1999 Airport Obstruction Chart) will be reviewed as part of the update of the airspace plan. Penetrations to any of the defined OFZ areas could affect the minimums established for any new precision instrument approaches.

The FAA defines the Precision OFZ as:

"The Precision OFZ is defined as a volume of airspace above an area beginning at the runway threshold, at the threshold elevation, and centered on the extended runway centerline, 200 feet long by 800 feet wide."

"The surface is in effect only when all of the following operational conditions are met:

(1) Vertically guided approach

(2) Reported ceiling below 250 feet and/or visibility less than 3/4 –statute mile (or RVR below 4,000 feet) [33]

(3) An aircraft on final approach within two (2) miles of the runway threshold.

[32] (1) In U.S. customary units, $H_{feet} = 61 - 0.094\ (S_{feet}) - 0.003\ (E_{feet})$. S is equal to the most demanding wingspan of the airplanes using the runway and E is equal to the runway threshold elevation above sea level.
[33] RVR: Runway Visual Range. A measurement (in feet) of visibility along the runway with transmissometer installed on the side of a runway.

When the POFZ is in effect, the wing of an aircraft holding on a taxiway waiting for runway clearance may penetrate the POFZ; however, neither the fuselage nor the tail may infringe on the POFZ."

The existing aircraft holding areas on Taxiway A are entirely clear of a future POFZ that may be required at the end of Runway 10 or 28.

Runway 10/28

It appears that there are no penetrations to the Runway 10/28 OFZ, other than the runway lights, VASI, REIL, directional signage, distance remaining signs, etc., which have locations fixed by function. All items located within the OFZ must meet the FAA frangibility standard. Aircraft hold lines should be located at least 250 feet from runway centerline on each of the exit taxiways connecting to the runway, which keeps holding aircraft entirely outside the runway OFZ and below the inner-transitional OFZ.

Runway 4/22

It appears that there are no penetrations to the Runway 4/22 OFZ, other than the runway lights, PAPI, directional signage, etc., which have locations fixed by function. The aircraft hold lines on the connecting taxiways for Taxiway G are located 125 feet from runway centerline, which correspond to the edge of the OFZ.

Taxiway Safety Area

The 1995 ALP depicted a 118-foot wide safety area for Taxiway A, based on the future ADG III design standards. The recommended safety area dimensions for the main access taxiways on the airport are based on ADG II design standards (79 feet). The parallel taxiway (Taxiway A) for Runway 10/28 and Taxiway F, which extends from the end of Runway 10 to the 4/22 flightline, are both 50 feet wide. To meet the ADG II standard, a 14.5-foot wide prepared safety area is required along each edge of the 50-foot wide taxiways. Taxiway G, which serves the Runway 4/22 flightline, is 35 feet wide. To meet the ADG II standard, a 22-foot wide prepared safety area is required along each edge of the taxiway.

It appears that all of the major access taxiway safety areas meet the ADG II clearance standard. However, as with runway safety areas on the airport, the soft ground surface located immediately adjacent to the taxiways may require some improvement to adequately support the weight of an

aircraft. Engineering evaluations will be used to determine any specific improvements in soil compaction or grading within taxiway safety areas.

Taxiway safety areas should be regularly cleared of brush or other debris and periodically graded and compacted to maintain FAA standards.

Taxiway/Taxilane Object Free Area

The 1995 ALP depicts an ultimate taxiway OFA of 186 feet for Taxiway A, which was based on previously-recommended ADG III standards. The ALP depicts a taxiway OFA of 89 feet for Taxiway G, which is consistent with ADG I standards. However, other components of the Taxiway G design reflect ADG II standards.

Based on current and forecast activity, the recommended ADG II OFA width dimension for all major access taxiways is 131 feet. All facilities and parked aircraft located along the taxiways should have a minimum setback of 65.5 feet, which corresponds to the outer edge of the ADG II taxiway OFA. It appears that most taxilane connections to Taxiway A along the 10/28 flightline do not have aircraft hold lines marked on the pavement to denote the edge of the taxiway OFA. Aircraft hold lines should be marked on all taxilanes or taxiways that connect to the main taxiways to protect the taxiway OFA (minimum of 65.5 feet from taxiway centerline). Three light aircraft tiedown positions located at Tiedown Apron D, opposite the segmented circle, were verified as being within the ADG II taxiway OFA and should be removed. No other penetrations to the main taxiway OFAs were identified.

Most taxilanes located on aircraft parking aprons or within the hangar areas meet the ADG I taxilane OFA clearance standard. However, two related items were noted in the site inventory conducted as part of the master plan update.

Several large overhead flood light poles are located near the north side corners of T-hangars "E" and "C," approximately 36 to 37 feet from the taxilane centerline, which appear to be within the ADG I taxilane OFA (extends 39.5 feet each side of centerline). The poles are not frangible. Relocating the poles outside the taxilane OFA may not be possible due to configurations of building and adjacent taxilanes. However, it is noted that the FAA alternative taxilane clearance OFA dimensional criteria (1.2 x wingspan of the largest aircraft, plus 20 feet) could accommodate aircraft with wingspans up to 43 feet on these taxilanes (assuming 36 feet from centerline to the nearest poles).

Another minor OFA deviation was observed along the northern edge of the taxilane located between T-hangar "D" and the Methow Aviation hangar. Along the northern edge of the taxilane, areas of pushed up terrain and old pavement were noted about a foot higher than the adjacent taxilane, within the OFA. It appears that an old chain-link fence was once located in this area (now removed); several fence posts have been cut off flush to the ground, which is higher than the adjacent taxilane.

It is recommended that reflective tape be added to the light poles to provide additional recognition for pilots taxiing between the hangars and that the elevated terrain noted within taxiway OFA should be leveled and graded.

Building Restriction Line (BRL)

The 1995 ALP depicts 750-foot building restriction lines (BRL) on both sides of Runway 10/28. A 264-foot BRL is depicted on both sides of Runway 4/22. The BRLs do not extend into the infield area near the ends of Runway 22 and 28, which is within the runway visibility zone (RVZ) and requires a clear visual line of sight. There are no buildings located within the BRLs depicted for either runway.

The 750-foot BRLs for Runway 10/28 can accommodate structures up to 35.7 feet above runway elevation (on the BRL) without penetrating the runway transitional surface associated with future precision instrument approaches. The nearest buildings to the runway are located approximately 750 feet from centerline, extending along the BRL, from the airport terminal building to the Corporate Air Center hangar. The nearest buildings located along the western end of the 10/28 flightline (T-hangars) are approximately 840 feet from runway centerline.

The 264-foot BRLs for Runway 4/22 can accommodate structures up to 19.8 feet above runway elevation (on the BRL) without penetrating the visual runway transitional surface for utility runways used by small aircraft. The BRL also provides adequate clearance for the Taxiway OFA based on ADG II standards.

Runway Protection Zones (RPZ)

The FAA provides the following definition for runway protection zones (RPZ):

"The RPZ's function is to enhance the protection of people and property on the ground. This is achieved through airport owner control over RPZs. Such control includes clearing RPZ areas

(and maintaining them clear) of incompatible objects and activities. Control is preferably exercised through the acquisition of property interest in the RPZ. The RPZ is trapezoidal in shape and centered about the extended runway centerline. The RPZ begins 200 feet beyond the end of the area useable for takeoff or landing."

RPZs with buildings, roadways, or other items do not fully comply with FAA standards. The 1995 ALP depicts Higgins-Airport Way crossing through both the "existing" visual RPZ and the "future" precision RPZ for Runway 28. It is recognized that realigning major surface roads located within the RPZs may not always be feasible. However, the Port should discourage development within the RPZ (particularly structures or new roads) that is inconsistent with FAA standards.

Runway 10/28

The recommended "existing" RPZ dimensions for Runways 10 and 28 are based on current capabilities and design aircraft use (Approach Categories A & B with approach visibility minimums "visual and not lower than 1-mile"). This standard is consistent with the existing non-precision instrument approaches to both runway ends. The "future" RPZ dimensions recommended for Runways 10 and 28 are based on Aircraft Approach Categories C & D with approach visibility minimums "lower than 3/4-mile." This standard is consistent with planned upgrades to precision instrument approach capabilities.

The existing RPZ for Runway 28 is located entirely within airport property; as noted above, Higgins-Airport Way crosses through the outer 100 feet of the 1,000-foot long RPZ. Recently, two parcels (4.98 acres and 17.74 acres) within the future Runway 28 RPZ were acquired by the Port to bring the RPZ fully into Port ownership. The existing and future Runway 10 RPZs are located entirely on the airport.

Runway 4/22

The recommended RPZ dimensions for Runways 4 and 22 are based on use by small aircraft exclusively with approach visibility minimums "visual and not lower than 1-mile." The RPZs for both runway ends are located entirely within airport property and meet all FAA clearance criteria.

Aircraft Parking Line (APL)

The 1995 ALP does not depict aircraft parking lines for either the existing 10/28 flightline or the future 4/22 flightline. However, most aircraft parking positions are located beyond the edge of the object free area for each parallel taxiway. Parked aircraft should not be located within 65.5 feet of

the parallel taxiway centerlines in order to maintain an unobstructed ADG II taxiway OFA; as noted earlier, three light aircraft tiedowns in Tiedown Apron "D" identified within the OFA for Taxiway A should be removed.

Runway - Parallel Taxiway Separation

Runway 10/28

Runway 10/28 has a full-length parallel taxiway (Taxiway A) with a 500-foot centerline separation, which exceeds the D-II standard (400 feet) for runways with approach visibility minimums less than ¾-statute mile. This level of approach visibility minima is consistent with a Category I precision approach with an approved approach lighting system, such as a MALS-R.

Based on the recommended precision approach upgrades for Runway 10/28, relocating the parallel taxiway to 400 feet could be considered as part of the long-term development program along the 10/28 flightline. Although FAR Part 77 clearances will limit the development that can occur within the additional 100 feet that would be gained by taxiway relocation, the relatively narrow depth of development available near the east end of the flightline will be limited by the taxiway and aircraft holding area located at the Runway 28 end. Although the aircraft holding area is currently located beyond the east end of the apron, continued eastward expansion of the apron will be affected by aircraft clearances required for taxilanes/taxiway and the aircraft holding area. This issue should be addressed in the alternatives analysis of taxiway and holding area options. **Figure 3-4** depicts the 400-foot runway-parallel taxiway separation standard for Runway 10/28.

Runway 4/22

Runway 4/22 has a full-length parallel taxiway (Taxiway G) with a 150-foot centerline separation. This separation is consistent with the B-I (small) runway-parallel taxiway separation standard (150 feet). However, other design criteria applied to Taxiway G are consistent with ADG II aircraft standards. The eastern 1,500 feet of the parallel taxiway was constructed in 1999 to the approximate mid-point of the runway; the tiedown apron and four hangar taxilanes located near the Runway 22 end were constructed as part of the same project in 1999. The new air cargo apron was constructed in 2000 near the mid-point of Runway 4/22. The western 1,500 feet of Taxiway G was constructed in 2003 to provide access to the western section of the 4/22 flightline. The projects were funded through FAA Airport Improvement Program (AIP) grants.

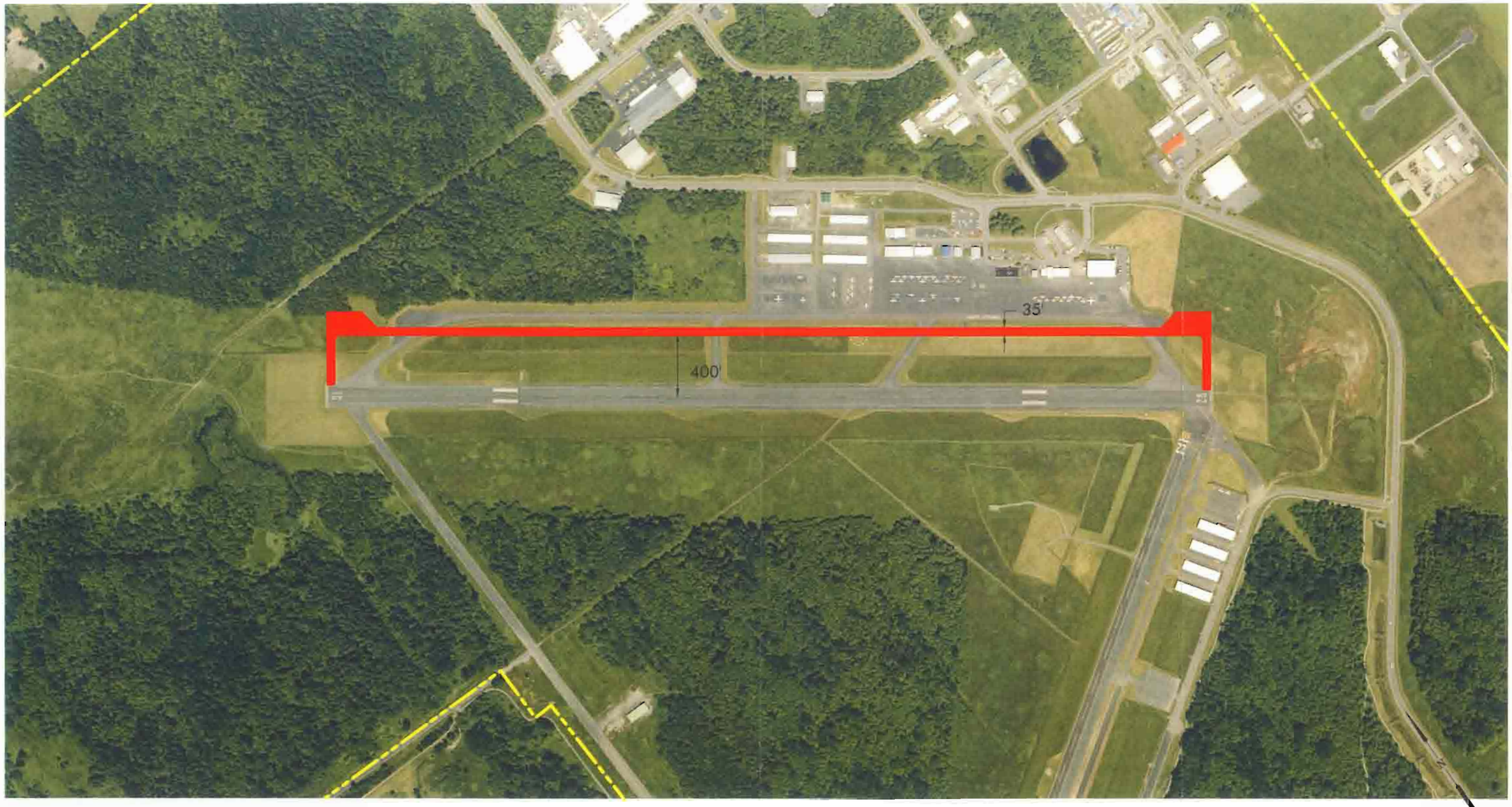
As noted earlier, recent improvements to Runway 4/22 have not been eligible for FAA funding because of the high level of wind coverage provided by the primary runway. Based on these

funding limitations, it is apparent that the primary purpose of the FAA-funded Taxiway G project was to provide access along the 4/22 flightline, including a new air cargo apron, rather than to improve the operational efficiency of Runway 4/22.

Both Taxiway G and the air cargo apron were designed to accommodate ADG II aircraft, such as the Cessna Caravan (C208B) currently operated at the airport by FedEx. However, with this project, conventional FAA runway-parallel taxiway separations standards were not observed. This issue has recently been discussed between the Port and FAA, and it appears that the earlier rationale is no longer acceptable to FAA. Based on use by ADG II aircraft, the FAA-recommended runway-parallel taxiway centerline separation is 240 feet. Alternative runway-parallel taxiway separations may also be an option if adequate aircraft wingtip clearances can be demonstrated between an ADG I aircraft on the runway and an ADG II aircraft on Taxiway G.

Note: Based on subsequent consultation between FAA and the Port, it was determined that the existing runway-taxiway configuration can be maintained with a temporary modification to standards. The Port will add an operational note to the published FAA Airport/Facility Directory (A/FD) to advise pilots to avoid simultaneous operations on Runway 4/22 when larger (ADG II) aircraft are observed on Taxiway G; a future project will relocate the runway to provide acceptable runway-parallel taxiway separation.

The FAA requested that the Runway 4/22-Taxiway G issue be evaluated in the master plan update. Based on a review of available options and the absence of FAA funding for the potential facility improvements, the Port initially proposed to address the issue through changes in aircraft operating procedures, rather than making physical changes in runway or taxiway configuration. As proposed, aircraft taxiing procedures would be modified to direct ADG II aircraft to taxi on Runway 4/22, rather than the parallel taxiway. In this situation, the runway would be unavailable for another aircraft takeoff or landing while occupied by the taxiing aircraft. Based on review of the proposal, the FAA indicated that an operational procedure alone would not be acceptable and requested that the Port seek a facility-based solution through the master plan alternatives process. Please see Chapter Four for a description of that process.



LEGEND

- C/D-II PARALLEL TAXIWAY
- PROPERTY BOUNDARY

SOURCE: WALKER AND ASSOCIATES (6-17-04)

300 0 300
SCALE: 1"=300'

PORT OF SKAGIT COUNTY

CENTURY WEST ENGINEERING CORPORATION

DAVID EVANS AND ASSOCIATES INC

RUNWAY 10/28 - PARALLEL TAXIWAY SEPARATION STANDARD

SKAGIT REGIONAL AIRPORT
AIRPORT MASTER PLAN

FIGURE
3-4

Runway Visibility Zone

The FAA requires a clear line of sight between the ends of intersecting runways defined as:

"The runway visibility zone is an area formed by imaginary lines connecting the two runways' visibility points. Terrain needs to be graded and permanent objects need to be designed or sited so that there will be an unobstructed line of sight from any point five feet above one runway centerline to any point five feet above an intersecting centerline, within the runway visibility zone."

The 1995 ALP identified a runway visibility zone that extends from the ends of Runway 22 and 28 to the midpoint of each runway. Although the runways do not actually intersect, maintaining a runway visibility zone (RVZ) is recommended to maintain a high level of safety for aircraft operating in close proximity.

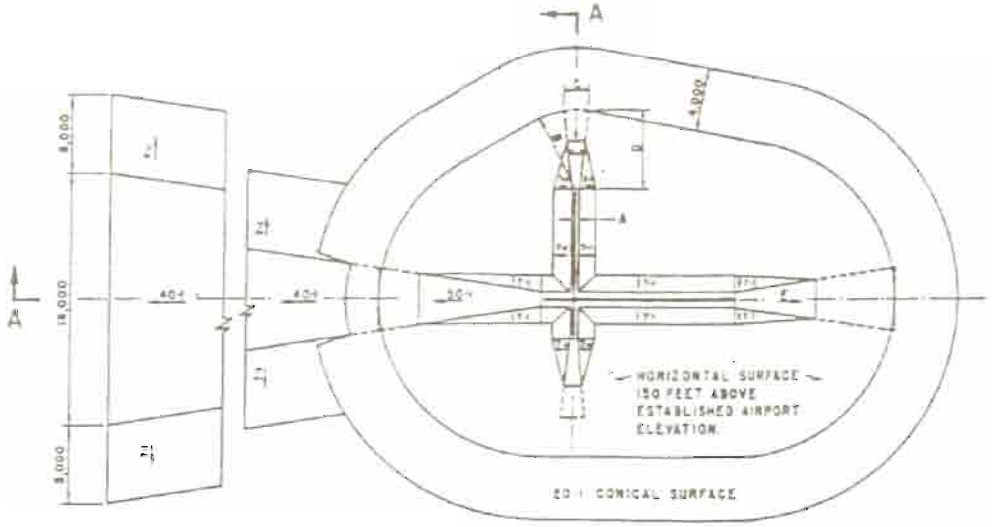
FAR PART 77 SURFACES

Airspace planning for U.S. airports is defined by Federal Air Regulations (FAR) Part 77 – Objects Affecting Navigable Airspace. FAR Part 77 defines imaginary surfaces (airspace) to be protected surrounding airports. **Figure 3-5** on the following page illustrates plan and isometric views of the Part 77 surfaces. **Table 3-6** summarizes the standard airspace dimensions currently recommended for BVS.

TABLE 3-6:
FAR PART 77 AIRSPACE SURFACES

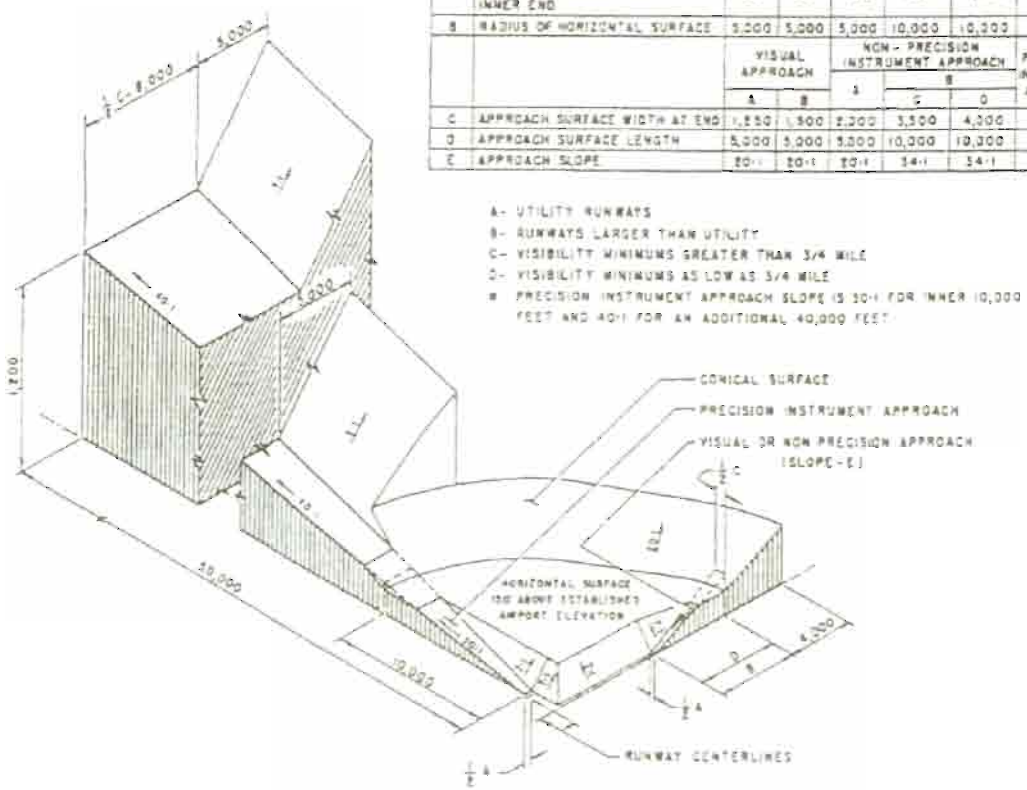
Item	**Runway 10/28** *Other than Utility (Precision)*	**Runway 4/22** *Utility (Visual)*
Width of Primary Surface	1,000 feet	250 feet
Approach Surface Width at End	16,000 feet	1,250 feet
Approach Surface Length	50,000 feet	5,000 feet
Approach Slope	50:1 for 10,000 feet, 40:1 for 40,000 feet	20:1
Horizontal Surface Radius	10,000 feet	5,000 feet

OBJECTS AFFECTING NAVIGABLE AIRSPACE



DIM	ITEM	DIMENSIONAL STANDARDS (FEET)					
		VISUAL RUNWAY		NON-PRECISION INSTRUMENT RUNWAY			PRECISION INSTRUMENT RUNWAY
		A	B	A	B		
					C	D	
A	WIDTH OF PRIMARY SURFACE AND APPROACH SURFACE WIDTH AT INNER END	250	500	500	500	1,000	1,000
R	RADIUS OF HORIZONTAL SURFACE	5,000	5,000	5,000	10,000	10,000	10,000
		VISUAL APPROACH		NON-PRECISION INSTRUMENT APPROACH			PRECISION INSTRUMENT APPROACH
		A	B	A	B		
					C	D	
C	APPROACH SURFACE WIDTH AT END	1,250	1,500	2,000	3,500	4,000	16,000
D	APPROACH SURFACE LENGTH	5,000	5,000	5,000	10,000	10,000	*
E	APPROACH SLOPE	20:1	20:1	20:1	34:1	34:1	*

A- UTILITY RUNWAYS
B- RUNWAYS LARGER THAN UTILITY
C- VISIBILITY MINIMUMS GREATER THAN 3/4 MILE
D- VISIBILITY MINIMUMS AS LOW AS 3/4 MILE
* PRECISION INSTRUMENT APPROACH SLOPE IS 50:1 FOR INNER 10,000 FEET AND 40:1 FOR AN ADDITIONAL 40,000 FEET



ISOMETRIC VIEW OF SECTION A-A

§ 77.25 CIVIL AIRPORT IMAGINARY SURFACES

DESIGNED BY: DM	FAR PART 77 DIAGRAM	CENTURY WEST ENGINEERING CORPORATION 8650 S.W. Redwood Lane, Suite 350 Portland, Oregon 97224 503-419-2130 phone • 503-639-2710 fax www.centurywest.com	FIGURE 3-5
DRAWN BY: JLM			
SCALE: NTS			

FAA Advisory Circular 150/5300-13, Appendix 7[34] **(Item 3. Airport Airspace Plans)** indicates that the FAR Part 77 Airspace Plan includes: *"(1) Plan view of all 14 CFR Part 77 Subpart C surfaces based on ultimate runway lengths. (2) Small scale profile views of ultimate Part 77 Subpart C approaches."*

The 1995 Airspace Plan depicts "other-than-utility" precision instrument approach surfaces for Runways 10 and 28, and "utility" visual approach surfaces for Runways 4 and 22. Based on the existing and planned runway configuration and utilization, these planning assumptions remain valid and should be applied to the updated ALP drawings.

As noted earlier, the current (1999) obstruction chart (OC) prepared for the airport depicts a planned precision approach surface for Runway 10 only; all other runways have visual approach surfaces depicted. Based on the current non-precision approach capabilities for Runway 28, the minimum recommended airspace protection would be a 34:1 slope that extends 10,000 feet. However, for planning purposes, protecting for the ultimate precision approach for both ends of Runway 10/28 will provide the maximum flexibility for future upgrades. The OC depicts airspace surfaces for Runway 4/22 that are consistent with "other-than-utility" runways. As noted above, it is recommended that Runway 4/22 be planned based on "utility" runway standards for visual approaches.

The 1995 Airspace Plan identified a total of ten (10) obstructions to the FAR Part 77 airspace surfaces. However, upon detailed review, it is evident that this representation of obstructions was not consistent with the previously surveyed obstructions documented in airport obstruction charts (OC) for BVS, prepared by the National Ocean Service. The most recent OC (4th edition) was surveyed in 1999 and depicts dozens of individual obstructions (mostly trees) in addition to large areas of tree penetration both adjacent to the runways and within the outlying horizontal surface northwest of the airfield. The obstruction data depicted on an OC is based on an actual survey, which makes it more reliable than other non-surveyed estimates. However, it also recognized that any survey of tree heights should be considered approximate since additional growth may occur.

The obstruction data (location and elevation) obtained from 1999 OC will be integrated into the updated airspace plan being developed in this master plan update. The recommended changes in planned airspace configurations may affect some obstructions that were previously surveyed; these will be documented on the updated plan. No areas of terrain penetration are identified within any of the FAR Part 77 airspace surfaces on the 1995 Airspace Plan or the 1999 OC. A review of

[34] Appendix 7. Airport Layout Plan Components and Preparation

topographical mapping will be conducted to verify the obstruction clearance for the airspace surfaces associated with BVS.

Approach Surfaces

Runway approach surfaces extend outward and upward from each end of the primary surface, along the extended runway centerline. As noted earlier, the dimensions and slope of approach surfaces are determined by the type of aircraft intended to use the runway and most demanding approach planned for the runway.

Runway 10/28

The 1995 Airspace Plan depicts precision approach surfaces for both ends of the runway. The recommended "ultimate" precision approach surfaces are 50,000 feet long with a slope of 50:1 for the first 10,000 feet, then 40:1 for the next 40,000 feet. Three trees were identified as obstructions to the Runway 28 approach surface on the 1995 Airspace Plan (recommended to be removed); a powerline was identified as an obstruction to the Runway 10 approach surface (obstruction lighting recommended). The 1999 OC identifies numerous obstructions within a future precision (50:1) approach surface; several obstructions were also identified within the existing non-precision (34:1) approach surface for Runway 10. As noted earlier, the OC depicts a 20:1 visual approach surface for Runway 28 (no obstructions), although based on current approach capabilities, a 34:1 surface should be protected. These items will be reviewed and updated, as necessary, on the airspace plan.

No areas of terrain penetration are identified within the approach surfaces on the 1995 Airspace Plan. Although full plan views of the 50,000-foot surfaces were not depicted on the 1995 drawing, as now required by FAA, full-length profiles views were provided on a separate drawing. The profiles indicate that areas of high terrain remain below the approach surfaces. For Runway 10, the highest terrain depicted is located on Guemes Island (720 feet MSL), approximately 29,000 feet (5.5 miles) from the runway end. It appears that the terrain elevation is approximately 100 feet below the approach surface elevation in that location. However, there is no indication to what extent the terrain is forested or the height of any trees that may be located in the area. Areas of high terrain are also depicted between 35,000 and 50,000 feet (6.5 to 9.5 miles) from the end of Runway 28. The depicted terrain appears to be just below (less than 100 feet) the approach surface at the highest elevations. However, no references are made about tree heights. As noted above, the relationship of the terrain and the approach surface will be reviewed during preparation of the updated airspace plan drawings.

Runway 4/22

Based on existing and planned visual approach capabilities for the runway, the length of the approach surface is 5,000 feet with a slope of 20:1. The 1995 Airspace Plan identifies three trees as obstructions to each approach surface for Runway 3 and 21 (now Runway 4 & 22) for a total of six obstructions; no action was recommended. The 1999 OC identifies several obstructions (trees, fences, etc.) within the visual approach surfaces for the runway. However, as noted earlier, the OC used "other-than-utility" standards for the runway, which results in larger airspace surface areas. These items will be reviewed and updated, as necessary on the airspace plan. No areas of terrain penetration are identified within the approach surfaces for either runway end.

Primary Surface

The primary surface is a rectangular plane of airspace, which rests on the runway (at centerline elevation) and extends 200 feet beyond the runway end. The primary surface should be free of any penetrations, except items with locations fixed by function (i.e., VASI, runway or taxiway edge lights, etc.). The primary surface end connects to the inner portion of the runway approach surface.

Runway 10/28

The 1995 Airspace Plan and 1999 OC both depict a primary surface for Runway 10/28 that is 1,000 feet wide, based on the planned precision instrument approaches for the runway. No obstructions to the primary surface were identified on the 1995 Airspace Plan; however, the OC identifies numerous obstructions (trees, ground, fences, etc.) in the primary surface. These obstructions should be cleared in conjunction with development of a precision instrument approach to the runway. It was observed during a recent site visit that areas of terrain located between the runway and parallel taxiway (Taxiway A) appear slightly elevated above the runway, which would be consistent with the most recent obstruction survey. The elevation of the primary surface corresponds to the runway centerline elevation at its nearest point; terrain within 500 feet of runway centerline should be graded to remain below the primary surface plane.

Runway 4/22

As a utility-visual runway, the outer edge of the primary surface for Runway 4/22 is located 125 feet from runway centerline. The primary surface appears to be relatively level and free of obstructions. No obstructions to the Runway 4/22 primary surface were identified on the 1995 Airspace Plan; the 1999 OC identifies numerous obstructions (trees, bushes, fences, etc.) within a

500-foot wide primary surface. The use of a 250-foot wide primary surface that is consistent with current and planned use will eliminate the majority of these items, although each noted obstruction will be reviewed.

Transitional Surface

The transitional surface is located at the outer edge of the primary surface, represented by a plane of airspace that rises perpendicularly at a slope of 7 to 1, until reaching an elevation 150 feet above runway elevation. This surface should be free of obstructions (i.e., parked aircraft, structures, trees, etc.).

Runway 10/28

No building or parked aircraft penetrations were identified within the Runway 10/28 transitional surfaces on either the 1995 Airspace Plan or the 1999 OC. However, numerous trees located on both sides of the runway were identified as obstructions with elevations up to 160 feet above runway elevation. The nearest aircraft tiedowns located along Taxiway A that meet the previously noted ADG II taxiway object free area clearance standard are 565.5 feet from runway centerline. At this distance, the transitional surface elevation is approximately 9.4 feet above runway elevation, which allows most small parked aircraft to remain below the protected aircraft surface; larger (taller) aircraft parking positions need to be located to avoid penetrations to the transitional surface.

Runways 10 and 28 also have a transitional surface that extends outward 5,000 feet from the sides of the planned precision approach surfaces, beyond the boundaries of the conical surface. Although the 1995 Airspace Plan did not depict the full length of the Runway 10 and 28 approach surfaces and approach transitional surfaces, no terrain obstructions were noted. A review of topographical mapping will be conducted to verify any obstructions to the surfaces.

Runway 4/22

No terrain penetrations or other obstructions were identified within the Runway 4/22 transitional surfaces on the 1995 Airspace Plan, although the 1999 OC identified numerous obstructions on both sides of the runway. However, as noted previously, the OC reflects "other-than-utility" runway standards for the runway, which results in the transitional surfaces beginning 250 feet from the runway centerline rather than 125 feet (recommended). The use of utility airspace standards for Runway 4/22 will increase vertical clearances for obstructions located within the transitional surfaces on both sides of the runway.

Horizontal Surface

The horizontal surface is a flat plane of airspace located 150 feet above runway elevation with its boundaries defined by the radii (10,000 feet for other-than-utility instrument runways) that extend from each runway end. The outer points of the radii for each runway are connected to form an oval, which is defined as the horizontal surface.

For BVS, the horizontal surface elevation (294 feet MSL) is established based on the published airport elevation (143.8 feet). The 1995 Airspace Plan and 1999 OC do not depict any terrain penetrations within the horizontal surface. A review of topographical mapping will be performed to verify the absence of terrain penetrations. The 1999 OC depicts numerous tree penetrations north and northwest of Runway 10/28 and in the infield area between the two runways. The highest tree elevation is 357 feet, located approximately 8,000 feet north of the end of Runway 10.

Conical Surface

The conical surface is an outer band of airspace, which abuts the horizontal surface. The conical surface begins at the elevation of the horizontal surface and extends outward 4,000 feet at a slope of 20:1. The top elevation of the conical surface is 200 feet above the horizontal surface and 350 feet above airport elevation. No terrain or tree penetrations were depicted within the conical surface on either the 1995 Airspace Plan or 1999 OC.

AIRSIDE REQUIREMENTS

Airside facilities are those directly related to the arrival and departure and movement of aircraft:

- Runways
- Taxiways
- Airfield Instrumentation and Lighting

Runways

The adequacy of the existing runway system at BVS was analyzed from a number of perspectives including runway orientation, airfield capacity, runway length, and pavement strength.

Runway Orientation

The orientation of runways for takeoff and landing operations is primarily a function of wind velocity and direction, combined with the ability of aircraft to operate under adverse wind conditions. As noted earlier, the crosswind coverage for Runway 10/28 exceeds the FAA's recommended criteria for both small and large aircraft, which indicates that the airport's primary runway is generally well aligned with local prevailing wind conditions. Runway 4/22 is often used by small aircraft during crosswind conditions. Based on historical observation data, the frequency of wind conditions that are beyond the capabilities of the two runways combined, is less than 1 percent for most aircraft types. **Table 3-6** summarizes the runway wind coverage for all weather conditions combined (VFR and IFR) for both runways (large and small aircraft).

TABLE 3-6:
BVS WIND COVERAGE
(ALL WEATHER)

Runway	12 MPH or less (direct crosswind)	15 MPH or less (direct crosswind)
10/28	98.9 %	99.39 %
4/22	95.6 %	97.70 %
Combined**	99.6%	99.9%

Source: 1995 ALP; Data from U.S. Dept. of Commerce National Weather Records Center, Ashville, NC. Period: 7/48-6/51 at Mount Vernon. ** Combined coverage estimated by David Miller based on review of original wind rose data.

Runway Length

Runway length requirements are based primarily upon airport elevation, mean maximum daily temperature of the hottest month, runway gradient, and the critical aircraft type expected to use the runway. At BVS, the availability of two runways allows specific design standards to be applied to each runway. A summary of FAA-recommended runway lengths for a variety of aircraft types and load configurations are described in **Table 3-7**. The runway length requirements for a variety of business aircraft are summarized in **Table 3-8** for comparison to the output from the FAA model.

Based on local conditions and the methodology outlined in **AC 150/5325-4A**, a runway length of 5,260 feet is required to accommodate 75 percent of large airplanes (60,000 pounds or less maximum gross takeoff weight) at 60 percent useful load. At 5,477 Runway 10/28 is able to

accommodate 75 percent of the large aircraft fleet with a useful load of approximately 65 percent under the conditions described above.

The FAA model indicates that a length of 6,650 feet is recommended to accommodate 75 percent of large airplanes (60,000 pounds or less maximum gross takeoff weight) at 90 percent useful load. It is noted that the runway length requirements for large aircraft weighing more than 60,000 pounds (such as a B737) are considerably less than for the larger corporate aircraft weighing between 12,500 and 60,000 pounds.

TABLE 3-7:
FAA-RECOMMENDED RUNWAY LENGTHS
(FROM FAA COMPUTER MODEL)

Runway Length Parameters for BVS

- *Airport Elevation: 144 feet MSL*
- *Mean Max Temperature in Hottest Month: 75.1 F*
- *Maximum Difference in Runway Centerline Elevation: 46 Feet*
- *Existing Runway Lengths: 5,477' (10/28); 3,000' (4/22)*

Small Airplanes with less than 10 seats	
75 percent of these airplanes	*2,390 feet*
95 percent of these airplanes	***2,940 feet***
100 percent of these airplanes	*3,490 feet*
Small airplanes with 10 or more seats	*4,030 feet*
Large Airplanes of 60,000 pounds or less	
75 percent of these airplanes at 60 percent useful load	***5,260 feet***
75 percent of these airplanes at 90 percent useful load	*6,650 feet*
100 percent of these airplanes at 60 percent useful load	*5,500 feet*
100 percent of these airplanes at 90 percent useful load	*7,630 feet*
Airplanes of more than 60,000 pounds	*5,060 feet*

The runway length requirements summarized in **Table 3-8** suggest that the majority of small and medium size business jets are currently able to operate on Runway 10/28 under typical load and weather conditions. Although it is likely that passenger and/or fuel load limitations occur for some business aircraft during warmer summer days, the majority of current activity appears to be reasonably well accommodated. According to Corporate Air Center, a local FBO serving itinerant business aircraft, BVS accommodates a wide range of business jets, including some large models (Challenger, Gulfstream, Falcon, etc.); however, some of the largest corporate aircraft reportedly prefer to use Bellingham International Airport, which has a 6,700 x 150-foot runway.

While additional runway length would increase the airport's ability to accommodate a larger portion of aircraft weighing 60,000 pounds or less, the number of aircraft operations currently constrained by the existing runway length is thought to be well below the FAA criteria established for design aircraft. The updated forecasts of aviation activity indicate that the number of operations associated with Approach Category C &D aircraft will increase during planning period. Many of these aircraft would be included in the upper range of runway length requirements for aircraft weighing 60,000 pounds and less.

TABLE 3-8:
TYPICAL BUSINESS AIRCRAFT RUNWAY REQUIREMENTS

Aircraft	Passengers (typical configuration)	Maximum Takeoff Weight	Runway Length Required for Takeoff[1]	Runway Length Required for Landing[2]
Beechcraft King Air 200	6-8	12,500	3,600	2,600
Cessna Citation CJ1	6-7	10,600	3,780	2,830
Cessna Citation CJ2	6-7	12,375	3,590	3,050
Cessna Citation CJ3	6-7	13,870	3,610	3,140
Cessna Citation II	6-9	14,100	4,180	2,550
Cessna Citation Excel	7-8	20,000	3,750	3,260
Cessna Citation VII	7-8	22,450	4,950	3,000
Citation Sovereign	9-12	30,000	3,694	3,214
Cessna Citation X	8-12	36,100	5,340	3,530
Learjet 45	7-9	20,500	4,350(a)	2,660(a)
Challenger 300	8-15	37,500	4,950(a)	2,600(a)
Gulfstream 100 (Astra)	6-8	24,650	5,395(a)	2,920(a)
Gulfstream 200 (G-II)	8-10	35,450	6,080(a)	3,280(a)
Gulfstream 300 (G-III)	11-14	72,000	5,100(a)	3,190(a)

Notes:

1. FAR Part 25 or 23 Balanced Field Length (Distance to 35 Feet Above the Runway); Sea Level, 77-degrees F; Zero Wind, Dry Level Runway, 15-Degrees Flaps, except otherwise noted.
2. Distance from 50 Feet Above the Runway; Flaps Land, Zero Wind.

a. For general comparison only. **Distances based on sea level and standard day temperature** (59-degrees F) at maximum takeoff/landing weight; higher airfield temperatures will require additional runway length and/or reduction in operating weights.

Source: Aircraft manufacturers operating data, flight planning guides.

Based on these long-term factors, establishing a runway extension reserve should be considered in the alternatives analyses. The undeveloped area located beyond the end of Runway 10 extends more than 3,000 feet within current airport property boundaries. This area should be preserved to protect for existing and future instrument approach clearances and facility needs such as an approach lighting system for the existing runway. Establishing a runway extension reserve could

also ensure that the area remains undeveloped until such a time that other aviation needs were realized.

Runway 4/22 accommodates small aircraft (weighing 12,500 pounds or less). Considering its limited use, it appears reasonable to determine its length requirements based on accommodating a moderate percentage of the small airplane fleet. However, according to the FAA model, at 3,000 feet, Runway 4/22 can currently accommodate more than 95 percent of the small airplane fleet.

Runway Width

Runway 10/28 is 100 feet wide. Based on current design criteria and nonprecision instrument approach capabilities, the minimum width recommended for Runway 10/28 is 75 feet. However, based on a planned upgrade to Category I precision instrument approach capabilities, the recommended width for Runway 10/28 would increase to 100 feet for ADG II aircraft (for both Category A&B and C&D aircraft). Therefore, no change in the current width of Runway 10/28 is recommended. Runway 4/22 is 60 feet wide, which meets the ADG I standard.

Airfield Pavement

The airfield pavements at BVS have been assigned a Pavement Condition Rating (PCR), through a 2006 study prepared by Applied Pavement Technology, Inc. and the Washington State Department of Transportation Aviation Division. As identified in the Inventory chapter (Master Plan Chapter 1) the airfield pavements were generally rated in "Fair" to "Excellent" condition in 1999. Limited areas were rated "Poor" or "Very Poor" and these were generally associated with Taxiway F, which receives very limited use.

At the time that the survey was conducted in 2005, Runway 10/28 was assigned a "Very Good" PCR. The future PCR was forecast to be "Very Good" in 2010 and 2015. The future ratings assume that no major maintenance will be performed during the intervening period. Runway 10/28 has an FAA Airport Facility Directory-published gross weight bearing capacity of 19,000 pounds for single-wheel aircraft. A dual rating is not currently published for Runway 10/28.

Runway 4/22 was assigned a "Fair" PCR in 2005 and was predicted to remain in that condition in 2010 and 2015. Runway 4/22 has a FAA Airport Facility Directory-published gross weight bearing capacity of 17,000 pounds for single-wheel aircraft; no dual wheel ratings are currently published for the runway. Additional analysis of runway pavement strength is recommended to

determine an accurate dual wheel weight bearing capacity for existing conditions that can be published by the airport.

As noted earlier, the airport has experienced an increase in larger and heavier itinerant aircraft in recent years. These include, among others, Gulfstream IVs with a maximum gross takeoff weight of 71,780 pounds. As the frequency of operations of these heavier aircraft increase, it is reasonable to expect increased rates of pavement deterioration.

The estimated runway pavement strengths appear adequate to accommodate limited operations by heavier aircraft, which currently occur at BVS. However, runways designed to accommodate a wide range of business aircraft are generally recommended to have a pavement rating of at least 30,000 pounds for aircraft with a single-wheel landing gear; a dual wheel rating between 50,000 and 75,000 pounds is often recommended for this type of aircraft activity. An increase of the pavement strength for Runway 10/28, Taxiway A, and selected apron areas is recommended to address this anticipated need. It would also be desirable to analyze the weight bearing capacity of Runway 10/28 and Taxiway A based on dual wheel landing gear configuration so that accurate pavement strength data can be published in airport facility directories.

Although not identified as a pavement requiring an overlay in the study's six-year PCI Report's Global Maintenance and Rehabilitation Plan, Runway 10/28 has exhibited areas of settlement at drainage crossings along the entire length of the runway. Monitoring of this settling and repair of the transverse drains and soft spots is recommended by FAA. This is consistent with the recommendations presented by Pavement Engineers[35] who identified localized soft spots in multiple areas along the runway. The Pavement Engineers analysis also indicated that a pavement rating of approximately 40,000 pounds single wheel and 55,000 pounds dual wheel could be obtained in Runway 10/28 through correcting the soft spots identified on the runway.

A pavement maintenance report recommends a regular program of maintenance and rehabilitation to maintain airfield pavements. Slurry seals were completed for Runways 10/28 in 1999 and Runway 4/22 in 1996. According to airport management, no additional programmed pavement maintenance projects have been completed on the runways.

A 3" AC overlay is recommended for Runway 4/22 in 2007. Taxiway F is also recommended for reconstruction in 2008. Other short-term projects include rehabilitation and reconstruction of north hangar taxilanes.

[35] Runway 10-28 and Taxiway A Strength Evaluation – Pavement Engineers, May 9, 2003.

Table 3-9 summarizes the six-year unlimited budget major rehabilitation plan for BVS and additional pavement maintenance items anticipated during the current twenty-year planning period.[36] The dates listed in the table are estimates intended to illustrate the general timeframes involved. Actual project scheduling may be adjusted based on funding availability and overall project prioritization, which is reflected in the master plan's updated capital improvement program (see Chapter 6).

TABLE 3-9: SUMMARY OF RECOMMENDED AIRFIELD PAVEMENT MAINTENANCE

Pavement	5-Year Recommended Maintenance	Other Recommended Maintenance During 20-Year Planning Period
Runway 10/28	Crack fill/Vegetation Removal Fog/Slurry Seal (2007+) Repair of Soft Spots and Transverse Drains (2007+)	Fog/Slurry Seal (5-6 yr cycles) Overlay (2016+)
Runway 4/22	Overlay (2007)	Fog/Slurry Seal (5-6 yr cycles)
Taxiway A (10/28 parallel taxiway)	Crack fill/Vegetation Removal Fog/Slurry Seal (2007+)	Fog/Slurry Seal (5-6 yr cycles) Overlay (2019+)
Taxiway B	Crack fill/Vegetation Removal Fog/Slurry Seal (2009)	Fog/Slurry Seal (5-6 yr cycles) Overlay (2020+)
Taxiway C (diagonal exit taxiway)	Crack fill/Vegetation Removal Fog/Slurry Seal (2009)	Fog/Slurry Seal (5-6 yr cycles) Overlay (2020+)
Taxiway D (90-degree exit taxiway)	Crack fill/Vegetation Removal Fog/Slurry Seal (2009)	Fog/Slurry Seal (5-6 yr cycles) Overlay (2020+)
Taxiway F and Apron	Reconstruct (2008)	Fog/Slurry Seal (5-6 yr cycles)
North Hangar Taxilanes *(10/28 Flightline)*	Overlay/reconstruct sections on south side of T-Hangar "C" (2007) Crack fill/Vegetation Removal Fog/Slurry Seal (2009+)	Fog/Slurry Seal (5-6 yr cycles) Overlay/reconstruct (2015-2025)
North Aircraft Parking Aprons *(10/28 Flightline)*	Crack fill/Vegetation Removal Fog/Slurry Seal (2009+)	Fog/Slurry Seal (5-6 yr cycles) Overlay/reconstruct (2015-2025)
North Aircraft Fueling Area (PCC)	Routine Maintenance	Replace joints as needed
South Aircraft Tiedown Apron *(4/22 Flightline)*	Crack fill/Vegetation Removal Fog/Slurry Seal (2009+)	Fog/Slurry Seal (5-6 yr cycles) Overlay (2020+)
South Hangar Taxilanes *(4/22 Flightline)*	Crack fill/Vegetation Removal Fog/Slurry Seal (2009+)	Fog/Slurry Seal (5-6 yr cycles) Overlay (2020+)
Taxiway G *(east half)*	Crack fill/Vegetation Removal Fog/Slurry Seal (2009+); overlay section from south edge of Rwy 28 to Rwy 22 end (2007)	Fog/Slurry Seal (5-6 yr cycles) Overlay (2020+)
Taxiway G *(west half)*	Crack fill/Vegetation Removal Fog/Slurry Seal (2009+)	Fog/Slurry Seal (5-6 yr cycles)
Air Cargo Apron	Crack fill/Vegetation Removal Fog/Slurry Seal (2009+)	Fog/Slurry Seal (5-6 yr cycles)

[36] Applied Pavement Technology, Inc. (2/2006)

The rate of deterioration of airfield pavements increases significantly as they age. A regular maintenance program of vegetation control, crack filling, and seal coating is recommended to extend the useful life of all airfield pavements. It should also be noted that some of the pavement plan's recommended 6-year projects might not be required or appropriate if superseded by other projects such as runway strengthening (which would probably involve an overlay or reconstruction).

Airfield Capacity

As an uncontrolled field, BVS cannot generally accommodate simultaneous aircraft operations on both runways. For planning purposes, airfield capacity calculations are based on a single runway configuration. The capacity of a single runway with a full-length parallel taxiway (with 4 exits) at an uncontrolled airport typically ranges between 60 and 70 operations per hour during visual flight rules (VFR) conditions. Most airports without terminal area radar, an ILS and a control tower cannot accommodate more than 20 to 30 operations per hour in IFR conditions.

The 1995 master plan estimated hourly capacity for Runway 10/28 to be 98 operations during VFR conditions and 59 operations during IFR conditions; "theoretical" annual airfield capacity was estimated at 230,000 operations. In general, this level of annual capacity can only be achieved at airports with air traffic control towers and extensive terminal area radar service and instrumentation that enable highly efficient operations during IFR conditions.

Current and forecast operations at BVS are expected to remain well below reasonable estimates of hourly and annual capacity through the current planning period.

Taxiways

Taxiways are constructed primarily to facilitate aircraft movements to and from the runway system. Some taxiways are necessary simply to provide access between apron and runways, while other taxiways become necessary as activity increases and safer and more efficient use of the airfield is needed.

Runway 10/28

The parallel taxiway (Taxiway A) and four connecting exit taxiways provide efficient access to the runway and no major capacity or service-related improvements are required. Modifying the aircraft holding area at the Runway 28 end of Taxiway A may be required as the adjacent apron

areas are expanded. As noted earlier, the existing runway-parallel taxiway separation for Taxiway A is 500 feet. A relocation of Taxiway to 400 feet from runway centerline could be considered based on FAA design standards.

The main taxiways serving Runway 10/28 are 50 feet wide, which exceeds the ADG II standard of 35 feet. Based on FAA dimensional standards, the taxiways could be narrowed to 35 feet in the future, although the cost of relocating or replacing taxiway edge lighting would also need to be considered in that decision.

Runway 4/22

The parallel taxiway (Taxiway G) and three connecting exit taxiways provide efficient access to the runway. However, the close proximity of two runway ends (22 and 28) and the access taxiway (B) converging in a relatively small area may create the need for aircraft holding areas that are clear of protected areas for both runways. The potential development of a precision approach for Runway 28 requires defining a glide slope critical area (based on the current requirements of an ILS). The configuration of holding areas in this area should be compatible with all planned NAVAID critical areas.

As noted earlier, the existing runway-parallel taxiway separation is 150 feet, which corresponds to the ADG I (small) design standard. However, the taxiway is designed for use by ADG II aircraft. Based on the FAA's indication that the existing runway-taxiway separation distance was not adequate, options to address this issue will be explored in the master plan alternatives evaluation.

Taxiway G is 35 feet wide, which meets the ADG II standard of 35 feet. Since the taxiway was designed to serve a variety of aviation facilities on the 4/22 flightline, including an air cargo apron, use of ADG II design standards is appropriate. With the exception of the runway separation distance, Taxiway G appears to meet all other ADG II dimension standards, including the taxiway object free area.

Access Taxiways

Improvements to existing access taxiways and hangar taxiways/taxilanes will be required during the planning period, in addition to adding new taxiways to access new hangar or apron developments. The access taxiways and taxilanes serving most hangar development areas range from 20 to 25 feet wide; the areas located between many of the hangar rows are fully paved ranging from 50 to 80 feet wide.

Airfield Instrumentation, Lighting and Marking

Navigational Aids

The on-site non-directional beacon (NDB) located at BVS is owned and maintained by the Port. The NDB supports a non-precision instrument approach to Runway 10. On a national basis, the FAA plans to phase out NDBs and other conventional ground-based navigational aids (NAVAID) over time, as satellite navigation (SATNAV) systems are implemented. However, since not all aircraft are currently equipped with the IFR-certified GPS receivers, maintaining an instrument approach based on a conventional NAVAID such as the NDB, allows the airport to maintain current IFR capabilities. For many airports that own older NDBs, the cost of maintaining the unit and an increasingly difficulty in obtaining parts are often the factors that result in decommissioning. However, for planning purposes, it will be assumed that the existing NDB at BVS will be maintained through the planning period.

As noted earlier, the FAA's current program of developing precision instrument approaches using the Wide Area Augmentation System (WAAS) is allowing airports to develop procedures that are nearly comparable to Category I ILS approaches. The FAA has performed a preliminary evaluation of WAAS approaches at BVS and estimates that minimums of 250 feet and ¾-mile visibility may be feasible for Runway 10 or Runway 28, with an approach lighting system. Approach visibility minima increase to 1 mile without an approach light system. The FAA recommends protecting precision instrument airspace surfaces, as defined by FAR Part 77, for runways with existing or planned precision approach capabilities.

Runway 10/28

Runway 10/28 currently supports straight-in non-precision instrument approaches to both runway ends, although the GPS approach to Runway 28 has been temporarily suspended, as noted in the inventory chapter. The 1995 master plan recommended an upgrade to precision instrument approaches for both ends of the runway. Although installation of two conventional instrument landing systems (ILS) is not common for most general aviation airports, the promise of the FAA's new satellite based navigation aid system development, particularly WAAS and the next higher level of precision approach capabilities, the local area augmentation system (LAAS), suggests that multiple precision approaches to different runway ends may become more common in the future. For planning purposes, it is recommended that all ultimate marking, lighting and instrumentation for Runway 10/28 reflect this potential.

Runway 10/28 has medium-intensity runway edge lighting (MIRL), which is the standard for general aviation runways. The MIRL system and other lighting on the runway (REIL, VASI, and

threshold lights) appear to be in good operational condition. However, replacement of older lighting systems may be expected as they become less reliable or parts become more difficult to obtain. The planned replacement of all lighting systems that are more than 20 years old should included in long-term capital programming. VASIs are no longer manufactured and these systems would be replaced with a current-technology visual guidance indicator system such as a precision approach path indicator (PAPI).

Runway 10/28 has visual runway markings with aiming point markings located 1,000 feet from each runway end. These markings are not consistent with the current non-precision instrument approach capabilities associated with both runway ends. Standard non-precision markings include threshold marking bars, runway end numbers and aiming point markings for runways that accommodate jet aircraft. The runway markings should be updated as part of the next runway seal coat or overlay project.

Runway 10/28 is not currently equipped with an approach lighting system. The 1995 ALP identified future medium-intensity approach lighting systems (MALS) with runway alignment indicator lights (RAIL) for both ends of Runway 10/28 based on the planned addition of precision instrument approaches. A typical MALS-R installation extends approximately 2,400 feet beyond the approach end of the runway on the extended runway centerline. The outer 1,000 feet includes several sequenced flashing white lights (RAIL) on centerline. Based on current FAA standards, a Category I precision instrument approach cannot obtain "less than ¾ mile visibility minimums" without an approved approach lighting system, such as a MALS.

It may be more cost effective for the airport to install a MALS-R on the primary instrument runway end, with a less expensive system, such as an omni-directional approach light system (ODALS) on the opposite end. A typical ODALS installation consists of five lighting units that extend approximately 1,500 feet beyond the approach end of the runway on centerline, with two additional units mounted near the corners of the runway. An ODALS or similar system will support visibility minimums as low as ¾ mile for Category I precision approaches.

Runway 4/22

Runway 4/22 has low-intensity runway edge lighting (LIRL) and PAPIs on both ends. The lighting systems are relatively new and are not expected to require replacement during the current planning period.

Runway 4/22 has visual runway markings that are consistent with current and planned use. However, at each end of the runway, three yellow arrowheads are located ahead of each runway threshold bar. The use of yellow markings is consistent with taxiway markings. In cases where taxiways are aligned with a runway, it is appropriate to provide a yellow taxiway centerline stripe

and the yellow arrowheads (pointing to the runway threshold). This marking configuration should be applied beyond the end of Runway 4, on the section of original runway, if aircraft access is maintained between Runway 4/22 and Taxiway F. However on the Runway 22 end, the presence of the yellow arrowheads may inadvertently lead pilots who are unfamiliar with the airfield layout to taxi directly from Taxiway B through the paved area located between the ends of Runway 22 and 28 to reach the end of Runway 22 for takeoff. Damage of runway edge and threshold lights may occur as aircraft deviate from the recommended taxiways. To reduce this risk, the markings beyond the end of Runway 22 should be changed so that pilots will be able to consistently recognize and remain clear of the non-movement areas. The use of chevron type markings to denote the non-movement area is recommended.

A compass rose is located beyond the end of Runway 4, on an unused section of original runway. Relocating the compass rose is recommended as part of the reconfiguration of Runway 4/22 and the extension of taxiway access from Taxiway F and G. Options for relocating the compass rose will be addressed in the alternatives analysis.

Taxiway Lighting

The main access taxiways (Taxiway A and G) on the airfield have edge lighting (Taxiway A: MITL; Taxiway G: LITL), which is adequate for existing and future use. Most secondary taxiways and taxilanes on the airport do not have edge lighting or reflective edge markers. Reflective markers are recommended for all unlighted taxiway or taxilane edges that are adjacent to unpaved areas; markers are not generally installed on hangar taxilanes that directly abut buildings.

Airfield Signage

The existing lighted airfield signage (location, mandatory, directional, destination, and distance remaining signs) are in good condition and appear to be adequate for current operations. Additional mandatory signs will be required when a precision instrument approach is added to Runway 10/28. Depending on the runway and taxiway configuration, a red "ILS" sign may need to identify an aircraft holding area that is outside the Navaid critical areas.

Airfield Lighting

The existing airport beacon appears to be in good operational condition, although concerns about light emissions (glare) for nearby residential areas may be mitigated by relocating the beacon near the terminal building. The lighted wind cones on the airfield appear to be adequate, although providing additional wind cones near the ends of Runway 10 and 4 may be helpful to pilots in recognizing surface wind conditions.

On-Field Weather Data

The airport has an automated weather observation system (AWOS), which allows aircraft licensed under FAR Part 135 (air taxi/charter) to operate in IFR conditions at BVS.

LANDSIDE FACILITIES

For general aviation airports, landside facilities are generally defined as those that serve aircraft, passenger needs and their related functions. At BVS, landside facilities include aircraft aprons, hangars, passenger terminal building, air cargo facilities and FBO facilities.

The airport currently has two FBOs. Each FBO provides services in the immediately vicinity of their buildings and along the flightlines that parallel the two runways. These factors make projecting landside requirements difficult, since some degree of duplication results from the operation of multiple FBOs. In addition, the use of mobile fuel trucks by the FBOs allows fueling operations to be extended beyond a specific area.

The development of landside facilities on different parts of an airport will often result in split operations for FBO and fueling services, which in turn, creates additional demand for hangar and aircraft parking space. Airports with split operations generally require more extensive taxiway systems and longer taxi distances for aircraft. To the extent feasible, it is preferable to minimize taxiing distances and reduce the frequency of runway crossings by providing adequate landside facilities, such as aircraft parking and hangars, capable of supporting each development area. However, local market conditions generally dictate the economic feasibility of serving physically separated landside facility areas with services such as fuel.

Although the acreage comprising BVS is expansive, large portions of the airport contain wetlands. As a result, the amount of undeveloped land suited for aviation related development that does not contain substantial wetland areas is relatively limited. This includes a portion of the area beyond the east end of the 10/28 flightline; the Runway 4/22 flightline (the area between the original Taxiway G and the runway); and a narrow area along the west side of Taxiway F, adjacent to the PACCAR site. When combined, these areas appear to have adequate capacity to accommodate current forecasts of facility demand and modest development reserves. However, because the overall acreage is relatively scarce it should be preserved to accommodate aviation related land uses.

Aircraft Parking and Tiedown Apron

At most general aviation airports, aircraft aprons provide parking for locally based aircraft that are not stored in hangars and for transient aircraft visiting the airport. At BVS, existing aircraft apron areas accommodate the following activities:

- *Light Aircraft Tiedowns*
- *Business Aircraft Parking*
- *Scheduled and Charter Commercial Passenger Flights*
- *Air Cargo Aircraft Parking and Operations*
- *Helicopter Parking*
- *Aircraft Fueling Area*

The aircraft parking aprons located along the Runway 10/28 flightline accommodate all of the activities identified above. The apron located along the Runway 4/22 flightline, near the end of Runway 22, also accommodates light aircraft tiedowns and previously accommodated a temporary aircraft fueling area. An air cargo apron is located near the midpoint of Runway 4/22. A new FBO hangar and apron is located near the end of Runway 4. There are approximately 112 designated aircraft tiedowns at BVS divided among the seven aprons. Future parking requirements are summarized at the end of this chapter in **Table 3-11**.

It appears that the gross number of existing aircraft tiedowns is adequate to accommodate current and future forecast demand. However, a reduction in overall existing parking capacity may occur as facilities are reconfigured to accommodate a variety of facility improvements such as expanded corporate aircraft parking, helicopter parking, and fueling areas. Based on the amount of apron area currently available, it is recommended that future needs for specific types of aircraft parking consider reconfiguration of existing apron areas in addition to apron expansion.

In order to address a variety of potential events and the uncertainty associated with long-term demand, aircraft apron reserve areas should be identified to preserve the airport's ability to accommodate user needs. A development reserve area equal to 100 percent of the 20-year parking demand will provide a conservative planning guideline to accommodate unanticipated demand, changes in existing apron configurations, and demand beyond the current planning period. The location and configuration of the development reserves will be addressed in the alternatives analysis.

Light Aircraft Parking (Local and Itinerant)

Approximately 55 locally-based aircraft were parked in reserved tiedowns at BVS when counts were updated in January 2005. Over the last ten years, a shift in preference toward hangar storage has resulted in a decline in the number of aircraft parked in reserved tiedowns. **Table 3-10** highlights the recent shift in hangar and tiedown utilization at BVS.

TABLE 3-10:
BVS BASED AIRCRAFT TIEDOWN & HANGAR UTILIZATION

	1993	January 2005
Total Based Aircraft	143	158
Based Aircraft in Reserved Tiedowns	87	55
Aircraft Stored in Hangars	56	103
Percentage of Based Aircraft Stored in Hangars	*39%*	*65%*

Approximately 35 percent of locally-based aircraft are currently parked in reserved tiedowns, down from 61 percent in 1993. This recent trend is expected to continue with based aircraft tiedown use to gradually decline to 20 percent by the end of the planning period. Based on these assumptions, 44 light aircraft tiedowns will be required for locally-based aircraft by 2025.

FAA **Advisory Circular 150/5300-13** suggests a methodology by which itinerant parking requirements can be determined from knowledge of busy-day operations. At BVS, the demand for itinerant parking spaces was estimated based on 25 percent of busy day itinerant operations (25% of busy day itinerant operations divided by two, to identify peak parking demand). The FAA planning criterion of 360 square yards per itinerant aircraft was applied to the number itinerant spaces to determine future itinerant ramp requirements. By the end of the twenty-year planning period, itinerant aircraft parking requirements are estimated to be 29 light aircraft tiedowns.

Corporate Aircraft Parking

The airport accommodates regular itinerant business aircraft activity including turboprops and business jets. One of the unique features of BVS is that several areas are available for corporate aircraft parking, some of which are associated with specific FBO lease areas; additional space for large aircraft parking is located adjacent to the terminal building.

Initially, four to six parking positions (drive through) for transient business aircraft should be adequate to accommodate current demand. However, as noted earlier, the development of separate FBOs on the airport is expected to result in an increase in the number of business aircraft parking positions that are available.

The anticipated increase in larger business jet activity at BVS indicates a need to provide designated parking spaces for heavier corporate aircraft. The designated corporate aircraft parking positions should be capable of accommodating the same design aircraft as the main runway and taxiway system. Additional area for corporate aircraft parking should be reserved to accommodate future demand, either through expansion of apron areas, reconfiguration of existing aprons, or a combination of both.

Commercial/Air Taxi Parking

As indicated in the updated aviation activity forecasts, it is anticipated that BVS will continue to receive scheduled passenger service by small aircraft. Based on forecast activity, it appears that two or three short-term parking positions will be adequate to accommodate Cessna Caravan or smaller single engine aircraft commonly used in to serve the local and San Juan Island market. The area located directly in front of the terminal building should be reserved for this activity; these positions would also be used for passenger loading and unloading activities for air taxi charter flights and other transient aircraft.

Air Cargo Aircraft Parking

There are currently three areas used for air cargo aircraft parking at BVS: a leased area located adjacent to the Methow Aviation hangar; the air cargo apron adjacent to Taxiway G; and one large aircraft tiedown located at the west end of the 10/28 flightline that is used daily by a FedEx Caravan.

The air cargo apron has six aircraft tiedowns configured for larger aircraft such as the Caravan or other single-engine and multi-engine aircraft commonly used by small cargo carriers. Although the number of parking positions could be reduced if cargo buildings or hangars are constructed on the adjacent lots, the air cargo apron appears to have adequate capacity to accommodate current and forecast demand for aircraft parking. Since use of the air cargo apron has not yet reached a significant level, the apron could also be used to accommodate other aircraft parking needs on an interim basis.

FedEx operations at BVS are currently located in a leased building on the Runway 10/28 flightline (east end). FedEx aircraft loading and daytime parking are also located on the Runway 10/28 flightline (west end). Relocating this activity to the air cargo apron would be consistent with planned use of the air cargo apron. However, the absence of existing building space to lease or the cost of constructing a new owner-occupied building adjacent to the cargo apron appear to be factors currently limiting use of the cargo apron.

Helicopter Parking

BVS accommodates several locally-based helicopters and itinerant aircraft. Most locally-based helicopters are stored in hangars, although it is not uncommon for some of these aircraft to be parked in the light aircraft tiedown areas during the day. The increasing amount of helicopter flight training activity at BVS suggests a need for a parking area that is compatible with adjacent fixed wing parking areas. Ideally, helicopter parking areas should be physically separated from light aircraft tiedowns to reduce the effect of rotor wash of light aircraft. Although the number of tiedown positions located along the Runway 10/28 flightline appears to be adequate to accommodate current demand, some reconfiguration of parking areas should be considered to initially provide a designated helicopter parking area with space for 4 to 6 aircraft.

Aircraft Fueling Areas

New common-use aircraft bulk fuel storage and dispensing areas have been constructed on the Runway 4/22 and 10/28 flightlines. The 4/22 fueling area is located near the midpoint of the runway with a new apron that has direct access to Taxiway G. The 10/28 fueling area is located near the west end of the flightline. The development of the new 10/28 fueling area eliminated several existing aircraft tiedowns and required a reconfiguration of tiedowns and taxilane access on the west end of the apron.

The existing underground fuel storage tanks and fueling area located adjacent to the terminal building will continue to operate until the end of the existing lease (expires June 30, 2007). The existing tanks and fuel island will then be removed and the area converted to aircraft parking.

Aircraft Hangars

In Winter 2005, BVS had 21 hangars in use or under construction, including 5 commercial conventional hangars; 11 multiple unit T-hangar or connected executive hangars; and 5 small/medium conventional or individual executive hangars. Not including the commercial use hangars, which accommodate a variety of FBO, cargo and aircraft maintenance activities, in addition to aircraft storage, it is estimated that there currently are approximately 107 individual hangar spaces at BVS. T-hangars and executive hangars are assumed to have space to accommodate one aircraft per unit, although it is likely that multiple aircraft are often stored in single hangars.

Including the five commercial hangars, overall hangar capacity at BVS is estimated to be approximately 130 to 140 aircraft. However, the amount of recent hangar construction at BVS suggests that the commercial hangars are largely utilized and demand for aircraft storage is being met largely through new construction.

It is estimated that approximately 101 (65 percent) of the airport's current based aircraft are stored in hangars, up from 56 (less than 40 percent) in 1993. As noted earlier, both the actual number and the overall percentage of aircraft parked on aprons have declined in recent years. For planning purposes, it is assumed that the growing trend toward hangar utilization will continue during the planning period, from the current level to approximately 80 percent by the end of the twenty-year planning period. It is also assumed that existing hangar space is committed and all additional demand will be met through new construction.

A planning standard of 1,500 square feet per based aircraft stored in hangars is used to project gross space requirements. As indicated in the aviation activity forecasts, the number of based aircraft at BVS is projected to increase by 63 aircraft during the twenty-year planning period. This includes 8 new aircraft that were expected to relocate to BVS by mid-2005 to occupy new hangar units on the Runway 4/22 flightline. Based on a projected 80% hangar utilization level, additional long-term demand for new hangar space (not including the 10 units currently under construction) is estimated to be 42 spaces (approximately 63,000 square feet). The projected hangar requirements for aircraft storage at BVS are presented in **Table 3-11.**

TABLE 3-11:
APRON AND HANGAR
FACILITY REQUIREMENTS SUMMARY

Item	Base Year (2005)	2010	2015	2020	2025
Based Aircraft (on-airport) (Forecast)	164	182	203	211	219
Aircraft Parking Apron ***(Existing Facilities)***					
Single Engine Aircraft Tiedowns	91				
Twin Engine Aircraft Tiedowns	12				
Turbine Aircraft Tiedowns	3[1]				
Helicopter Parking Spaces	*				
Air Cargo Aircraft Parking Spaces	6				
Total Parking Spaces Available	112				
Total Useable Apron Area	50,300 sy (estimated)				
Projected Needs *(Demand)* [2]					
Itinerant Aircraft Parking (@ 360 SY each)		24 spaces / 8,640 sy	26 spaces / 9,360 sy	28 spaces / 10,080 sy	29 spaces / 10,440 sy
Locally-Based Tiedowns (@ 300 SY each)		55 spaces / 16,500 sy	51 spaces / 15,300 sy	42 spaces / 12,600 sy	44 spaces / 13,200 sy
Business Aircraft Parking Demand (@ 625 SY each)		6 spaces / 3,750 sy	8 spaces / 5,000 sy	10 spaces / 6,250 sy	12 spaces / 7,500 sy
Helicopter Parking Positions (@ 625 SY each)		4 spaces / 2,500 sy	6 spaces / 3,750 sy	7 spaces / 4,375 sy	8 spaces / 5,000 sy
Air Cargo Aircraft Parking Demand (@ 625 SY each)		3 spaces / 1,875 sy	4 spaces / 2,500 sy	4 spaces / 2,500 sy	5 spaces / 3,125 sy
Total Apron Needs		**92 spaces 33,265 SY**	**95 spaces 35,910 SY**	**91 spaces 35,805 SY**	**98 spaces 39,265 SY**
Aircraft Hangars ***(Existing Facilities)***					
Existing Hangar Spaces	107-140 191,000 sf (estimated)				
Projected Needs *(Demand)* [3]					
(New) Hangar Space Demand (@ 1,500 SF per space) *(Cumulative 20-year projected demand: 42 spaces / 63,000 SF)*		**+13 spaces / 19,500 sf**	**+17 spaces / 25,500 sf**	**+6 spaces / 9,000 sf**	**+6 spaces / 9,000 sf**

1. Parking for business aircraft adjacent to FBO/Terminal; additional areas of apron are also available.
2. Aircraft parking demand levels identified for each forecast year represent forecast gross demand.
3. Hangar demand levels identified for each forecast year represent the net increase above current hangar capacity.

In addition to aircraft storage, additional demand for business-related and commercial hangar needs should also be expected. Specialized aviation service businesses such as engine & airframe repair, avionics, interior and paint shops generally prefer locations that provide convenient aircraft access. Highly successful aviation service businesses generally rely on both locally-based aircraft and their ability to attract customers from outside the local area. While there is no specific formula to predict demand for general aviation service businesses at a particular airport, reserving several spaces for larger commercial hangars is recommended.

At BVS, the remaining limited undeveloped landside areas located at the east end of the Runway 10/28 flightline should be reserved for larger commercial hangars and related development. Although the area has specific development limitations created by its proximity to the runways and the adjacent roadway, the area should be reserved for tenants that require larger building sizes. It appears that the Runway 4/22 flightline could also accommodate this type of development. The west end of the flightline (beyond the current end of Runway 4) has several previously defined lots available for aviation related development.

Individual aircraft owners needs vary and demand can be influenced by a wide range of factors beyond the control of an airport. In addition, the forecasts of based aircraft reflect very modest growth rates that could be easily exceeded if economic conditions are favorable. For this reason, it is recommended that additional hangar development reserves be identified to accommodate any unanticipated demand. The address the uncertainty of hangar market conditions and demand factors, conservative development reserves should be established to accommodate a combination of conventional hangars and T-hangars, roughly equal to 100 percent of the 20-year forecast demand.

FBO Facilities

Two FBO facilities are currently located on the airport, one on each flightline. The specific facility needs of each FBO are determined by tenant requirements and are generally addressed within lease areas.

Aircraft Wash Down Facilities

Wash down facilities are recommended to accommodate general aviation aircraft with a catch basin and hard piping to divert wash residue into the sanitary sewer system. Wash facilities are typically sized to accommodate one aircraft on pad approximately 50 feet by 50 feet. The wash

pad may be located adjacent to existing parking apron or hangars; close access to utility systems is a key siting factor.

Airport Terminal Facilities

The terminal building can currently accommodate one scheduled operator with counter space, an office and common passenger waiting areas and restrooms. The overall area available appears to be adequate to accommodate the passenger demand levels anticipated with future commercial service at BVS. However, the terminal should have adequate space reserved to accommodate the potential requirements of multiple small carriers including ticket counter and office space. No specific baggage claim or security screening space requirements are anticipated based on the type of commercial service that would be offered at the airport.

Surface Access Requirements

The primary surface access to the airport is provided by Higgins-Airport Way, which connects to State Route 20. As noted in the inventory chapter, a major upgrade project is planned for SR20, including widening. Signalization at the Higgins-Airport Way intersection is planned based on existing levels of service as part of a future WSDOT project. Based on the anticipated growth of both airfield and industrial park-generated vehicle activity at BVS, signalization of the intersection is considered to be a significant safety related need.

On-airport access roads serve all currently developed landside areas of the airfield. Improvements to Crosswind Drive currently extend to the end of Runway 4, where a vehicle turnaround is located. Continued westward expansion along the 4/22 flightline will require additional improvements to the roadway. However, since Crosswind Drive is located on the former Taxiway G, existing pavement extends to the connection with Taxiway F. Any development along Taxiway F would require surface access improvements. Several undeveloped lots located near the south end of Taxiway F will require vehicle access if they are developed. Options for providing access directly from Ovenell Road or Crosswind Drive should be considered for this area.

The development of landside facilities on opposite sides of an airport's main runway generally contributes to an increase in airport ground vehicle activity. To maintain a safe operating environment, only airport maintenance, emergency and snow removal vehicles should be permitted on the runway-taxiway system. Based on dual flightline configuration at BVS, development of an internal airport access road is recommended beyond the end of Runway 28 for all vehicle movements not requiring runway or taxiway access. The access road must be located outside runway safety areas; it is recommended that the road alignment reflect "future" design

standards so that relocation will not be required to accommodate the anticipated upgrade in design aircraft or instrument approach capability. It is also recommended that the roadway be located outside of the future runway object free areas and that vehicles traveling on the roadway do not penetrate any ultimate FAR Part 77 airspace surfaces.

Note: In 2006, a new internal airport access road was constructed around the end of Runway 28 to connect the 10/28 and 4/22 flightlines.

Existing vehicle parking in the vicinity of both flightlines appears to be adequate. There are four separate vehicle parking lots in the terminal area with more than 100 available spaces; additional parking is located adjacent to most commercial use buildings. The north side of Crosswind Drive is configured with 90-degree parking positions. Parking for more than 300 vehicles could be provided along the road adjacent to the Runway 4/22 flightline; additional parking could be provided along the flightline as development continues west of the current runway.

The requirements for providing designated vehicle parking areas adjacent to hangars vary greatly at small airports. A planning standard of 0.5 to 1.0 vehicle parking spaces per based aircraft will accommodate the most common parking demand levels. For larger hangars, a formula based on the square footage of the building is often used to determine parking requirements. This is a common approach for establishing off-street parking in most communities.

Agricultural Aircraft Facilities

There are currently no designated agricultural aircraft facilities at the airport. If needed, adequate space exists on the airport to reserve an area to locate future AG facility needs.

SUPPORT FACILITIES

Aviation Fuel Storage

Aviation gasoline (AVGAS) and jet fuel are available at BVS through a variety of underground and aboveground storage tanks and mobile fuel trucks. The existing underground tanks are owned by the Port and operated through competitive bid by one of airport's fixed base operators. The underground tanks and fueling area are located adjacent to the terminal building. The underground tanks will continue to be used until the end of their existing lease (expires June 30, 2007). The existing tanks and fuel island will then be removed and the area converted to aircraft parking.

The recent development of new bulk fuel storage areas on both of the airport's main flightlines will accommodate all future on-airport aviation fuel storage tanks. The bulk storage areas will support fixed-point fueling (card lock) and stocking of mobile fuel trucks. The two bulk storage areas will be able to accommodate up to eight 12,000-gallon tanks, for a total capacity of 96,000 gallons, which should be adequate to accommodate forecast demand through the current planning period.

The development of secondary containment areas for mobile fuel trucks is also recommended. Since most mobile fuel trucks in use today have single-wall construction, they do not provide the secondary containment of double-wall aboveground bulk storage tanks. It is expected that new federal or state regulations will eventually require secondary containment for single-wall tank mobile fuel trucks when unattended, such as for overnight parking when the trucks are not in service or otherwise monitored. It is anticipated that the secondary containment areas for airport fuel trucks will be located in close proximity to the bulk fuel storage areas.

Airport Utilities

The existing utilities on the airport appear to be adequate both in capacity and service within the developed areas of the airport. Extensions of water, sanitary sewer, electrical, and telephone service to serve future landside developments may be required. All powerlines located on Port property are required to be buried per Commission policy.

Security

The airport has limited wire fencing on its boundary and chain link fencing with electronic gates in the terminal area and along the Runway 4/22 flightline. There are no major security concerns at the airport, although providing chain-link fencing and gates along the entire frontage or adjacent to all operations areas is recommended. Flood lighting should be provided in expanded aircraft parking and hangar areas and any other new development areas on the airport to maintain adequate security. An airport security plan[37] was completed in July 2005 that recommended specific facility upgrades and procedures. Upgrading several unlocked pedestrian gates with combination locks; providing additional automated vehicle gates as landside development

[37] Skagit Regional Airport – Security Plan (Century West Engineering; David Evans & Associates, 2005)

expands, and fencing the remaining exposed areas of the airport operations areas are among the recommended improvements.

FACILITY REQUIREMENTS SUMMARY

The projected twenty-year facility needs for BVS are summarized in **Table 3-12**. As noted in the table, maintaining and replacing existing pavements represents a significant facility need. The updated forecasts of aviation activity anticipate moderate growth in activity that will result in similarly moderate airside and landside facility demands beyond existing capabilities. The existing airfield facilities have the ability to accommodate a significant increase in activity, with targeted facility improvements. For the most part, the need for new or expanded facilities, such as aircraft hangars, will be market driven, although there will be significant front-end investments required in preparation, utility extensions, road extensions, and taxiway construction.

TABLE 3-12:
FACILITY REQUIREMENTS SUMMARY

Item	Short Term	Long Term
Runway 10/28	Pavement Maintenance[1] Update Runway Markings to Nonprecision Repair Soft Spots on Rwy. to increase weight bearing capacity for design aircraft. RSA Compaction (Evaluation) Primary Surface Terrain Clearances (Evaluation)	Upgrade Runway Markings (precision) Pavement Maintenance[1] Overlay Runway Extension Reserve (Rwy 10 end)
Runway 4/22	Pavement Maintenance[1] Correct Runway End Pavement Markings Shift Runway (on centerline to clear east end of Rwy 10/28 flightline)	Pavement Maintenance[1] Shift Runway (lateral) Overlay
Taxiways	Pavement Maintenance[1] Overlay Taxiway A Upgrade Aircraft Holding Areas at Runway 28 and 22 ends. Reconfigure Taxiway B to include holding areas, increase radius on fillet, mark or remove unusable pavement.	Pavement Maintenance[1] Taxiways/Taxilanes to New Hangar Areas Overlay Taxiway G (east half) Narrow Taxiway F to 35 feet Evaluate Taxiway A prior to next major rehabilitation project (consider 400-foot runway separation and 35-foot width)
Aircraft Aprons	Reconfigure/Expand Apron to accommodate helicopter parking and corporate AC parking. Increase weight bearing capacity for design aircraft in designated large AC parking areas. Remove 3 Light Aircraft Tiedowns located inside Taxiway A OFA. Pavement Maintenance[1]	Pavement Maintenance[1] Overlay Main Apron/Tiedown Aprons Apron Development Reserves
Hangars	Reserves for T-hangar and Conventional Hangar Development	Same
Navigational Aids and Lighting	PAPI (Rwy 10 & 28) Relocate Compass Rose in conjunction with Rwy 4/22 reconfiguration.	ILS or LAAS Precision Approach MALS-R for Precision Runway End (10 or 28) ODALS for opposite end of precision runway
Fuel Storage	Bulk Fuel Storage Areas (Runway 10/28 and 4/22 Flightlines - *Done in 2006*) Remove Existing UST Secondary Containment Area for Fuel Truck Parking	Expansion reserves adjacent to bulk storage areas
FBO	Accommodate within defined landside development areas (vacant lease areas)	Same
Utilities	Extend Service to New Development Areas	Same
Roadways	Construct New Internal Airport Service Road to Connect 4/22 and 10/28 Flightlines Extend Roads to New Development Areas	Extend Roads to New Development Areas
Security	Extend Perimeter Fencing Flood Lighting	Same

1. Vegetation control, crack fill, seal coat, slurry seal, localized patching, joint rehabilitation, etc., as required.

Skagit Regional Airport
Airport Master Plan Update

Chapter Four

Airport Development Alternatives

CHAPTER FOUR
AIRPORT DEVELOPMENT ALTERNATIVES

The airport development alternatives process used for the master plan update involved several steps that began with developing preliminary alternatives concepts in April 2005 and concluded in September 2005 with the refinement of the selected preferred alternative. The development alternatives were developed by the Consultant in close coordination with Port staff, the Master Plan Advisory Committee and the FAA.

INTRODUCTION (PRELIMINARY ALTERNATIVES)

The purpose of this evaluation is to develop alternatives capable of accommodating the forecast demand and facility needs defined in the previous master plan chapters. As noted in the facility requirements evaluation, current and long-term planning for Skagit Regional Airport is based on maintaining and improving the airport's ability to serve a wide range of general aviation and business aviation aircraft. Based on the recently updated activity forecasts, the development needs associated with landside facilities (aircraft parking spaces, hangars, etc.) at BVS are expected to be moderate during the current 20-year planning period. However, potential facility reconfigurations or redevelopment that may be required to address specific needs or design standards may require additional facility improvements.

The preliminary alternatives represent the first step in a multi-step process. The alternatives concepts were initially evaluated to identify general preferences for both individual items and the overall concepts being presented. The process allowed the widest range of ideas to be considered and the most effective facility development concept to be defined. From this evaluation process, elements of a preferred alternative emerged that could best accommodate all required facility improvements.

Previous Master Plan Development Recommendations

The process of evaluating new development options began by reviewing the recommended facility configurations from the most recent (1995) airport layout plan (ALP), recent facility

developments and current land leases. The Port has adopted a "binding site plan" within the developed flightlines at Skagit Regional Airport that define individual lease parcels. The lease lot configurations defined on the binding site plan have been retained for the preliminary analysis of development alternatives. However, subsequent changes in parcel boundaries may be appropriate based on the configuration of the preferred alternative.

The general theme of 1995 ALP focused on the development of new facilities along the Runway 4/22 flightline, with future "Aviation Dependent Flightline Expansion" identified along the undeveloped portions of the 10/28 flightline. Although wetland areas were depicted on the 1995 ALP, proposed development areas did not attempt to avoid wetlands. However, more detailed definitions of wetlands have since been performed on the airport and non-wetland areas have been clearly defined to identify development areas. As a result, there has been a significant reduction of readily-developable land areas on the 10/28 flightline compared to what was depicted on the 1995 ALP.

Development on the 10/28 flightline has included construction of several new executive hangars and the new FBO hangar at the east end of the flightline in addition to roadway and vehicle parking improvements, and some reconfiguration of aircraft parking positions.

The ALP depicts new landside facilities on the 4/22 flightline with an east-to-west development pattern including an aircraft tiedown apron, four T-hangars, auto parking, a second aircraft tiedown apron, and a cargo apron and multi-use cargo facility. The development of an access taxiway (Taxiway G) was recommended to provide access along the eastern 3,000 feet of the flightline. The remainder of the 4/22 flightline was reserved for future development including: "Phase II - Aviation Dependent Flightline" and "Phase III Aviation Related Development."

Over the last ten years, new construction on the 4/22 flightline has included a light aircraft tiedown apron, air cargo apron, hangar taxilanes, a major access taxiway (G), several hangars, access road and vehicle parking, relatively similar to the planned layout depicted on the 1995 ALP. New or near-term planned improvements include a new FBO and aircraft fuel apron.

PRELIMINARY DEVELOPMENT ALTERNATIVES

Based on the facility needs defined through the updated forecast and facility requirements analyses, three preliminary alternatives concepts were developed in addition to the "Do Nothing/No-Action" alternative:

- *Alternative 0 – Do Nothing/No-Action Option*
- *Alternative 1 – Maintain Existing Development Pattern*

- *Alternative 2 – Commercial Development 10/28 Flightline Option*
- *Alternative 3 – Long-Term Land Development Option*

Alternative O maintains existing facilities and includes no new development. This option does not address forecast facility demands anticipated during the twenty-year planning period. Alternatives 1 and 2 address facility improvement options; Alternative 3 addresses airport land use options. The land use options are based on the concept of developing limited areas of wetlands that are located immediately adjacent to the 10/28 flightline in order to consolidate development rather than moving to the infield portion of the airport, which also contains substantial wetland areas. As presented in preliminary form, Alternatives 1 and 2 are constrained by existing wetlands near the end of Runway 28. The preliminary development alternatives are depicted in **Figures 4-1, 4-2 and 4-3**.

Preliminary alternatives 1, 2, and 3 each include a runway extension reserve at the west end of Runway 10/28 and a relocation of Taxiway A based on FAA-recommended design standards. The runway extension reserve (1,173 feet) corresponds to the runway length requirement (6,650 feet) from the FAA computer model for a moderate portion of the large aircraft fleet (aircraft weighing less than 60,000 pounds.[38] Based on current conditions and forecast activity, the need for a runway extension does not appear likely within the twenty year planning period. However, by establishing a development reserve, it ensures that no other facilities would be inadvertently constructed that would conflict with a potential runway extension.

The proposed parallel taxiway relocation for Runway 10/28 reflects the FAA design standard based on future airport reference code (ARC) D-II with precision instrument approaches. The relocation of the taxiway would allow some additional flexibility for development on the 10/28 flightline, although significant increases in landside facilities cannot be achieved due to the required clearances for the protected FAR Part 77 airspace surfaces (particularly the primary and transitional surfaces). However, the current configuration of the aircraft holding area at the end of Runway 28 limits expansion of aircraft apron at the east end of the 10/28 flightline. Relocation of the parallel taxiway would increase the separation that could be provided between the aircraft holding area and the adjacent apron. If the taxiway is not relocated, a reconfiguration or elimination of the holding area could be considered to accommodate continued easterly expansion of the adjacent apron.

[38] FAA Runway Length Requirements for Large Airplanes 60,000 pounds or less; 75 percent of these airplanes at 90 percent useful load.

The addition of a new internal airport service road is depicted beyond the end of Runway 28. The proposed access road is located outside the runway safety area and object free area for both runways. The road is intended to provide a defined travel route for airport maintenance vehicles, fuel trucks and maintenance vehicles needing to move between the Runway 10/28 and 4/22 flightlines. Vehicle access to the runway-taxiway system should be limited to airport management, maintenance, snow removal and emergency equipment.

ALTERNATIVE 0 -DO-NOTHING/NO-ACTION

Alternative 0 does not include the development of any aviation-related facilities or use of additional land for aviation-related development. As a result, the existing airfield configuration would remain unchanged from its present configuration. Under this alternative, the status quo would be maintained through the current planning period and the airport would essentially be operated in a "maintenance-only" mode.

The primary result of this alternative would be the inability of the airport to adequately accommodate forecast aviation demand and the associated demand-driven facility requirements. In addition, this alternative would not address facility requirements associated with conformance to FAA design standards, FAR Part 77 protected airspace, capacity, safety or security. Future aviation activity would be constrained by the capacity, safety and operational limits of the existing airport facilities.

The Do-nothing/No-action alternative concept established the baseline from which the action alternatives were developed and compared. The purpose and need for the action alternatives is defined by the findings of the forecasts and facilities requirements analyses. Forecast aviation activity and the factors associated with increased activity (potential for congestion, safety, etc.) are the underlying rationale for making facility improvements. Market factors (demand) effectively determine the level and pace of private investment (i.e. hangar construction) at the airport. Public investment in facilities is driven by safety, capacity and the need to operate the airport on a financially self-sufficient basis.

Based on the factors noted above, the Do-nothing/No-action alternative is inconsistent with the management and development policies of the Port of Skagit County and its long-established commitment to provide a safe and efficient public air transportation facility that is socially, environmentally, and economically sustainable in Skagit County. The Do-nothing/No-action alternative was therefore eliminated from further consideration.

ALTERNATIVE 1 - MAINTAIN EXISTING DEVELOPMENT PATTERN

Alternative 1 continues development of aviation-related facilities along the Runway 10/28 and 4/22 flightlines based on the configuration of existing airside and landside facilities. Developable areas include currently defined lease lots (as depicted on the airport's binding site plan) that are currently vacant or otherwise uncommitted at this time. The placement of new facilities (i.e., hangars) within available lease lots will be based on market demand and the specific needs of individual tenants. Anticipated demand for landside facilities includes a combination of T-hangars, small and large conventional hangars, aviation–related commercial development, and aircraft parking. Development potential of other areas beyond the 10/28 and 4/22 flightlines is not addressed in this option.

10/28 Flightline

Although the developable areas located at each end of the 10/28 flightline are limited by adjacent wetlands, other physical features (roads, runway-taxiway system) and protected airspace and surface areas, they have the ability to accommodate larger commercially-oriented aviation use buildings due their setback to the adjacent runway and parallel taxiway. In contrast, the development areas located along the 4/22 flightline are relatively narrow in depth.

The existing apron and hangar areas located on the 10/28 flightline are maintained in Alternative 1, although some reconfiguration of aircraft parking is anticipated to better accommodate a mix of business aircraft, helicopters and commercial aircraft loading/unloading at the terminal, in addition to light aircraft tiedowns.

New landside development areas are identified west of the flightline, including Lots 53 and 54 (upland areas); it appears that taxiway access to Lot 53 can be provided from Taxiway A without directly impacting adjacent wetland tracts. Based on the configuration of the access road and circle turnaround that serves the lots, Lot 54 would not have direct access to the airside facilities and would be limited to accommodating aviation-related or non-aviation use without aircraft access.

The east end of the 10/28 flightline is identified for future development of larger hangars and commercial-oriented aviation development (Lot 72). The size and configuration of this development area is defined primarily by Higgins-Airport Way and the 750-foot building restriction line that extends from the centerline of Runway 10/28. Buildings directly abutting the BRL would be limited to a maximum roof height (above runway elevation) of 35.7 feet in order to protect the future precision instrument approach capabilities for the runway. Taller building heights may be permitted further from the runway, based on clearance of the 7:1 transitional

surface slope. For example, a building with a roof height of 50 feet above the runway elevation could be accommodated 850 feet from the runway centerline. Detailed facility layouts, including building setbacks and other refinements will be developed based on the evaluation of preliminary development options.

The development footprint within this area is limited by two additional items: a wetland located adjacent to the aircraft holding area at the Runway 28 end and the runway protection zone (RPZ) for Runway 22. A wetland area depicted as "129" on the Skagit WIN Phase III Map is located near the east end of the 10/28 flightline (see Alternative 3). This wetland is located immediately adjacent to the BRL on its southeast side. Based on the location of this wetland, continued expansion of the existing apron (outer portion) is not proposed in Alternative 1 or 2.

The RPZ for Runway 22 limits development of new facilities at the east end of the flightline. Development of buildings or other landside facilities within RPZs is not recommended based on FAA design standards. The landside area depicted in Alternative 1 remains outside the existing Runway 22 RPZ and the wetland area.

4/22 Flightline

Proposed aviation use development along the 4/22 flightline consists of 15 lots with existing or proposed access to Taxiway G. An extension of Taxiway G is depicted to serve lease lots located beyond the west end of Runway 4. Lots 30 and 31 are located immediately west of (outside) the RPZ for Runway 4. The planned airport fuel storage area is located in Lot 16. Lots 9 and 15 are located between the existing air cargo apron (Lot 8) and the new fueling area. These lots could accommodate hangars, although with apron areas on both sides, it may be appropriate to reserve the area for additional (centralized) aircraft parking apron. Lots 17 and 18 are currently under development with a new fixed base operator (FBO) and 10-unit T-hangar. Future vehicle access from Ovenell Road is depicted near the west end of the flightline.

As proposed, the remaining available lease areas appear to have adequate capacity to accommodate forecast growth in based and itinerant aircraft facility needs. Actual capacity limitations would be defined by the type of hangar constructed on each lease lot. For example, there are currently eleven vacant rectangular-shaped lease lots located along the 4/22 flightline that could each accommodate a typical 10 unit T-hangar. In this configuration, these lots could combine to accommodate 110 additional light aircraft. As noted in the facility requirements chapter, the twenty year projection for new hangar space demand is 42 new aircraft (beyond 2005 levels); it appears that even when a 100 percent reserve is added to accommodate potentially higher demand levels, the 4/22 flightline has adequate capacity for this need. However, if each lot accommodated an executive hangar or a single conventional hangar, overall aircraft storage

capacity could be reduced considerably. In order to maximize potential hangar capacity, the majority of the narrow lots located along the flightline should be designated for multiple unit hangars (T-hangars or executive hangars). Other developable areas include several odd-shaped lease lots near the south end of Taxiway F and the west end of the 4/22 flightline. These lots could accommodate a variety of hangar types, including medium and large conventional hangars.

ALTERNATIVE 2 – COMMERCIAL DEVELOPMENT 10/28 FLIGHTLINE

Alternative 2 incorporates redevelopment of existing facility configurations to facilitate the efficient long-term development of landside areas on the airport. In this alternative, the primary development focus within the Runway 10/28 flightline will shift toward accommodating commercial aviation activities that require larger facilities. Development on the Runway 4/22 flightline would focus primarily on general aviation aircraft storage and support. All remaining (currently vacant) lease areas on the 10/28 flightline would be limited to commercial-oriented tenants that require medium to large conventional hangars and associated facilities. Redevelopment of existing facilities on the 10/28 flightline would be consistent with accommodating commercial-related aviation users that generate on-airport employment.

10/28 Flightline

As part of the long-term development strategy, five existing Port-owned T-hangars (buildings A-E) will be relocated to the Runway 4/22 flightline at the end of their useful life. The Port estimates that these hangars will require replacement within the next twenty years. The existing T-hangar area on the 10/28 flightline would be redeveloped to accommodate commercial tenants requiring larger hangars. Reconfiguration of the aircraft parking aprons would also be conducted as part of the redevelopment, with parking maintained for transient/itinerant users.

The primary area available for new development on the 10/28 flightline is located near the east end, adjacent to Higgins-Airport Way. As noted in Alternative 1, the runway protection zone (RPZ) for Runway 22 occupies the eastern half of this area. In Alternative 2, the east end of Runway 4/22 is relocated approximately 200 feet so that the RPZ is shifted to clear the building restriction line. The overall length of Runway 4/22 is reduced to 2,800 feet. Shifting the end of Runway 22 would enable better utilization of the east end of the 10/28 flightline by clearing the RPZ. As noted earlier, the outer portion of this area in line with the existing aircraft apron is not proposed for development due to wetland located along the south side of the BRL (see Alternative 3).

With the 750-foot BRL established for Runway 10/28, a building height of 35.7 feet above the runway can be accommodated without penetrating the 10/28 precision approach transitional

surface; this setback distance will also ensure that no obstruction is created for the shifted Runway 22 visual approach surface (20:1 slope).

It is also noted that if the wetland located near the end of Runway 28 was filled and developed for aircraft apron, the end of Runway 22 could be further relocated (approximately 500 feet from its current location) in order to move the RPZ entirely clear of potential apron expansion. At a length of 2,500 feet Runway 4/22 would accommodate approximately 75 percent of small aircraft weighing less than 12,500 pounds.

The new landside development area west of the flightline (Lots 53 and 54) depicted in Alternative 1 is also included in Alternative 2, with the same development limitations.

4/22 Flightline

In Alternative 2, five Port-owned T-hangars (58 units) would be relocated to the 4/22 flightline. With development of facilities and services intended to serve locally based aircraft on the 4/22 flightline, additional aircraft apron reserves should be also be identified. As noted in Alternative 1, Lots 9 and 15 located between the existing air cargo apron (Lot 8) and the new fueling area could be reserved to provide a centrally located aircraft apron on the 4/22 flightline. Beyond these reserves, there are only eight remaining lots along the 4/22 flightline that would be available for development.

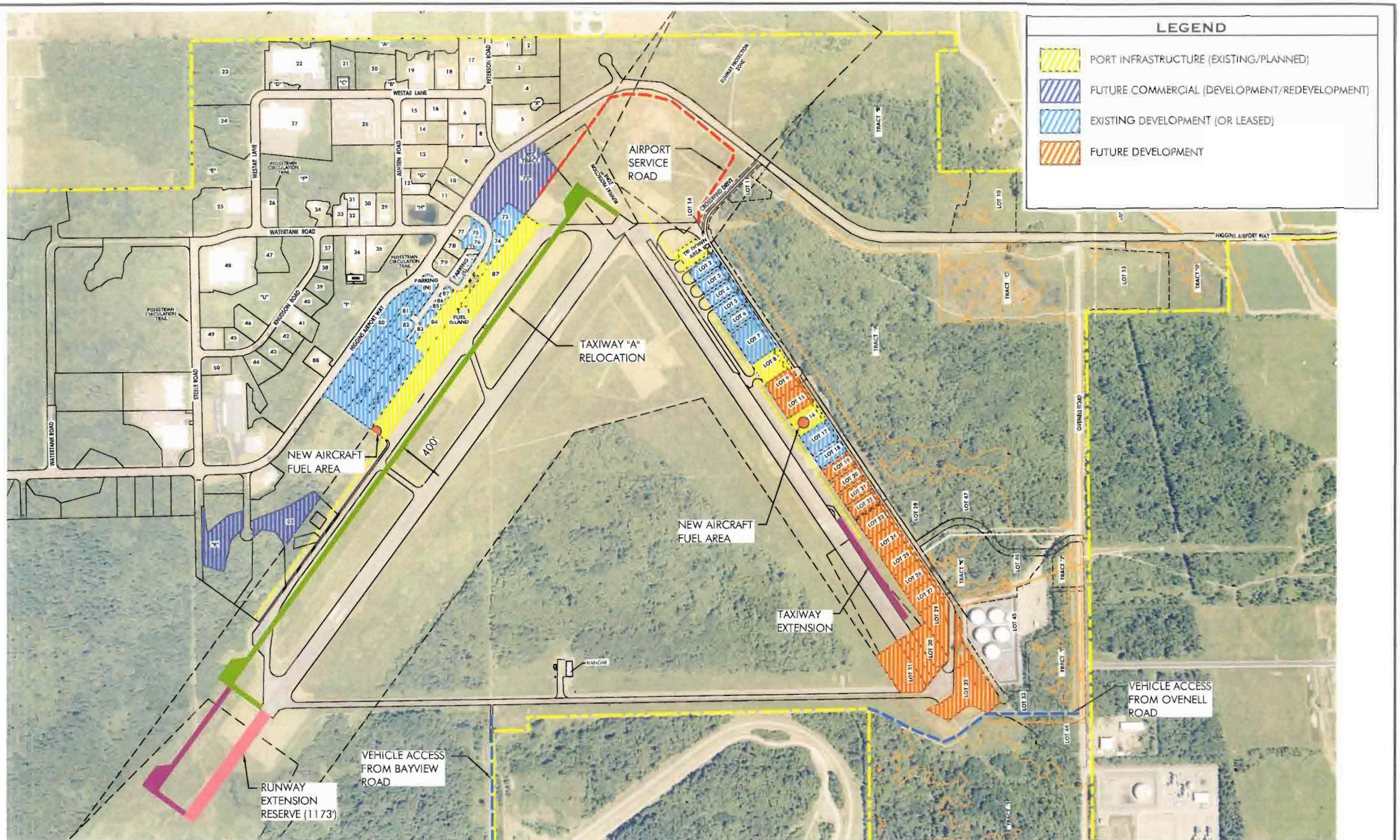
Taxiway F Development Area

Alternative 2 also includes a third landside development area located along the west edge of Taxiway F, opposite the PACCAR facility. Due to the limited depth of developable area, a single row of one-sided hangars would be located between the taxiway and property line. Narrowing Taxiway F to 35 feet and relocating the taxiway centerline (based on ADG II design standards) to the east would provide additional developable area for hangars, access road and vehicle parking. Improvements to Taxiway F would be required to accommodate aircraft access to both runways. The utilities needed to serve this new hangar development area would be extended from the south (near Ovenell Road) to the north. The hangar development area would be phased from south to north to allow site development and other infrastructure costs to be spread out over a longer period as demand for hangar space materializes. Vehicle access to the Taxiway F hangar area is proposed from the south and north ends via Ovenell and Bayview Roads.

ALTERNATIVE 3 - LONG-TERM LAND DEVELOPMENT OPTION

This option considers the potential of developing a limited amount of delineated wetlands that are located adjacent to the Runway 10/28 flightline in conjunction with protecting other wetlands recently delineated in the interior of the airfield. The primary areas of interest include "Tract J," which is located beyond the west end of the 10/28 flightline and the area depicted as "129" on the Skagit WIN Phase III - Wetland Management Plan, which is located near the east end of the 10/28 flightline apron.

The potential development of these particular wetland areas would require agreement between the Port and the U.S Army Corp of Engineers based on prior approval of the Skagit WIN Phase III plan. However, since the wetlands located in the infield portion of the airfield are not included in the WIN Phase III plan, it appears that some modification of the Plan may be appropriate. The areas located beyond the existing development of the 10/28 flightline are significantly limited by wetlands. As part of a long-term wetland management strategy, designating the areas "most suitable" for aviation-related development along the 10/28 flightline and preserving the wetlands in the infield of the airport may be effective both in resource protection and consolidation of development.



N

400 0 400

SCALE: 1"=400'

SOURCE: WALKER AND ASSOCIATES (6-17-04)

PORT OF SKAGIT COUNTY

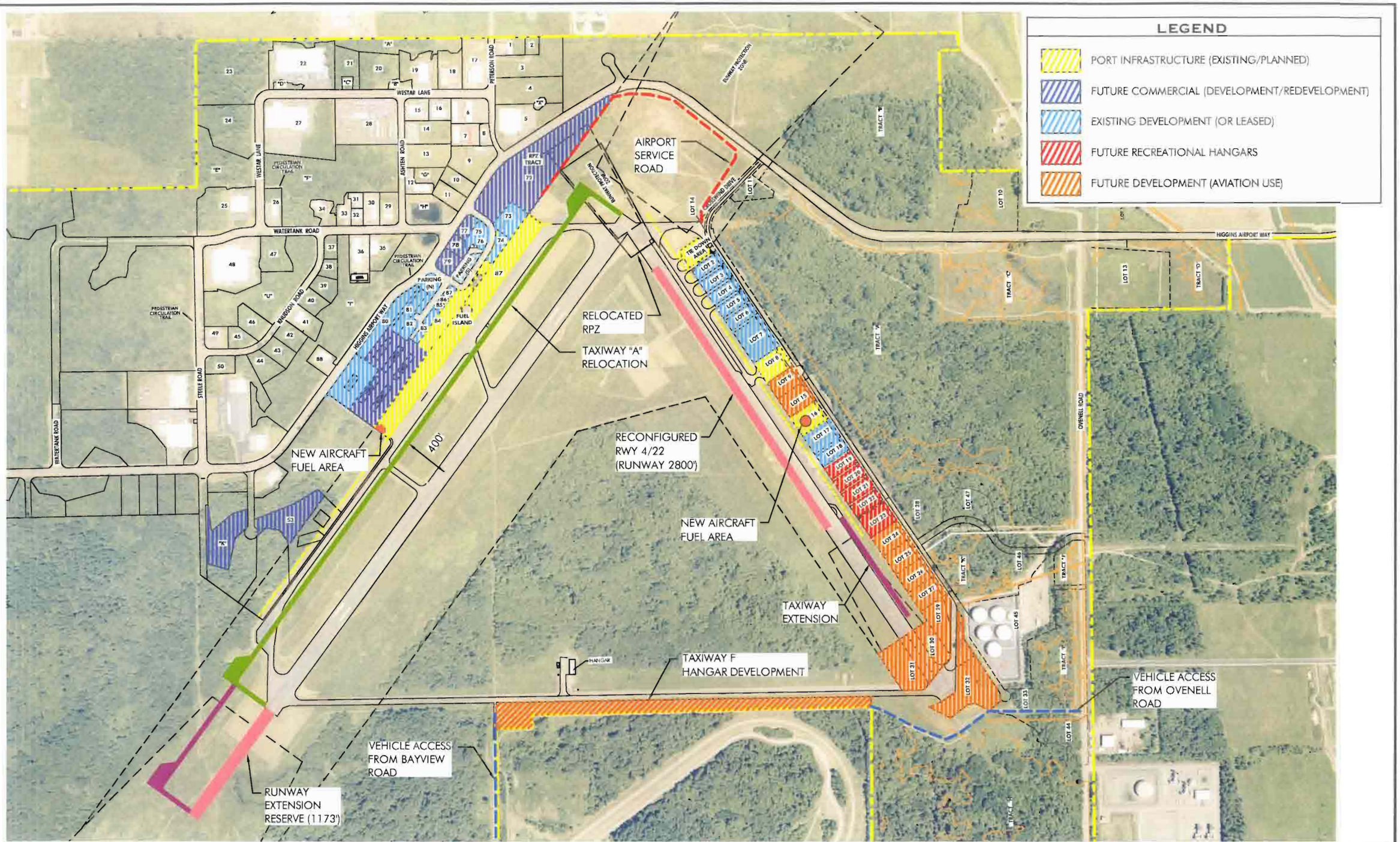
CENTURY WEST ENGINEERING CORPORATION

DAVID EVANS AND ASSOCIATES INC.

ALTERNATIVE I

SKAGIT REGIONAL AIRPORT AIRPORT MASTER PLAN

FIGURE 4-1



SOURCE: WALKER AND ASSOCIATES (6-17-04)

PORT OF SKAGIT COUNTY

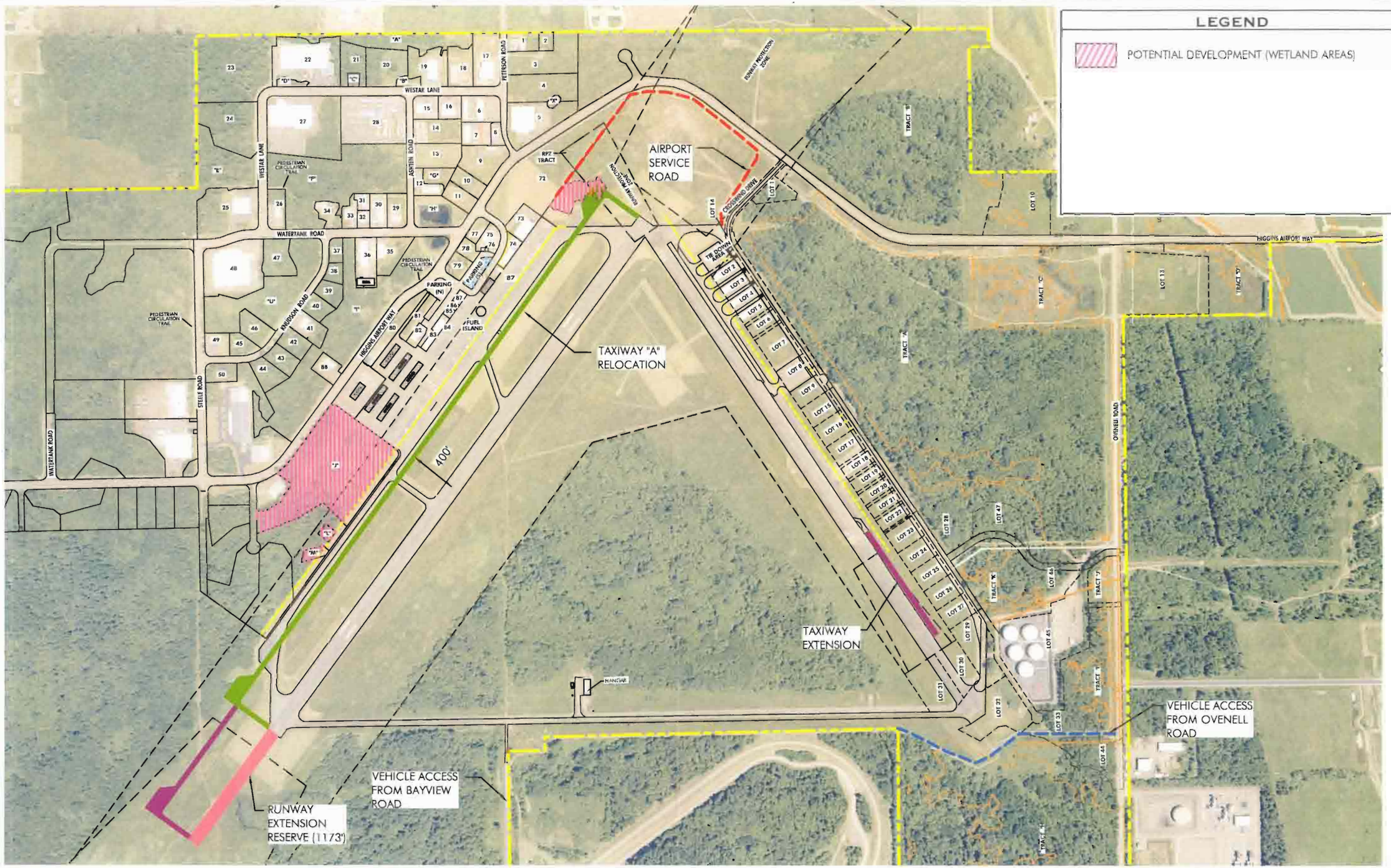
CENTURY WEST ENGINEERING CORPORATION

DAVID EVANS AND ASSOCIATES INC

ALTERNATIVE 2

SKAGIT REGIONAL AIRPORT AIRPORT MASTER PLAN

FIGURE 4-2



SOURCE: WALKER AND ASSOCIATES (6-17-04)

PORT OF SKAGIT COUNTY

CENTURY WEST ENGINEERING CORPORATION

DAVID EVANS AND ASSOCIATES INC.

ALTERNATIVE 3 (LAND DEVELOPMENT OPTIONS)

SKAGIT REGIONAL AIRPORT
AIRPORT MASTER PLAN

FIGURE 4-3

PREFERRED ALTERNATIVE

Based on a review of the preliminary development alternative concepts, combined with input provided by the Master Plan Advisory Committee, the FAA, airport users and tenants, and the general public, the Port has selected a preferred alternative that is largely based on Preliminary Alternative 2, with specific modifications to reflect other desirable elements. **Figure 4-4** illustrates the primary components of the preferred alternative; **Figures 4-5 through 4-7** provide additional detail for three areas:

- Runway 10/28 Flightline
- Runway 28 and 22 Area
- Taxiway F Area

The preferred alternatives figures are intended to represent the recommended development items with a reasonable amount of detail so that the information can then be fully integrated into the airport layout plan (ALP) drawing set. Additional refinement (dimensioning, configurations, etc.) of specific development items is incorporated into the ALP drawings; additional revisions based on formal FAA review and coordination have also been added to the ALP (please see Chapter 7).

Runway 10/28

No changes to Runway 10/28 are proposed in the current 20-year planning period. A 1,173-foot runway extension reserve is recommended at the end of Runway 10 to preserve long-term development options related to increased use of the airport by larger business jets that may occur beyond the current forecast activity.

The future Runway 10/28 west-side parallel taxiway will connect directly with relocated end of Runway 22, with three connections to Runway 10/28. An aircraft holding/run-up area is recommended near the end of Runway 10 and Taxiway F. It is expected that use of Taxiway F to access Runway 10/28 and its parallel taxiways will increase significantly as aircraft-related development activity expands along the Runway 4/22 flightline. *Please see ALP for revised configuration.*

Runway 4/22

As initially presented, Runway 4/22 was to be shifted along its existing centerline to accommodate development within Lot 72, at the east end of the Runway 10/28 flightline. However, through subsequent coordination between the Port and FAA, it was determined that the

existing runway-parallel taxiway separation (150 feet) was not adequate based on the existing use of the taxiway by ADG II aircraft. This issue is described further in the taxiway section (see below), however, the long term solution for this issue will be to shift the centerline of Runway 4/22 approximately 90 feet to meet the ADG II runway-taxiway separation standard of 240 feet.

It was further agreed that due to the unique circumstances involved, the FAA would participate in the cost of relocating/reconstructing Runway 4/22. It is anticipated that the changes to Runway 4/22 will be completed in two phases. Phase I will shift the runway on its current alignment (on original runway pavement) while maintaining its current length of 3,000 feet. A new 3,000-foot runway would be constructed 90 feet north of the current runway (toward the infield) as longer term project (Phase II).

The preferred alternative shifts Runway 4/22 approximately 430 feet to the west to maximize the development potential of aeronautical use landside lease areas located at the east end of the Runway 10/28 flightline. In this configuration, the Runway 22 protection zone (RPZ) is also shifted to the west, clear of the proposed lease lots in the current "Lot 72" area, consistent with FAA development guidelines within RPZs (see **Figure 4-6**). Through its review of the preliminary development alternatives, the FAA requested that runway object free areas be extended beyond each of the airport's RPZs "to the extent practical." Based on the recommended configuration for Runway 4/22, the OFA will extend approximately 500 feet beyond the future Runway 22 RPZ before reaching Higgins-Airport Way (existing/future fencing located along the west side of the road). When combined with the standard B-I (small) OFA that extends 240 feet beyond the runway end, the defined OFA will extend approximately 1,700 feet beyond the future end of Runway 22 (including the area within the RPZ).

The FAA's OFA recommendation also affects the development potential of two previously-defined lots (30 and 31), included in the Port's binding site plan for the airport. These lots were specifically configured based on the FAA RPZ clearance standards that were applied when the runway (then 3/21) was reconfigured and shortened to 3,000 feet. However, with the added requirement of extending the OFA beyond the RPZ, these lots are no longer developable. As originally proposed, the end of Runway 4 was not shifted as part of the changes to the Runway 22 end, in order to preserve the development potential of Lots 30 and 31. However, based on these factors, the Port has opted to preserve the current 3,000-foot length of Runway 4/22 and eliminate Lots 30 and 31 to conform to the FAA's extended OFA requirement (see **Figures 4-4 and 4-7**). The OFZ for Runway 4 will extend approximately 500 feet beyond the RPZ, which is approximately 1,700 feet beyond the future runway end (including the RPZ).

Taxiways

Major taxiway upgrades include the addition of an infield-side parallel taxiway for Runway 10/28; reconfiguration of Taxiway F to accommodate planned hangar construction) and a 2,000-foot extension of Taxiway G to connect to the south end of Taxiway F. The recommended development at the east end of the Runway 10/28 flightline will be served by a taxiway extension from the end of the main apron; access taxiways or taxilanes are also recommended to serve individual hangar lease lots. All recommended taxiway improvements will be based on ADG II design standards.

Note: During review of the draft final airport master plan report, the FAA provided the following comment: "It appears that a second parallel taxiway to Runway 10/28 is not justified at this time and may require future planning studies. Based on this input the taxiway will be identified as a long-term development reserve on the ALP.

As noted previously, the centerline separation between Runway 4/22 and Taxiway G is 150 feet, which does not meet ADG II design standard (240 feet). Since maintaining ADG II aircraft access along the 4/22 flightline is consistent with recent and ongoing landside development, a modification to standards (based on demonstrating acceptable wingtip clearances exist for passing aircraft on the runway and parallel taxiway) is recommended to allow ADG II aircraft to continue using Taxiway G until a longer term project to relocate Runway 4/22 90 feet is completed.

Taxiway F will be narrowed to 35 feet (ADG II) and the centerline shifted approximately 7.5 feet east as part of the development of hangars along the west edge of the area. The hangar lease lots will be configured to be clear of the future ADG II taxiway OFA (minimum 65.5 feet from centerline).

Runway 10/28 Flightline

The preferred alternative includes short-term and long-term development and redevelopment elements for aviation use facilities. The primary short-term improvements include development a new aircraft fueling area at the western end of the apron and reconfigured aircraft tiedowns on the apron.

Three existing rows of tiedowns located near the west end of the apron are oriented perpendicular to the runway-parallel taxiway. The tiedown rows have a total of 24 positions, although 3 positions are located within the taxiway OFA (21 useable positions). These tiedown rows will be reoriented to run parallel to the runway-taxiway. This change will eliminate the existing taxiway OFA conflict and increase the overall capacity in this area to approximately 26 tiedowns. The existing row of four larger aircraft tiedowns and the row of small aircraft tiedowns located

immediately adjacent to the new aircraft fueling area will be reconfigured to provide adequate space for aircraft fueling.

The longer term redevelopment component for the west end of the 10/28 flightline involves relocating five existing T-hangars and the existing Methow hangar and concentrating development of commercially-oriented hangars. The conceptual configuration provides seven hangar lots (H-O approximately 3.75 acres of hangar lease area), one inside corner lot with no aircraft access and areas for vehicle parking. Conceptual building footprints have also been added to the new hangar lease lots. This information is provided for illustration only and is not intended to precisely reflect actual building configurations within the lots. Vehicle access to the redeveloped area would be provided by a new access road and turnaround that connects with Higgins-Airport Way. The redevelopment of this area may be completed in two phases based on the useful life remaining on individual hangar. This would allow a portion of the hangar area to continue in use until demand warranted redevelopment.

ADG II taxilane OFA clearances (115 feet) are depicted through the back section of the main apron. The existing outer row of tail-in aircraft tiedowns is reconfigured to accommodate drive-through parking positions for itinerant fixed wing aircraft and rotorcraft. The east half of the flightline provides several drive-through positions for itinerant corporate aircraft parking and for passenger loading/unloading directly in front of the terminal building. A limited amount of short-term itinerant parking for small aircraft is maintained in the vicinity of the airport restaurant and terminal building.

The primary facility improvements for the east end of the 10/28 flightline are related to the development of large hangar lease lots beyond the east end of the flightline. A taxiway will be extended from the east end of the existing apron to provide access to nine lease lots (A-I), totaling approximately 6.6 acres. As noted earlier, the extended OFA for Runway 28 reduces the developable area, but accommodates taxiway access to individual hangar lease lots. Separate frontage roads will be developed to provide vehicle access on either side of the extended OFA from Higgins-Airport Way. An airport service road is planned around the end of Runway 28, outside both the extended runway safety area and object free area. The service road will connect the 4/22 and 10/28 flightlines and will be used by airport maintenance vehicles, emergency vehicles and fuel trucks.

A future helicopter parking apron is located near the east end of the access taxiway, outside the Runway 28 RPZ. The adjacent lease lots (H and I) would be appropriate to accommodate smaller conventional hangars for tenants requiring helicopter storage.

Runway 4/22 Flightline

The improvements planned for the Runway 4/22 include a combination of T-hangars, conventional hangars and fuel facilities. As proposed in Preliminary Alternative 2, five lease lots in this area will be reserved for the eventual relocation of the five T-hangars currently located on the 10/28 flightline. Lots 30 and 31 located near the west end of the 4/22 flightline will be eliminated based on the new RPZ location for Runway 4 and the requirement to protect the extended OFA for Runway 4. Adding a future vehicle access road connection from Ovenell Road is recommended to serve the western end of the 4/22 flightline. Taxiway G will be extended from the current end of Runway 4 to the south end of Taxiway F.

The planned improvements to Runway 4/22 would be developed in two phases; turf runway shoulder planned for the north side of the runway would need to be replaced in conjunction with the second phase (new runway construction). The planned 90-foot shift of Runway 4/22 will allow the standard Airplane Design Group II (ADG II) to be provided with Taxiway G.

The primary development constraints for the lots located along the Runway 4/22 flightline are defined by the building restriction line, the taxiway object free area, and the existing fencing located at the south edge of each lease lot. A conceptual detail view is provided to illustrate the typical configuration of facilities that could be accommodated within these lease lots.

Taxiway F Hangar Area

The developable area located along the western edge of Taxiway is planned for a single row of conventional or executive hangars. In order to accommodate the hangar row, Taxiway F will be narrowed to 35 feet and shifted east to align on the existing edge of pavement. The ADG II taxiway OFA will define the required building setbacks from the taxiway centerline.

The hangar lot configuration along Taxiway F provides areas to the sides of the hangars for aircraft parking and staging. Due to the limited depth of developable area between the west side of Taxiway F and the adjacent airport property line, the edge of the taxiway object free area coincides with the front edge of the proposed hangars. This configuration will not permit aircraft to be parked directly in front of the hangars (within the taxiway OFA). The modified lot configuration provides parking areas to hangar tenants that are clear of the taxiway OFA. The conceptual layout depicts 15 lots (.43 acres each) that include a portion of the shared staging area located between hangars. Two larger lots are also located at the south end of the taxiway.

Vehicle access to the Taxiway F hangar area would be provided via Ovenell Road, with an optional connection to Bayview Road. The access road would travel behind the hangar row, between the property line and the backs of the buildings. A vehicle access point has been added

within the hangar row to provide convenient access for emergency and service vehicles. It is anticipated that the Taxiway F development will be phased (south to north) based on demand for hangar sites and the cost of extending utilities to serve the area. The precise location and configuration of storm water detention facilities will be considered during design, although it is anticipated that this can be accomplished near the southern end of the development area.

LEGEND

TAXIWAY NEW PAVEMENT

RUNWAY NEW/RECONFIGURED PAVEMENT

PAVEMENT TO BE REMOVED

WETLAND FILL AREA (NOT CURRENTLY AUTHORIZED IN SKAGIT WIN)

LEGEND

FUTURE COMMERCIAL (AERONAUTICAL USE) CARGO,FBO,ETC.

FUTURE RECREATIONAL/EXECUTIVE HANGARS

FUTURE DEVELOPMENT (AERONAUTICAL USE)

AIRPORT SERVICE ROAD

WETLAND

SHIFTED RWY 22 THRESHOLD & RPZ

240'

NEW AIRCRAFT FUEL AREA

35'

RECONFIGURED RWY 4/22 PHASE I

RELOCATED AIRPORT BEACON

RECONFIGURED RWY 4/22 PHASE II

NEW AIRCRAFT FUEL AREA

ULTIMATE RUNWAY (90' SHIFT) CONFIGURATION

AVIATION USE LEASE

RPZ

400'

TAXIWAY F NARROWED & ℄ SHIFTED

TAXIWAY EXTENSION

AVIATION USE RESERVE

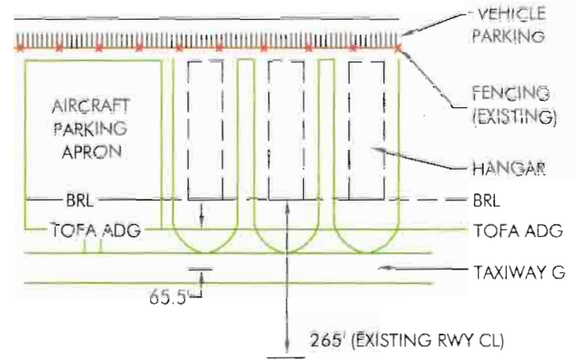
VEHICLE ACCESS FROM BAYVIEW ROAD

TAXIWAY F HANGAR DEVELOPMENT

RUNWAY EXTENSION RESERVE (1173')

VEHICLE ACCESS FROM OVENELL ROAD

VEHICLE ACCESS FROM OVENELL ROAD(OPTIONAL)



CONCEPTUAL HANGAR CONFIGURATION
RWY 4/22 FLIGHT LINE

3/32"=1'-0"

N

400 0 400

SCALE: 1"=400'

SOURCE: WALKER AND ASSOCIATES (6-17-04)

PORT OF SKAGIT COUNTY

CENTURY WEST ENGINEERING CORPORATION

DAVID EVANS AND ASSOCIATES INC

PREFERRED ALTERNATIVE (REVISED 9/05)

SKAGIT REGIONAL AIRPORT AIRPORT MASTER PLAN

FIGURE 4-4

LEGEND

- HANGAR/LEASE LOTS
- CONCEPTUAL BUILDING FOOTPRINTS
- P — PARKING
- ✱ — ITEMS TO BE REMOVED OR RECONFIGURED TO ACCOMMODATE LONG TERM RE-DEVELOPMENT
- TAXIWAY- NEW RECONFIGURED PAVEMENT
- ACCESS ROAD-NEW

APPROXIMATE LOT SIZES
(LOT 72)
"IN ACRES"

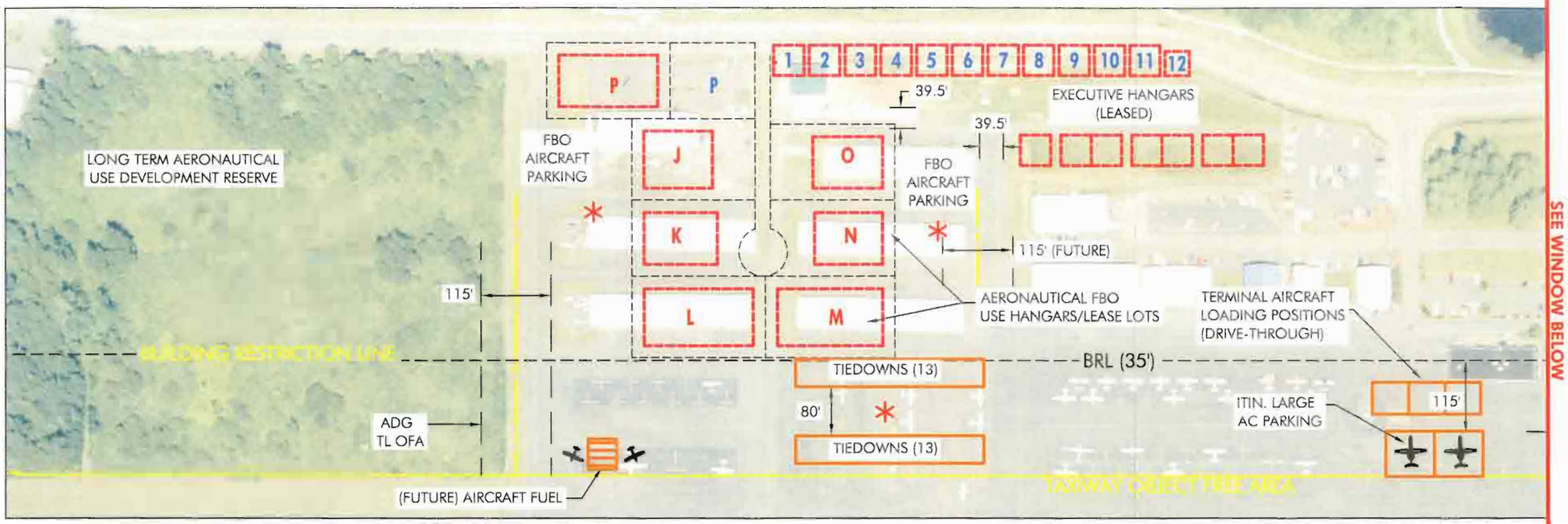
A = 1.33
B = .91
C = .80
D = .98
E = .76
F = .48
G = .29
H = .70
I = .35

TOTAL = 6.60

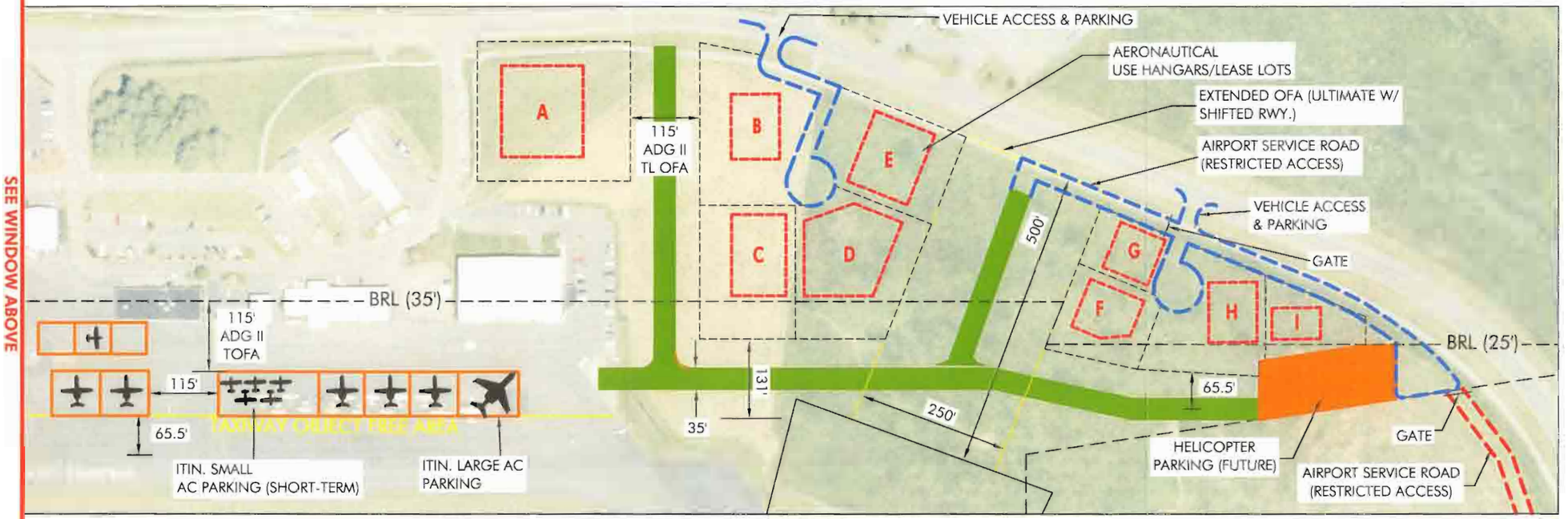
WEST APRON
LEASE LOTS

J = .62
K = .56
L = .67
M = .64
N = .56
O = .77
P = .58

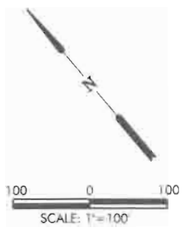
TOTAL = 4.40



WEST END



EAST END



SOURCE: WALKER AND ASSOCIATES (6-17-04)

PORT OF SKAGIT COUNTY

CENTURY WEST ENGINEERING CORPORATION

DAVID EVANS AND ASSOCIATES INC

PREFERRED ALTERNATIVE
RUNWAY 10/28 - FLIGHT LINE AREA (REVISED 9/05)

SKAGIT REGIONAL AIRPORT
AIRPORT MASTER PLAN

FIGURE 4-5

LEGEND

TAXIWAY NEW PAVEMENT

RUNWAY NEW/RECONFIGURED PAVEMENT

PAVEMENT TO BE REMOVED

WETLAND FILL AREA (NOT CURRENTLY AUTHORIZED IN SKAGIT WIN)

CONCEPTUAL BUILDING FOOTPRINT

APPROXIMATE LOT SIZES (LOT 72) "IN ACRES"

A = 1.33
B = .91
C = .80
D = .98
E = .76
F = .48
G = .29
H = .70
I = .35

TOTAL = 6.60

150 0 150
SCALE: 1"=150'

SOURCE: WALKER AND ASSOCIATES (6-17-04)

RSA (F)
VEHICLE GATE
BRL (24')
HANGAR ACCESS ROAD
HELICOPTER PARKING (FUTURE)
AIRPORT SERVICE ROAD
CROSSWIND DRIVE
LOT 1
TIEDOWN APRON
LOT 2
LOT 3
LOT 4
LOT 5
LOT 6
AIR CARGO BLDG. LEASE
AIR CARGO APRON
AIRCRAFT HOLD AREA
RELOCATED RPZ (ULTIMATE)
VEHICLE GATE
EXTENDED OFA
BRL
TOFA ADG II
LOT 7
LOT 8
LOT 9
TAXIWAY G
355'
265'
65.5'
240'
35'
RECONFIGURED TXY B EXIT
AIRPORT SERVICE ROAD (RESTRICTED ACCESS)
PETERSON ROAD
22
22
TURF SHOULDER (PHASE I)
RSA PHASE II
TURF SHOULDER (PHASE II)
ABANDON PAVEMENT (PHASE I)
RSA PHASE I
RELOCATE RUNWAY 22 END (PHASE I)
AC HOLD LINE (PHASE I)
SHIFTED RUNWAY CL (90') (PHASE II)
AC HOLD LINE (PHASE II)
131'
BRL (35')
35'
RELOCATE AIRPORT BEACON
RVZ
400'
DRIVE

PORT OF SKAGIT COUNTY
CENTURY WEST ENGINEERING CORPORATION
DAVID EVANS AND ASSOCIATES INC

PREFERRED ALTERNATIVE
RUNWAY 28 AND 22 AREA (REVISED 9/05)

SKAGIT REGIONAL AIRPORT
AIRPORT MASTER PLAN

FIGURE
4-6

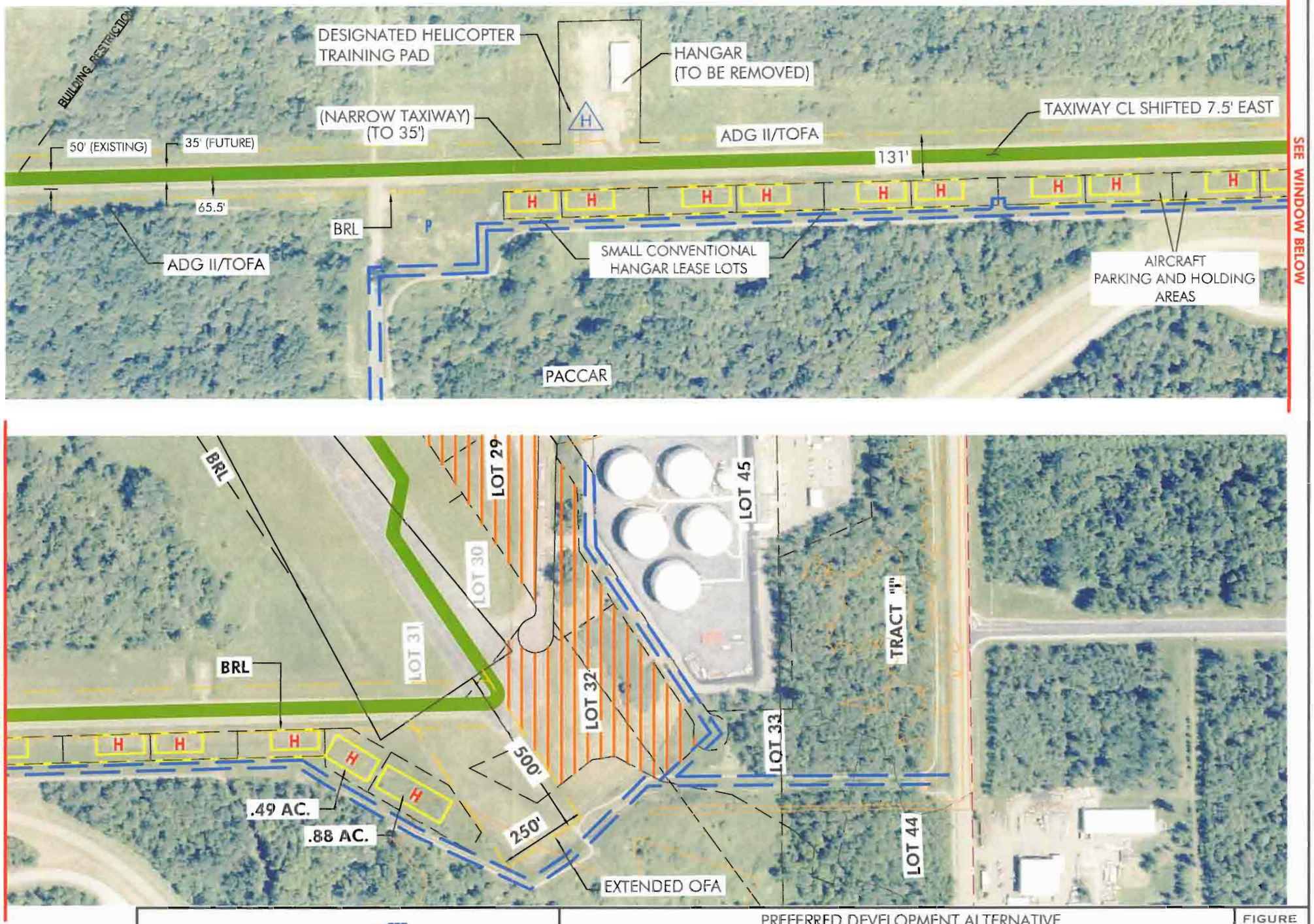
LEGEND

- H — HANGARS
- P — PARKING
- APPROXIMATE BUILDING FOOTPRINT
- TAXIWAY- NEW RECONFIGURED PAVEMENT
- ACCESS ROAD-NEW

TAXIWAY F HANGAR LOT SIZE
TYPICAL = .43 ACRES

NOTE:

1. LOT 30,31 TO BE ELIMINATED
2. NO AIRCRAFT PARKING WILL BE ALLOWED DIRECTLY IN FROUNT OF HANGARS.
3. AIRCRAFT PARKING AND HOLDING AREAS TO BE LOCATED BETWEEN HANGARS OUTSIDE TAXIWAY OFA.



N

140 0 140

SCALE: 1"=140'

SOURCE: WALKER AND ASSOCIATES (6-17-04)

PORT OF SKAGIT COUNTY

CENTURY WEST ENGINEERING CORPORATION

DAVID EVANS AND ASSOCIATES INC

PREFERRED DEVELOPMENT ALTERNATIVE
TAXIWAY F AREA (REVISED 8/05)

SKAGIT REGIONAL AIRPORT
AIRPORT MASTER PLAN

FIGURE 4-7

Skagit Regional Airport
Airport Master Plan Update

Chapter Five

Environmental Review

CHAPTER FIVE
ENVIRONMENTAL REVIEW

OVERVIEW

The purpose of this chapter is to document the analysis of potential environmental impacts related to the Skagit Regional Airport Master Plan update. It summarizes the information and analysis that was used to complete an Environmental Checklist for a non-project action. This checklist is intended to be sufficient to satisfy National Environmental Policy Act (NEPA) and State Environmental Policy Act (SEPA) requirements for master plan proposed airport projects/activities that would likely qualify for a Categorical Exemption under NEPA, a Mitigated Determination of Non-Significance (MDNS) or Determination of Non-Significance (DNS) under SEPA. A copy of the completed SEPA checklist is provided in **Appendix F**.

The Environmental Checklist is intended to identify any physical, social, or environmental conditions of record that may affect the ability to undertake future improvements proposed by the master plan update for Skagit Regional Airport (BVS). All research activities, including correspondence, data collection and documentation proceeded under the provisions of FAA Order 50.50.4A, The Airport Environmental Handbook, which is intended to implement the requirements of Sections 1505.1 and 1507.3 of NEPA. Specific impact categories that do not apply to this study site are noted accordingly.

Specific areas of analysis included: land use; noise; socio-economics; air quality; water quality and drainage; transportation; Department of Transportation Section 4(f) potential impacts on parks, recreation, open space and historical/cultural sites; historic, archaeological, and cultural resources; biotic communities and endangered species; wetlands, floodplains, and coastal zone management areas; and prime and unique farmlands.

Preferred Alternative Considerations

The facility development associated with the preferred alternative is largely contained within existing developed areas of the airport. Limited areas of wetland impacts may occur near the east end of the Runway 10/28 flightline and the near the end of Runway 22. The precise nature of

these and other potential impacts will need to be evaluated during the project-specific environmental review required for all FAA funded projects. The most environmentally sensitive areas of the airfield have been avoided by consolidating planned development within existing developed areas to the greatest extent possible.

LAND USE

Site and Vicinity Land Use

The airport is located entirely within the Bayview Ridge Subarea (Subarea) a 4,011-acre area located on a topographic bench above the Skagit River floodplain. The Subarea includes 3,633 acres located within the Bayview Ridge Urban Growth Area (UGA) and an additional 378 acres located in urban and rural reserve tracts at the fringe of the UGA. The Subarea is surrounded by agricultural lands, pastureland, and scattered rural residential housing. Within the Subarea, land uses consist of the airport and related facilities, industrial/business development, pastureland, and residential housing. The airport is part of approximately 1,836 acres of land owned by the Port within the Subarea. The airfield portion includes approximately 783 acres; 1,056 (+-) acres of adjoining Port land is used for the Bayview Business and Industrial Park. 108 acres of this land are currently developed with industrial operations and businesses. The airport area consists of two runways, taxiways, apron areas, a terminal building, parking and entrance roads, support facilities, air cargo operations, and aircraft storage facilities. The site contains 28 existing buildings. These include a terminal building, maintenance building, restrooms, fuel station, equipment garage, commercial building, aerospace manufacturing building, civil air patrol office and numerous conventional hangar/office and T-hangar buildings. **Table 1-20** in **Existing Conditions Inventory Chapter 1** provides a summary of existing land uses in the Subarea.

Currently industrial facilities are located within the Bayview Business and Industrial Park and private industrial land east of the airport. The Skagit County Solid Waste Transfer Station is located southwest of the airport. The Paccar Technical Center is located directly west of the airport and adjoins the Port's property. The Olympic Pipeline Tank Farm is located on the Port's property, directly south of Runway 4-22.

Areas east of the airport and Bayview Business and Industrial Park support industrial development, the Skagit Golf and Country Club, and surrounding residential development with urban levels of density. Areas north and west of the airport support scattered rural residences and pastureland. Agricultural lands are located southeast of the airport along Highway 20, outside of the UGA boundaries.

Comprehensive Plan and Zoning Designations

Skagit County's existing comprehensive plan and zoning designations for the Port's property consist of Aviation Related Uses (AVR), Bayview Ridge Industrial (BR-I), and Bayview Ridge Heavy Industrial (BR-HI). The AVR plan/zoning designation applies to the airport portion of the site. This zoning district permits regional airfields and uses accessory or related to aviation as outright permitted uses. Most of the surrounding Bayview Ridge area outside of the UGA has a plan designation/zoning of Rural Reserve (RRV) or Rural Intermediate (RI). The airport also qualifies as an "Essential Public Facility" under the provisions of the state Growth Management Act (GMA). Other rural lands close to the airport have a plan/zoning designation of Rural Resource (RRc-NRL) and Agriculture (Ag-NRL). Most of the surrounding Subarea is also located within an Airport Environs Overlay (AEO) zoning district. The AEO zone is intended to ensure the development of compatible land uses in the area surrounding the airport. This overlay zone prohibits certain land uses such as hospitals, manufactured home parks and ground storage of flammable or hazardous materials.

Skagit County has recently adopted a Bayview Ridge Subarea Plan to facilitate the growth of a cohesive urban community in the area, including business/industrial facilities and moderate-density residential development that is also compatible with airport operations. The County has allocated 750 acres of new commercial/industrial land to the Subarea by 2015. A portion of this allocation will be met within the Port's Bayview Business and Industrial Park. The adopted Subarea Plan retained existing land use designations and established the Bayview Ridge Light Industrial (BR-LI) designation where the BR-I zone previously existed. **Figure 1-6** in **Chapter 1** depicts the Plan's land use designations.

The Subarea Plan was adopted in December 2006 and establishes the following use designations within and surrounding the airport: Bayview Ridge Residential (BR-R), Bayview Ridge Community Center (BR-CC), Bayview Ridge Industrial (BR-I), and Aviation Related (AVR). **Table 1-22** in **Chapter 1** outlines these land use designations and the estimated land available in each use area. The Subarea Plan is intended to provide additional land use compatibility for BVS in order to satisfy state of Washington Growth Management Act (GMA) planning requirements. Please refer to the Land Use Compatibility subsection of this portion of the Chapter for additional information.

Shoreline Master Program Designation

A review of Skagit County's Shoreline Management Master Program has confirmed that no portion of the Port's airport property or immediately adjoining land contains any water body that is under the jurisdiction of the state of Washington Shoreline Management Act.

Environmentally Sensitive Area Designation

Approximately 279 acres of wetlands have been delineated and characterized within the Port's property under the Skagit WIN (Wetlands and Industry Negotiations) process. This process was initiated in 1994 to identify and characterize all wetlands on the Port's property and develop a multi-agency agreement that allows development of the property while protecting wetlands to the maximum extent feasible. Also see the Wetland, Floodplains, and Coastal Zone Management Zone section of this chapter for additional information.

Projected Employment Increases

74 people currently work full-time and part-time at airport related facilities. A detailed estimate of the number of people that would eventually work in the additional proposed facilities has not been made. However, the total number of people working at the airport could potentially be more than double the current level when all of these improvements are completed. No people currently reside on the site and no future residential use is proposed.

Land Use Compatibility

In 1996 the Washington State Legislature amended the GMA to assist in preserving the inherent social and economic benefits of aviation. RCW 36.70.547 and 36.70A.510 were added to the GMA to require every local government having a general aviation airport in its jurisdiction to discourage the siting of land uses that are incompatible with the airport. The policy to protect airport facilities must be implemented in the comprehensive plan and development regulations as they are amended in the normal course of land use proceedings. Formal consultation with the aviation community is required.

In addition, the GMA also contains provisions (RCW 36.70A.200) recognizing general aviation airports as Essential Public Facilities and local jurisdictions are required to plan accordingly to

protect these facilities. According to state Growth Management Hearings Board rulings, airport expansion or providing necessary support activities for its expansion is also covered under these provisions.

To assist Skagit County in implementing these GMA planning requirements, a land use compatibility study was prepared for the Skagit Regional Airport in May 2000, *Skagit Regional Airport Land Use Compatibility Study*, by Reid Middleton. The study recommended the establishment of six safety zones. The zones are intended to minimize risks associated with potential accidents near the airport by: (1) limiting residential development and human activity intensity near the airport; (2) providing sufficient open space near the airport to allow successful emergency aircraft landing; and (3) restricting land uses near the airport that would have occupants with limited mobility. **Table 1-21** in **Chapter 1** summarizes the recommended land uses and densities for these zones. Use of Skagit County's AEO zone to implement these safety zones will significantly contribute to long-term maintenance of land use compatibility around the airport. This airport master plan update will provide additional information to assist Skagit County in reviewing its comprehensive plan and zoning provisions to determine if any future revisions will be needed to maintain the maximum feasible level of surrounding land use compatibility with BVS and its operational requirements.

As documented in Facility Requirements Chapter 3, a 1999 National Ocean Surface (NOS) Airport Obstruction Chart (OC) for BVS identified large areas of trees/terrain that penetrate various airspace surfaces. However, no human-made height hazards as defined by the FAA's *14 CFR Part 77 Objects Affecting Navigable Airspace* exist within the defined operational airspace for BVS. The provisions of the County's AEO zoning on land surrounding the airport are intended to prevent the introduction of such potential human-made height hazards along with potential safety hazards.

The projected aircraft operations noise impacts that would be generated by activities and facilities proposed in the airport master plan update are not anticipated to create any significant adverse impacts (above the 65 DNL threshold), on land uses located outside of the Port's airport property. This will also significantly contribute to maintaining long-term land use compatibility around the airport. Please refer to the Noise Analysis section of this chapter for additional information.

The master plan's proposed projects/activities also do not include new roadway improvements or generate increased traffic volumes that would create any significant adverse impacts on nearby existing or planned land uses.

In addition, with the implementation of four "Development Mitigation Measures" included in the Subarea Plan, proposed growth surrounding Skagit Regional Airport should not have significant

adverse impacts on the airport's existing and future operations. The Development Mitigation Measures are as set forth hereafter:

a. The use of avigation easements.

b. Publication, recordation, and incorporation of WSDOT overlay zone and FAA noise contour maps.

c. Notices disclosing and acknowledging airport operations and aircraft overflights and the effects thereof signed by development permit applicants ("Notices").

d. The Port has asserted prescriptive rights to an avigation easement and the Port's continuing assertion of prescriptive avigation easements upon and over properties within the Skagit County UDC Airport Environs Overlay zone (Skagit County Code Section 14.16.210).

NOISE ANALYSIS

Airport Noise and Noise Modeling

As the Washington State Department of Transportation's (WSDOT) Aviation Division's *Airports and Compatible Land Use Handbook* notes "Noise is the most common negative impact associated with airports." The most simplistic definition of noise is unwanted sound. However, sound is measurable, whereas noise is subjective. The relationship between measurable sound and human irritation is the key to understanding aircraft noise impact. A rating scale has been devised to relate sound to the sensitivity of the human ear. The A-weighted decibel scale (dBA) is measured on a "log" scale, by which is meant that for each increase in sound energy level by a factor of 10, there is a designated increase of 1 dBA. This system of measurement is used because the human ear functions over such an enormous range of sound energy impacts. At a psychological level, there is a rule of thumb that the human ear often "hears" an increase of 10 decibels as equivalent to a "doubling" of sound.

The challenge to evaluating noise impact lies in determining what amount and what kind of sound constitutes noise. The vast majority of people exposed to aircraft noise are not in danger of direct physical harm. However, much research on the effects of noise has led to several generally accepted conclusions:

- The effects of sound are cumulative; therefore, the duration of exposure must be included in any evaluation of noise;

- Noise can interfere with outdoor activities and other communication;

- Noise can disturb sleep, TV/radio listening, and relaxation; and
- When community noise levels have reached sufficient intensity, community wide objection to the noise will likely occur.

Research has also found that individual responses to noise are difficult to predict.[39] Some people are annoyed by perceptible noise events, while others show little concern over the most disruptive events. However, it is possible to predict the responses of large groups of people – i.e. communities. Consequently, community response, not individual response, has emerged as the prime index of aircraft noise measurement.

On the basis of the findings described above, a methodology has been devised to relate measurable sound from a variety of sources to community response. For aviation noise analysis, the FAA has determined that the cumulative noise energy exposure of individuals to noise resulting from aviation activities must be established in terms of yearly day/night average sound level (DNL) as FAA's primary metric. The DNL methodology is used in conjunction with the standard A-weighted decibel scale (dBA) which is measured on a "log" scale, by which is meant that for each increase in sound energy level by a factor of 10, there is a designated increase of 1 dBA. DNL has been adopted by the U. S. Environmental Protection Agency (EPA), the Department of Housing and Urban Development (HUD), and the Federal Aviation Administration (FAA) for use in evaluating noise impacts. In a general sense, it is the yearly average of aircraft-created noise for a specific location (i.e., runway), but includes a calculation penalty for each night flight.

The FAA has determined that a significant noise impact would occur if analysis shows that the proposed action will cause noise sensitive areas to experience an increase in noise of DNL 1.5 dB or more at or above DNL 65 dB noise exposure when compared to the no action alternative for the same time frame. As an example, an increase from 63.5 dB to 65 dB is considered a significant impact. The DNL methodology also includes a significant calculation penalty for each night flight. DNL levels are normally depicted as contours. These contours are generated from noise measurements processed by a FAA-approved computer noise model. They are superimposed on a map of the airport and its surrounding area. This map of noise contour levels is used to predict community response to the noise generated from aircraft using that airport.

The basic unit in the computation of DNL is the sound exposure level (SEL). An SEL is computed by mathematically summing the dBA level for each second during which a noise event occurs.

[39] Beranek, Leo, *Noise and Vibration Control*, McGraw-Hill, 1971, pages ix-x.

For example, the noise level of an aircraft might be recorded as it approaches, passes overhead, and then departs. The recorded noise level of each second of the noise event is then added logarithmically to compute the SEL. To provide a penalty for nighttime flights (considered to be between 10 PM and 7 AM), 10 dBA is added to each nighttime dBA measurement, second by second. Due to the mathematics of logarithms, this calculation penalty is equivalent to 10-day flights for each night flight.[40]

A DNL level is approximately equal to the average dBA level during a 24-hour period with a weighing for nighttime noise events. The main advantage of DNL is that it provides a common measure for a variety of different noise environments. The same DNL level can describe an area with very few high noise events as well as an area with many low-level events.

Noise Modeling and Contour Criteria

DNL levels are typically depicted as contours. Contours are an interpolation of noise levels drawn to connect all points of a constant level, which are derived from information processed by the FAA-approved computer noise model. They appear similar to topographical contours and are superimposed on a map of the airport and its surrounding area. It is this map of noise levels drawn about an airport, which is used to predict community response to the noise from aircraft using that airport. DNL mapping is best used for comparative purposes, rather than for providing absolute values. That is, valid comparisons can be made between scenarios as long as consistent assumptions and basic data are used for all calculations. It should be noted that a line drawn on a map by a computer does not imply that a particular noise condition exists on one side of the line and not on the other. These calculations can only be used for comparing average noise impacts, not precisely defining them relative to a specific location at a specific time.

Residential development within the 65 DNL and higher noise contour is not recommended and should be discouraged. Care should be taken by local land use authorities to avoid creating

---

[40] Where Leq ("Equivalent Sound Level") is the same measure as DNL without the night penalty incorporated, this can be shown through the mathematical relationship of:

$$Leq_d = 10 \log \left(\frac{N_d \times 10^{(SEL/10)}}{86{,}400} \right)$$

If SEL equals the same measured sound exposure level for each computation, and if N_d = 10 daytime flights, and N_n = 1 night-time flight, then use of a calculator shows that for any SEL value inserted, $Leq_d = Leq_n$.

potential long-term land use incompatibilities in the vicinity of the airport by permitting development of incompatible land uses such as residential subdivisions within areas of moderate or higher noise exposure. Under federal guidelines, all land uses, including residential, are considered compatible with noise exposure levels of 65DNL and lower.

Noise and Land-Use Compatibility Criteria

Federal regulatory agencies of government have adopted standards and suggested guidelines relating DNL to compatible land uses. Most of the noise and land-use compatibility guidelines strongly support the concept that significant annoyance from aircraft noise levels does not occur outside a 65 DNL noise contour. Federal agencies supporting this concept include the Environmental Protection Agency, Department of Housing and Urban Development, and the Federal Aviation Administration.

Part 150, Airport Noise Compatibility Planning, of the Federal Aviation Regulations, provides guidance for land-use compatibility around airports. **Table 5-1** contains these guidelines. Compatibility or non-compatibility of land use is determined by comparing the noise contours with existing and potential land uses. All types of land uses are compatible in areas below 65 DNL. Generally, residential and some public uses are not compatible within the 65-70 DNL, and above. As noted in this table, some degree of noise level reduction (NLR) from outdoor to indoor environments may be required for specific land uses located within higher-level noise contours. Land uses such as commercial, manufacturing, some recreational uses, and agriculture are compatible within 65-70 DNL contours.

Planning Period Noise Contours

A noise analysis of the effects of existing aircraft operations and proposed projects/activities linked to the updated airport master plan has been performed using the FAA's **Integrated Noise Model (INM), version 6.1.** Noise contours and associated information have been developed to assess current and future aircraft noise exposure and assist in the development of the airport land use compatibility plan.

For planning purposes, the updated noise contours utilized the same definitions of flight tracks (a total of 37 arrival, departure and touch and go tracks) used in the previous INM run (1995 master plan update). The current runway configuration was used for the 2004 noise contours and the runway configuration included in the preferred alternative was used for the future year noise contours.

Based on updated runway utilization estimates provided by airport management, current and forecast activity levels (described in Working Paper No. 3 Forecasts of Aviation Activity) were assigned to the individual flight tracks defined in the INM. Existing, five-year, and 20-year noise contours have been developed and are depicted in **Figures 5-1, 5-2** and **5-3** at the end of this section. The INM data output run for each set of contours is provided in **Appendix G**. The contours are plotted in 5 DNL increments from 55 DNL to 75 DNL, which is consistent with local noise and land use compatibility planning. As noted earlier in this section, under federal standards, all land uses are considered compatible with noise exposure below 65 DNL and the FAA does not formally recognize noise levels below 65DNL in its land use planning.

The majority of current and forecast 55 DNL contours are contained within the airport boundary, although a small area of the current and forecast 55 DNL contour extends southeast of the airport, just beyond the runway protection zone (RPZ) for Runway 28. **All current and forecast 65 DNL and higher noise contours are contained entirely on airport property. Existing local land use designations are also depicted on the noise contour figures; the areas located in the vicinity of the 65 DNL and higher noise contours are designated for airport-related or industrial land use.**

It is interesting to compare the updated noise contours with the contours prepared during the 1995 airport master plan update. In general, the size and shape of both sets of contours are relatively similar and reflect the airport's use by predominantly small aircraft. However, the 1995 master plan forecast annual aircraft operations to range from 55,230 to 108,700 during the twenty-year planning period. The 2005 master plan forecasts are more modest, with annual operations ranging from 57,400 (2004) to 81,462 (2025). The reduction in forecast activity results in fewer noise-generating events, which reduces the size of noise contours. Some minor changes in aircraft fleet mix, including a slight increase in business aircraft operations affect the contours but do not significantly alter the previously defined pattern of noise exposure.

2004 Noise Contours

The 2004 55 DNL noise contour extends several hundred feet on either side of Runway 10/28; approximately 2,900 feet beyond the northwest end of Runway 10/28 (within airport property); and approximately 3,050 feet beyond the southeast end of Runway 10/28 (extends just beyond airport property). The 55 DNL noise contour associated with Runway 4/22 extends approximately 200 to 400 feet along the sides of the runway and less than 100 feet beyond the end of Runway 4; the contour merges with the 55 DNL contour of Runway 10/28 near the midpoint of Runway 4/22 and is contained within airport property.

The 2004 60 DNL noise contour extends 700 to 800 feet beyond the ends of Runway 10/28 and less than 100 feet beyond the end of Runway 4. The 60 DNL contours for Runways 4/22 and 10/28 merge near the end of Runway 22. The combined 60 DNL noise contour for both runways remain entirely on airport property.

The 2004 65 DNL noise contour extends 300 feet or less beyond the both ends of Runway 10/28 and less than 150 feet beyond the end of Runway 4. The combined 65 DNL noise contours for both runways also remain entirely on airport property.

Small, discontinuous areas of 2004 70 and 75 DNL noise contours extend 100 to 200 feet beyond both ends of Runway 10/28. Both the 70 and 75 DNL noise contours are concentrated at the ends of Runway 10/28, and remain in close proximity to the runway entirely on airport property.

2010 Noise Contours

As noted above, the 2010 noise contours were developed based on runway configuration reflected in the preferred alternative. Runway 4/22 is shifted approximately 660 feet to the west and its current length of 3,000 feet is maintained. This change in runway configuration does not appear to significantly alter noise exposure beyond airport property over existing conditions.

The 2010 55 DNL noise contour extends several hundred feet on either side of Runway 10/28; approximately 3,000 feet beyond the northwest end of Runway 10/28 (within airport property); and approximately 3,100 feet beyond the southeast end of Runway 10/28 (extends just beyond airport property). The 55 DNL noise contour associated with Runway 4/22 extends approximately 200 to 400 feet along the sides of the runway and approximately 100 feet beyond the end of Runway 4; the contour merges with the 55 DNL contour of Runway 10/28 near the midpoint of Runway 4/22 and is contained within airport property.

The 2010 60 DNL noise contour extends 1,000 feet beyond the ends of Runway 10/28 and approximately 100 feet beyond the end of Runway 4. The 60 DNL contours for Runways 4/22 and 10/28 merge near the end of Runway 22. The combined 60 DNL noise contour for both runways remain entirely on airport property.

The 2010 65 DNL noise contours extend approximately 250 to 350 feet beyond the ends of Runway 10/28 and within 100 feet beyond the ends of Runway 4/22. The combined 65 DNL noise contours for both runways remain entirely on airport property.

Small, discontinuous areas of the 2010 70 and 75 DNL noise contours extend 150 to 200 feet beyond both ends of Runway 10/28. Both the 70 and 75 DNL noise contours are concentrated at

the ends of Runway 10/28, and remain in close proximity to the runway entirely on airport property.

2025 Noise Contours

The 2025 55 DNL noise contour extend approximately 1,500 to 1,700 feet on either side of Runway 10/28; approximately 3,400 feet beyond the northwest end of Runway 10/28 (within airport property); and approximately 3,500 feet beyond the southeast end of Runway 10/28 (extends just beyond airport property). The 55 DNL noise contour associated with Runway 4/22 extends approximately 400 feet along the sides of the runway and approximately 600 feet beyond the end of Runway 4; the contour merges with the 55 DNL contour of Runway 10/28 near the midpoint of Runway 4/22 and is contained within airport property.

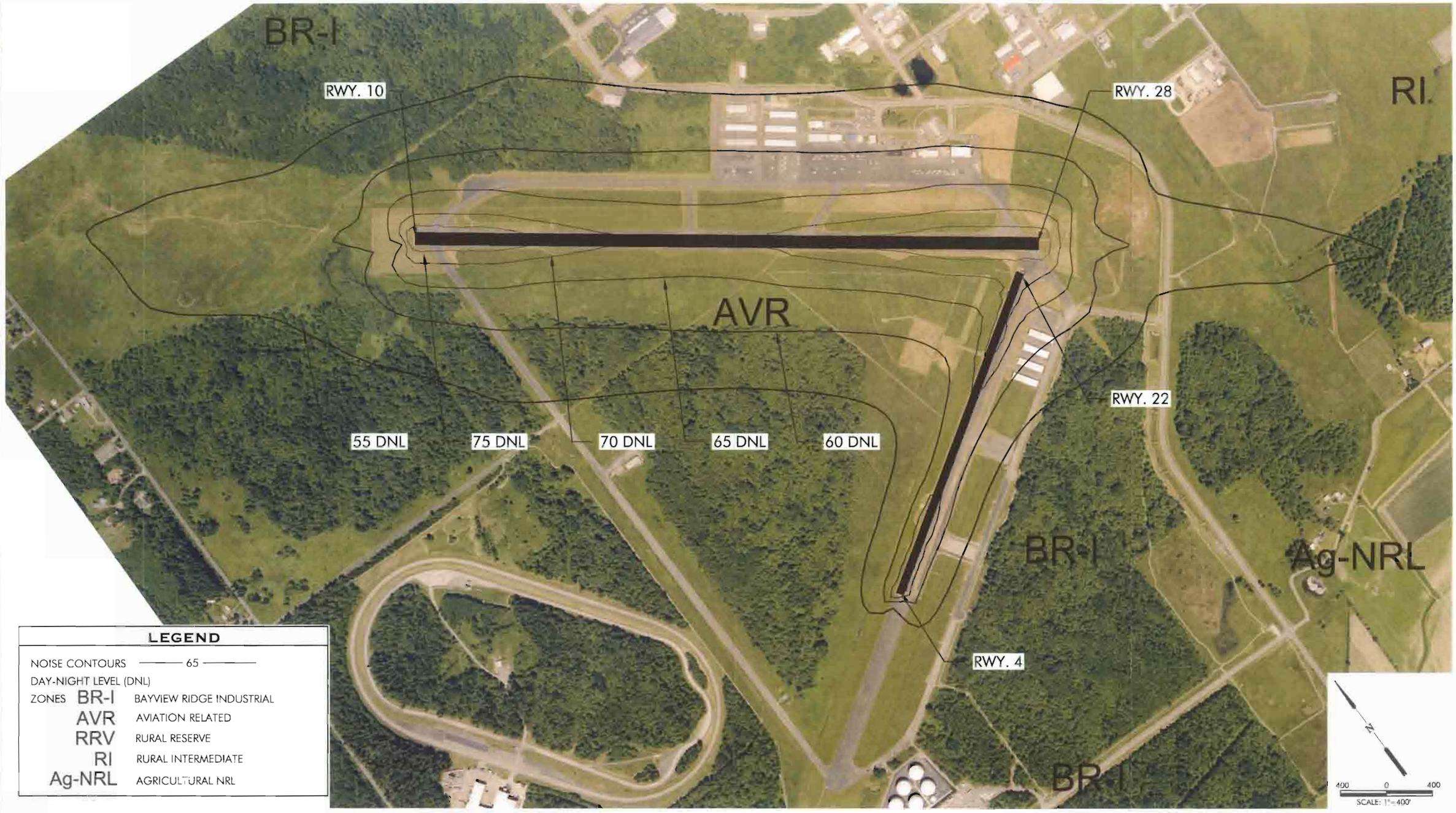
The 2025 60 DNL noise contour extends 1,500 feet beyond the ends of Runway 10/28 and approximately 150 feet beyond the end of Runway 4. The 60 DNL contours for Runways 4/22 and 10/28 merge near the end of Runway 22. The combined 60 DNL noise contour for both runways remain entirely on airport property.

The 2025 65 DNL noise contours extend approximately 300 to 350 feet beyond the ends of Runway 10/28 and within 100 feet beyond the ends of Runway 4/22. The combined 65 DNL noise contours for both runways remain entirely on airport property.

Discontinuous areas of the 2025 70 DNL noise contours extend approximately 200 to 250 feet beyond both ends of Runway 10/28; the contours extend from each runway end toward the middle, but do not connect. The 75 DNL contour extends less than 100 feet beyond the ends of Runway 10/28. Both the 70 and 75 DNL noise contours are concentrated at the ends of Runway 10/28, and remain in close proximity to the runway entirely on airport property.

Summary

The updated noise contours in combination with Skagit County land use controls on property in the vicinity of the airport indicate that noise related incompatibility should not become a significant issue of concern during the planning period. Nevertheless, perceived noise impacts and resulting complaints are not necessarily confined to areas that fall under the 65 DNL or higher significant thresholds established by federal regulatory agencies. For that reason the Port must continue to work closely with County land use officials and the community to avoid creating any potential long-term land use incompatibilities on land surrounding BVS. For purposes of assessing long term land use compatibility, the Port also commissioned a set of 50-year noise contours based on the forecasts contained in Chapter Two. The figure and data runs are provided in **Appendix H**.



LEGEND

NOISE CONTOURS ——— 65 ———
DAY-NIGHT LEVEL (DNL)
ZONES
- BR-I BAYVIEW RIDGE INDUSTRIAL
- AVR AVIATION RELATED
- RRV RURAL RESERVE
- RI RURAL INTERMEDIATE
- Ag-NRL AGRICULTURAL NRL

SOURCE: WALKER AND ASSOCIATES (6-17-04)

NOTES:
1.) FAA INM VERSION 6.1 USED TO DEVELOP NOISE CONTOURS. CONTOURS BASED ON MASTER PLAN BASE YEAR ESTIMATE OF AIRCRAFT OPERATIONS FOR 2004.

2.) 55 AND 60 DNL NOISE CONTOURS DEPICTED FOR CONSISTENCY WITH LOCAL LAND USE PLANNING. FAA RECOGNIZES NOISE CONTOUR LEVELS BEGINNING AT 65 DNL FOR AIRPORT NOISE AND LAND USE COMPATIBILITY PLANNING PURPOSES.

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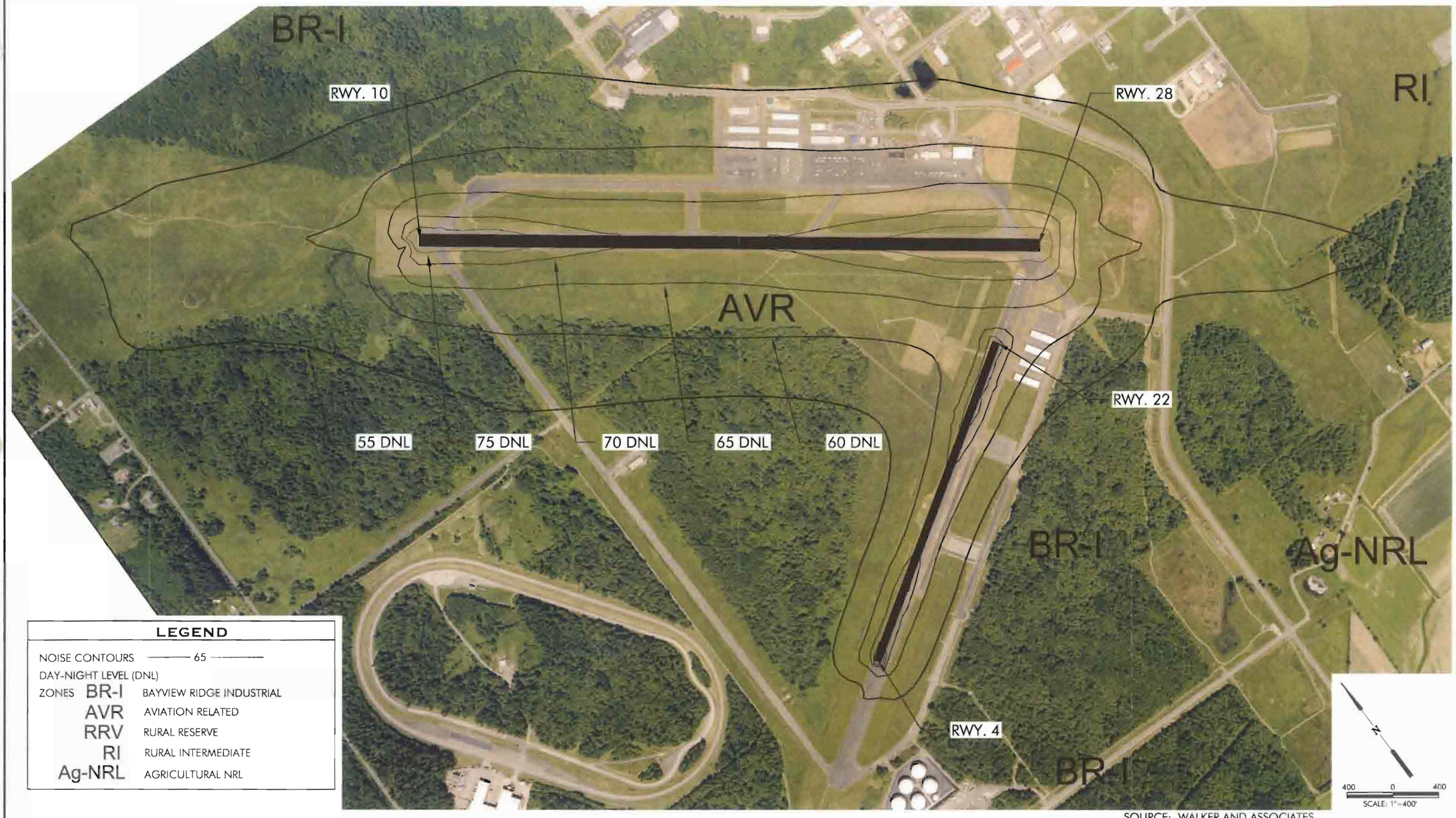
2004 NOISE CONTOURS

SKAGIT REGIONAL AIRPORT
AIRPORT MASTER PLAN

FIGURE 5-1



LEGEND

NOISE CONTOURS ——— 65 ———

DAY-NIGHT LEVEL (DNL)

ZONES
- BR-I — BAYVIEW RIDGE INDUSTRIAL
- AVR — AVIATION RELATED
- RRV — RURAL RESERVE
- RI — RURAL INTERMEDIATE
- Ag-NRL — AGRICULTURAL NRL

NOTES:
1.) FAA INM VERSION 6.1 USED TO DEVELOP NOISE CONTOURS. CONTOURS BASED ON MASTER PLAN FORECAST AIRCRAFT OPERATIONS FOR 2010.

2.) 55 AND 60 DNL NOISE CONTOURS DEPICTED FOR CONSISTENCY WITH LOCAL LAND USE PLANNING. FAA RECOGNIZES NOISE CONTOUR LEVELS BEGINNING AT 65 DNL FOR AIRPORT NOISE AND LAND USE COMPATIBILITY PLANNING PURPOSES.

SOURCE: WALKER AND ASSOCIATES (6-17-04)

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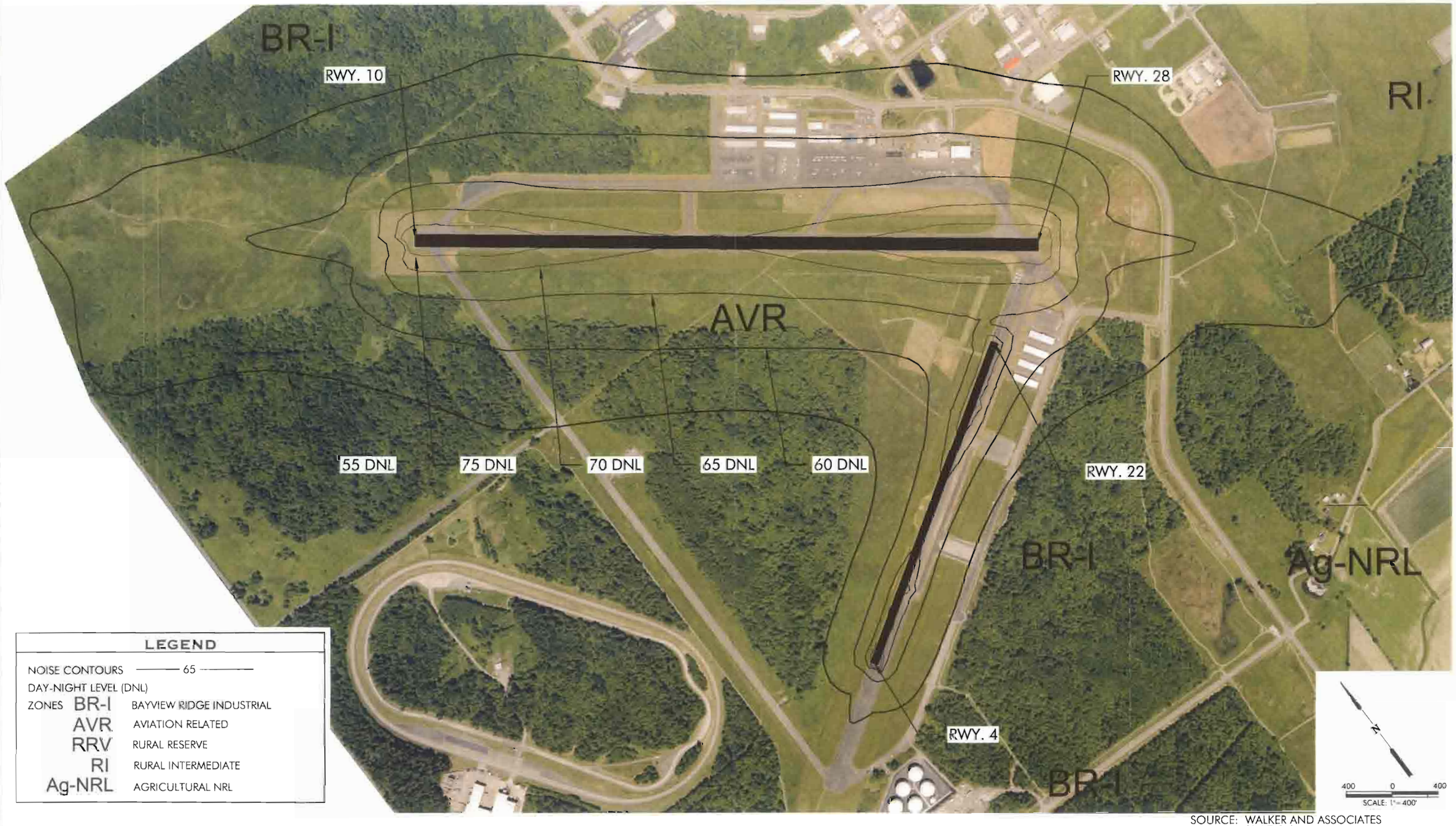
2010 NOISE CONTOURS

SKAGIT REGIONAL AIRPORT
AIRPORT MASTER PLAN

FIGURE 5-2



SOURCE: WALKER AND ASSOCIATES (6-17-04)

NOTES:
1.) FAA INM VERSION 6.1 USED TO DEVELOP NOISE CONTOURS. CONTOURS BASED ON MASTER PLAN FORECAST AIRCRAFT OPERATIONS FOR 2025.

2.) 55 AND 60 DNL NOISE CONTOURS DEPICTED FOR CONSISTENCY WITH LOCAL LAND USE PLANNING. FAA RECOGNIZES NOISE CONTOUR LEVELS BEGINNING AT 65 DNL FOR AIRPORT NOISE AND LAND USE COMPATIBILITY PLANNING PURPOSES.

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2025 NOISE CONTOURS

SKAGIT REGIONAL AIRPORT
AIRPORT MASTER PLAN

FIGURE
5-3

TABLE 5-1: LAND-USE COMPATIBILITY WITH DNL

Yearly Day-Night Average Sound Level (DNL) in Decibels

Land Use	Below 65	65-70	70-75	75-80	80-85	Over 85
Residential						
Residential, other than mobile homes & transient lodgings	Y	N(1)	N(1)	N	N	N
Mobile Home Parks	Y	N	N	N	N	N
Transient Lodgings	Y	N(1)	N(1)	N(1)	N	N
Public Use						
Schools	Y	N(1)	N(1)	N	N	N
Hospitals and Nursing Homes	Y	25	30	N	N	N
Churches, Auditoriums, and Concert Halls	Y	25	30	N	N	N
Government Services	Y	Y	25	30	N	N
Transportation	Y	Y	Y(2)	Y(3)	Y(4)	Y(4)
Parking	Y	Y	Y(2)	Y(3)	Y(4)	N
Commercial Use						
Offices, Business and Professional	Y	Y	25	30	N	N
Wholesale and Retail-Building Materials, Hardware and Farm Equipment and Farm Equipment	Y	Y	Y(2)	Y(3)	Y(4)	N
Retail Trade-General	Y	Y	25	30	N	N
Utilities	Y	Y	Y(2)	Y(3)	Y(4)	N
Communication	Y	Y	25	30	N	N
Manufacturing and Production						
Manufacturing General	Y	Y	Y(2)	Y(3)	Y(4)	N
Photographic and Optical	Y	Y	25	30	N	N
Agriculture (except livestock) and Forestry	Y	Y(6)	Y(7)	Y(8)	Y(8)	Y(8)
Livestock Farming and Breeding	Y	Y(6)	Y(7)	N	N	N
Mining and Fishing, Resource Production and Extraction	Y	Y	Y	Y	Y	Y
Recreational						
Outdoor Sports Arenas, Spectator Sports	Y	Y(5)	Y(5)	N	N	N
Outdoor Music Shells, Amphitheaters	Y	N	N	N	N	N
Nature Exhibits and Zoos	Y	Y	N	N	N	N
Amusement Parks, Resorts and Camps	Y	Y	Y	N	N	N
Golf Courses, Riding Stables and Water Recreation	Y	Y	25	30	N	N

Y (Yes)	Land-use and related structures compatible without restrictions.
N (No)	Land-use and related structures are not compatible and should be prohibited.
NLR	Noise Level Reduction (outdoor to indoor) to be achieved through incorporation of noise attenuation into design and construction of the structure.
25, 30 or 35	Land uses and structures generally compatible; measure to achieve NLR or 25, 30 or 35 dB must be incorporated into design and construction of the structure.

NOTES:

1. Where the community determines that residential uses must be allowed, measures to achieve outdoor to indoor Noise Levels Reduction (NLR) of at least 25dB and 30dB should be incorporated into building codes and be considered in individual approvals. Normal residential construction can be expected to provide a NLR of 20 dB; thus, the reduction requirements are often stated as 5, 10, or 15 dB over standard construction and normally assume mechanical ventilation and closed windows year-round. However, the use of NLR criteria will not eliminate outdoor noise problems.
2. Measures to achieve NLR of 25 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas, or where the normal noise level is low.
3. Measures to achieve NLR of 30 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas, or where the normal noise level is low.
4. Measures to achieve NLR of 35 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas, or where the normal noise level is low.
5. Land-use compatible, provided special sound reinforcement systems are installed.
6. Residential buildings require an NLR of 25.
7. Residential buildings require an NLR of 30.
8. Residential buildings not permitted.

SOURCE: Federal Aviation Regulations, Part 150, Airport Noise Compatibility Guidelines

SOCIOECONOMIC ISSUES

Skagit Regional Airport makes a significant contribution to the economy of Skagit County. Airport and adjoining industrial park businesses provide more than 855 full-time jobs. In addition, proposed improvements contained in the master plan update will facilitate the potential for more than doubling current employment at the airport during the planning period. While remaining very important, these jobs will still comprise less than two percent of the County's total non-farm employment. However, BVS plays an even greater role in the economy of Skagit County through its unique ability to provide a variety of essential aviation related services to the County's businesses and citizens. Furthermore, significant increases in traffic congestion in the adjoining Snohomish and King County sections of the Interstate 5 corridor are expected to continue in future years. This will make it increasingly costly and time consuming for Skagit County businesses and residents to rely on the major regional airports in those counties for many of their aviation needs.

Improvements under the preferred alternative will allow Skagit Regional Airport to better accommodate a wide range of aviation needs. These include more tiedown and T-hangar space for general aviation users, expansion areas for new and existing fixed base operators and other businesses and aeronautical-related commercial development. Improvements to airport systems will provide significant economic benefits and positive impacts for users over time.

The foreseeable induced or secondary impacts of the master plan proposed improvements relate primarily to the positive economic impacts associated with job creation during construction, potential for increased employment in aviation related businesses, and opportunities for increased commerce for businesses reliant on the airport.

Potential Businesses, Workers or Residents Displacements

The proposed improvements contained in the master plan update will not require any displacement of existing businesses or workers on or near the airport. No displacement of residents located near the airport will occur.

AIR QUALITY

Under FAA air quality review criteria (FAA Order 5050.4A (5)), runway development, physical airside and/or landside improvements which increase airport capacity shall be reviewed to determine if an air quality analysis needs to be done for an environmental assessment related to a proposed Federal approval action. The improvements contained in the Skagit Regional Airport master plan including its preferred alternative fall under this category. The procedures defined in these criteria were followed to determine whether an air quality analysis is needed for the BVS master plan update. It was first confirmed that according to the FAA Air Quality Handbook (Appendix J), the State of Washington does not have indirect source review (ISR) requirements. It was then confirmed that the master plan including its preferred alternative is based on a 2025 forecast of 81,462 annual operations. This level of operations falls well below the general aviation airport 180,000 annual operations forecast threshold requiring air quality analysis under these criteria in states that do not have ISR requirements.

In addition, it was confirmed with the Northwest Air Pollution Authority (NWAPA) that no portion of Skagit County is located within any type of air quality non-attainment area. According to its staff (June 9, 2005 electronic mail communication from Axel Franzmann to Dennis Derickson, DEA), *"There have not been any exceedances of applicable ambient air quality standards in our jurisdiction in several years, and the entire area is assumed to be in attainment for all criteria pollutants."*

In compliance with applicable federal, state and local air quality requirements, appropriate measures to minimize adverse air quality effects will be taken by the Port during construction and subsequent operation of facilities contained in the BVS master plan update.

Potential measures for reducing air quality impacts during construction include measures for reducing both equipment/vehicle exhaust emissions and fugitive dust. The Washington Associated

General Contractors brochure Guide to Handling Fugitive Dust from Construction Projects and the NWAPA- suggest a number of methods for controlling dust and reducing the potential exposure of people to emissions from diesel equipment. Examples of methods that could be implemented to reduce potential impacts at on-site and off-site locations during construction include: use only equipment and trucks that are maintained in optimal operational condition; implement restrictions on construction truck and equipment idling; spray exposed soil with water or other suppressant to reduce deposition of particulate matter; pave or use gravel on staging areas and roads that would be exposed for long periods; and cover dirt, gravel and debris piles as needed to reduce dust and wind-blown debris.

Potential measures for reducing the potential for air quality impacts during operation of the improved site include: establishment of a commute trip reduction program for site employees to reduce single occupant vehicle trips; and implementation of BMPs for aircraft repair and maintenance activities to help prevent discharge of unwanted pollutants into the environment.

WATER QUALITY AND DRAINAGE

The analysis is focused on drainages and water bodies in the vicinity of master plan proposed improvements that could be affected. Generally, water quality impacts from the types of airport improvements and activities being planned originate from the following:

- Erosion of exposed soils during construction, which causes increased short-term sedimentation and turbidity, where newly exposed soils are readily eroded by stormwater runoff;
- Reduced infiltration and increased runoff from converting pervious, vegetated areas to impervious surfaces, which increase stream flows and erosion rates;
- Pollutants that collect on impervious surfaces, such as oils, grease, and metals from aircraft, trucks, machinery, and automobiles that are washed off by stormwater runoff; and
- Potential spills of fuel, oil, solvents, and other hazardous materials during aircraft refueling, maintenance and repair activities.

Water quality classifications for surface waters within Washington State are based on protecting beneficial uses, such as water supply, recreation, and fisheries. Chapter 173-201A of the Washington Administrative Code (WAC) specifies the water quality classification for major Washington streams and lakes. Surface waters of the state are classified as AA, A, B, C, and Lake. **Table 5-2** provides general water use criteria for each classification. The major contributing

factor to water quality in streams and rivers is land use, with the best quality typically found in watersheds that are less developed.

TABLE 5-2: GENERAL WATER USE CRITERIA

Classification	Fecal Coliform	Dissolved Oxygen	Temperature	pH
Lake	Geometric mean value shall not exceed 50 colonies/100 ml with not more than 10 percent of the samples exceeding 100 colonies/100 ml	No measurable decrease from natural conditions	No measurable change from natural conditions	No measurable change from natural conditions
AA	Same as above	Shall exceed 9.5 mg/L	Shall not exceed 16° C	Shall be within 6.5 and 8.5
A	Geometric mean value shall not exceed 100 colonies/100 ml, with not more than 10 percent of the samples exceeding 200 colonies/100 ml	Shall exceed 8.0 mg/L	Shall not exceed 18° C	Same as above
B	Geometric mean value shall not exceed 200 colonies/100 ml, with not more than 10 percent of the samples exceeding 400 colonies/ml	Shall exceed 6.5 mg/L	Shall not exceed 21° C	Same as above
C	Geometric mean value shall not exceed 200 colonies/100 ml, with not more than 10 percent of the samples exceeding 400 colonies/ml	Shall exceed 4.0 mg/L	Shall not exceed 22° C	Shall be within 6.5 to 9.0

Source: WAC Chapter 173-201A.

The portions of streams and water bodies near to the project study area are designated Class A, including Big Indian Slough, Little Indian Slough, No Name Slough, and Joe Leary Slough. See **Figures 5-4** and **5-5**. Several water bodies in the project vicinity are listed on the Clean Water Act 303(d) list for exceeding various water quality parameters. The lower portion of Big Indian Slough does not meet Class A standards for temperature, fecal coliform, and dissolved oxygen. The majority of No Name Slough does not meet Class A standards for dissolved oxygen and fecal coliform. A small portion of Joe Leary Slough near the mouth, does not meet Class A standards for temperature, fecal coliform, and dissolved oxygen. A small area in Padilla Bay between Joe Leary Slough and No Name Slough does not meet Class A marine standards for PCB-1254, dissolved oxygen, pH, Bis (2-ethylhexyl) Phthalate, and cyanide. Several other unnamed drainages flow near the project study area, none of which are listed on the Clean Water Act 303(d) list. Characteristic uses of water bodies in the project vicinity according to WAC 173-201A-600 include:

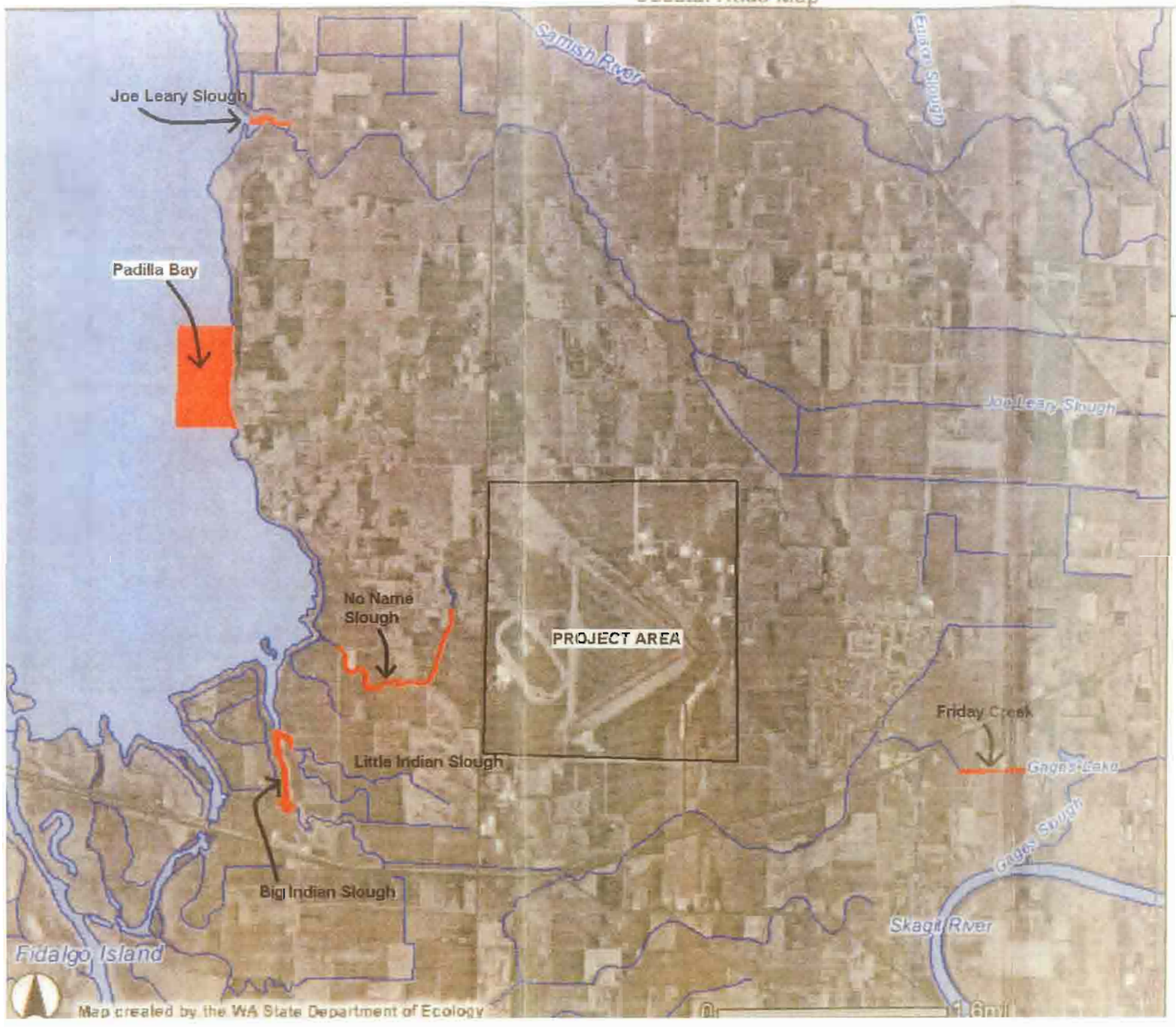
- Salmon and trout spawning, noncore rearing, and migration;
- Primary contact recreation;
- Domestic, industrial, and agricultural water supply;
- Stock watering;
- Wildlife habitat;
- Harvesting;
- Commerce and navigation;
- Boating; and
- Aesthetic values.

These uses are consistent with the uses and improvements proposed by the master plan update including the preferred alternative.

One drainage (#1224127484549 (state classification system)) flows south on the west side of the runway 04/22 and into a roadside ditch adjacent to Ovenell Road, which terminates in Big Indian Slough. Another drainage (#1224153484511) flows west of the Port industrial area and into Big Indian Slough.

The airport study area includes a substantial amount of paved road, parking, tiedown and runway surfaces in combination with a significant number of large and small-scale buildings. However, a majority of the site consists of pervious or semi-pervious vegetated and formally landscaped area.

Coastal Atlas Map



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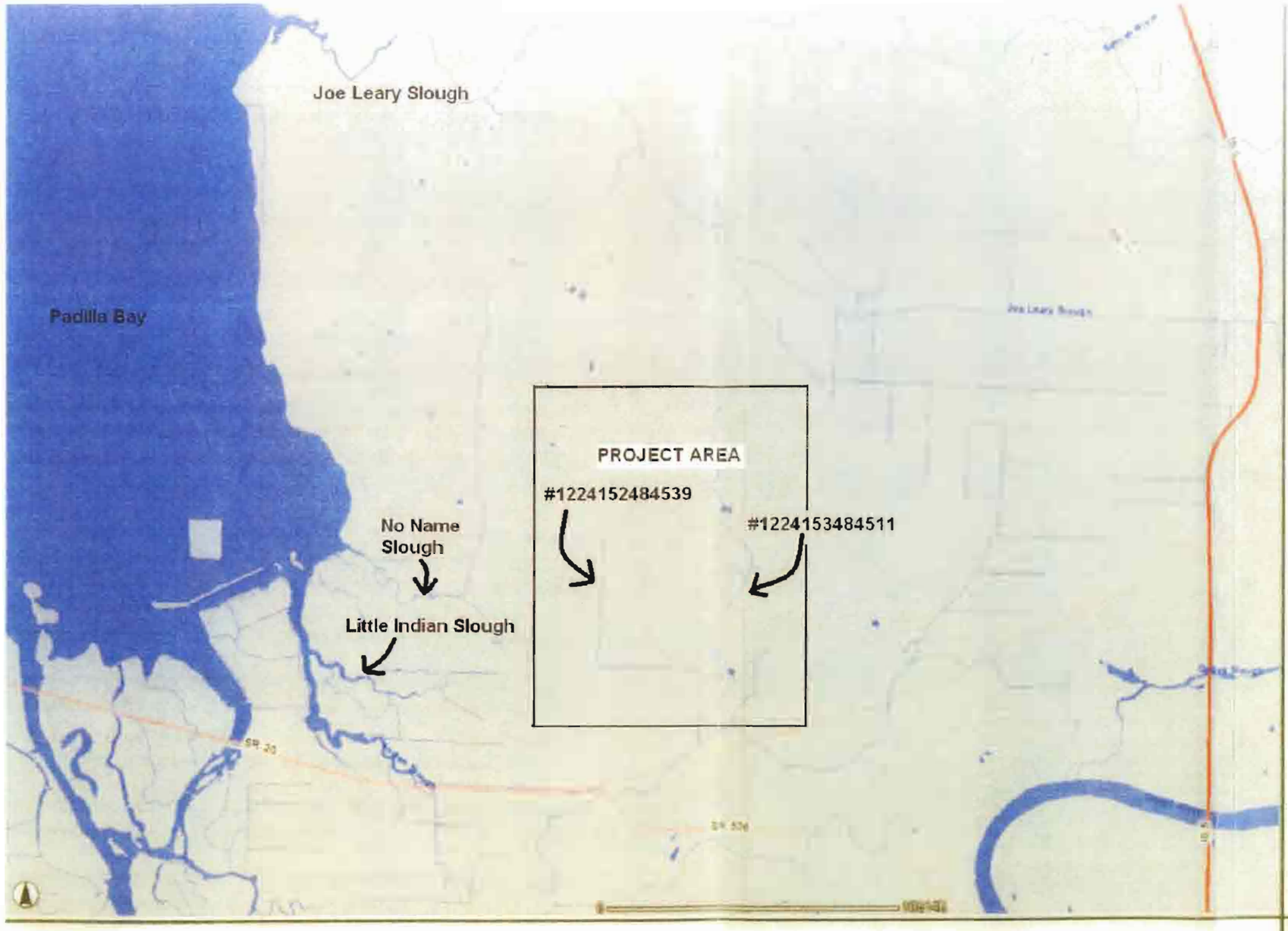
PROJECT AREA STREAMS AND WATER BODIES WITH WATER QUALITY EXCEEDANCES

SKAGIT REGIONAL AIRPORT
AIRPORT MASTER PLAN

FIGURE 5-4



Legend

CITIES
- Major Cities
- Cities
- Towns

RIVERS (1:24,000)

DOT Hwys
- Interstate
- US Hwys
- State Routes

WATERBODIES (1:24,000)

COUNTY

The Department of Fish and Wildlife Olympia, Washington

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PROJECT AREA
STREAMS AND WATER BODIES

SKAGIT REGIONAL AIRPORT
AIRPORT MASTER PLAN

FIGURE
5-5

The following laws and local jurisdictions address water quality issues that may be applicable to the proposed project:

- National Environmental Policy Act (NEPA);
- Environmental Protection Agency (EPA) National Pollutant Discharge Elimination System (NPDES) Permit Regulations;
- Presidential Executive Orders 11988 and 11990 Requiring Federal Agencies to Protect Floodplains and Wetlands;
- Washington State Department of Ecology (Ecology) Regulations; and
- Skagit County, Stormwater and Water Quality Regulations.

Various laws and jurisdictions address hydrology (water quantity) impacts associated with development. The Department of Ecology has published its most current guidelines for stormwater management in the *Stormwater Management Manual for the Puget Sound Region* (Ecology 2005).

Overall water quality in the project study area has been tested on a quarterly basis since the fall of 2003 according to Ecology's Stormwater General Permit for industrial sites (permit number SO3-000931D) and has been found to meet all standards. However, downstream of the project study area, near Padilla Bay, various streams have poor water quality, including Big Indian Slough, which receives water from the surrounding Bayview Ridge area including the airport study area.

Construction activities related to the master plan proposed expansion of existing aviation related uses and infill of underutilized areas of the site with similar uses, could result in temporary erosion and sedimentation that could impact water quality in nearby portions of Big Indian Slough and No Name Slough. These construction activities may include grading and filling.

Impacts to water quality could also occur during construction if fuels, grease or other hazardous substances are spilled into any of these same nearby water bodies.

Short-term sediment, erosion, and other potential pollutant impacts from construction of these improvements, if controlled with adequate BMPs, would not be significant.

The master plan update recommended improvements would create a net increase in existing site impervious area. As a result, stormwater runoff rates and amounts would increase. Water runoff from more intensively used existing impervious surfaces of the site could also have an adverse impact on water quality. This would occur if pollutants (i.e., oil, grease, metals, hazardous materials and litter or debris), collected on these surfaces, are washed into receiving waters.

However, the Port will use appropriate environmental best management practices (BMPs) in the construction and operation of all the improved and expanded airport facilities. Examples of these BMPs would include but will not be limited to the following:

- Install silt fence and utilize other BMP's to prevent sediments from being transported off of construction sites;
- Design aviation fuel storage tanks refilling area to prevent the run-off of stormwater and runoff of spills; and
- Use a perimeter drain, or slope the aviation fuel tanks refilling area to a dead-end sump or oil/water separator.

Also with regard to aviation fueling facilities, the master plan proposes to remove all existing facilities, (including underground tanks), and replace them with two new facilities equipped with above ground double walled tanks that meet IFC & NFPA secondary containment requirements.

Prior to construction of any major improvements, the Port will seek coverage under the Construction Stormwater Permit for Sites Greater than 5 Acres from the Washington State Department of Ecology and abide by the requirements specified under that coverage. Specific construction BMPs will be identified through this process. The Port will also obtain required approval from agencies with jurisdiction for the design, construction and operation of the two proposed aircraft fueling facilities. These facilities will be designed to provide maximum use of BMPs. The Port will also consult with state and federal agencies to determine whether the improvements proposed in its master plan update will require updating of its current NPDES Permit. The applicable provisions of Appendix 2 of FAA Order 1050.1.B., "*Prevention, Control, Abatement of Environmental Pollution at FAA Facilities*" and FAA Advisory Circular 150/5370-10 will also be used to minimize and avoid adverse impacts to water quality.

The Port's 1998 Stormwater Management Master Plan resulted in the development of stormwater detention and treatment areas for all airport facilities and its adjoining industrial park. All future development will be required to provide on-site stormwater treatment per current standards and regulations. At present, Skagit County has adopted the 1992 Washington State Department of Ecology *Stormwater Manual for the Puget Sound Basin* as the acceptable standard for water quality treatment.

Impacts would also be minimized by using and revising as necessary the Port's existing airport stormwater pollution prevention plan (SWPPP) and its BMPs. To ensure effectiveness of the operational BMPs, regular equipment inspection and maintenance, and facility worker training would be carried out.

TRANSPORTATION

Ground access is provided to the airport via the Interstate (I-5), State Route 20 (SR20), Skagit County public roads and several Port-owned and maintained roads.

Higgins Airport Way, the southern portion of which is a Skagit County maintained road, connects the airport property with both SR20 and Josh Wilson Road. The Higgins Airport Way and SR20 intersection is not signalized and is currently at Level of Service (LOS) "D." Outbound traffic often experiences delays with left turns.

Josh Wilson Road, a Skagit County major collector, provides access to I-5 from the north end of the airport. Higgins Airport Way continues north through the airport to Josh Wilson Road connecting at a point approximately 3.7 miles from I-5. This road does not handle the same volume of freight traffic as SR20, but does accommodate over 4,000 ADT (Average Daily Trips).

Channelization and possible signalization improvements are planned in 2007 for the intersection of Higgins Airport Way and SR20 when the Washington State Department of Transportation improves SR 20. Additional improvements to internal site access roads will be made in conjunction with planned facility improvements.

Proposed master plan improvements on the site will produce a substantial increase in daily vehicular trips. This increase could range from 1000 to 2000 additional daily trips. Many of these trips will occur during normal weekday morning and evening peak hour periods. A detailed Traffic Impact Analysis Report was prepared by Summit Engineer and Surveyors in April 2001 which looked at traffic related impacts occurring from development of the Phase II Binding Site Plan.

DEPARTMENT OF TRANSPORTATION SECTION 4(F)

As noted in the FAA's Order 5050.4A, the provisions of Section 4(f) of the Federal Department of Transportation (DOT) Act do not allow the Secretary to approve any program or project which requires the use of any publicly owned land from a public park, recreation area, or wildlife and waterfowl refuge of national, state, or local significance or land of a historic site of national, state or local significance unless there is no feasible and prudent alternative and all possible steps are taken to minimize harm. This use of such areas can be in the form of actual physical taking, other form of use or imposition of adverse impact.

In order to determine if any form of use of such publicly owned land or historic sites would result from the improvements proposed in the master plan update, a survey of the airport study area

including nearby property was performed. This survey confirmed that no public parks, recreation areas or wildlife and waterfowl refuges are located within the airport's potential area of adverse impacts. Furthermore, no master projects/activities will physically take or otherwise use any such areas. In addition, information provided by the Washington Office of Archaeology and Historic Preservation (OAHP), confirmed that there are no known places located on airport property or within its potential area of adverse impacts that are listed on or are proposed for listing on the National Register of Historic Places or the Washington Heritage Register, (June 9, 2005 review of OAHP records by Liliana Guifarro, DEA).

This survey also determined there are no known archeological or cultural resource sites mapped by OAHP on airport property or within its immediate surroundings that may be affected by the proposed master plan alternatives. Please see the next section of this chapter for additional information.

HISTORIC, ARCHAEOLOGICAL AND CULTURAL RESOURCES

Information provided by OAHP, confirmed that there are no known places located on airport property or within its potential adverse impacts that are listed on or are proposed for listing on the National Register of Historic Places or the Washington Heritage Register, (June 9, 2005 review of OAHP records by Liliana Guifarro, DEA).

In addition, it was determined there are no known archeological or cultural resource sites mapped by OAHP on airport property or its immediate surroundings that may be affected by the proposed master plan alternatives.

A review of OAHP records indicates that the two closest mapped archeological sites are located approximately 4,000 to 8,000 feet away from the airport study area. Conversations with Dr. Sarah Campbell, Professor of Anthropology at Western Washington University, indicate that archeological sites are known to occur on terraces around Padilla Bay (June 1, 2005 personal communication with Sara Young, David Evans & Associates, Inc.).

Contact with the Swinomish Indian Tribe was done by the Port through an official request for comments letter as part of the SEPA review. No response was provided.

In the event that future construction of recommended master plan facilities encounter historical, archaeological or cultural artifacts, construction would be halted and a qualified archaeologist consulted. The affected Tribes and other appropriate authorities will also be notified immediately.

BIOTIC COMMUNITIES AND ENDANGERED SPECIES

Vegetation in the airport study area consists of grasses, trees and shrubs. Limited tree and shrub removal are proposed near the west end of the Runway 10/28 flightline with all development alternatives. Wetland vegetation will be removed near the east-end of the Runway 10/28 flightline with Alternatives 1 and 2. Alternative 3 proposes additional removal of wetland vegetation, trees and shrubs at the west-end of the Runway 10/28 flightline.

Listed plant species documented on or near the site include bristly sedge (*Carex comosa*), listed as a state sensitive species. The plant has no federal listing status and was last observed in the vicinity in 1933. No current observations of listed plants are documented on or near the site by the Washington State Department of Natural Resources.

Vegetation will be retained in all areas until project-specific construction requires removal. The removal footprint will be limited to the extent necessary for construction purposes. Native plants will be incorporated into the site landscaping plan wherever feasible.

Hawks, herons, eagles and songbirds are present on and near the airport study area. The site is located within the Pacific Migratory Flyway and is located in close proximity to Padilla Bay, an area that is heavily used by migrating shorebirds and waterfowl. High quality wetlands on the property also provides habitat for migrating birds. FAA Advisory Circular, AC 150/5200, provides guidance regarding wildlife attractions on or near airports. For safety reasons, the guidance recommends that any wildlife attractions be located at least 10,000 feet from any turbine-use runway, such as the Skagit Regional Airport.

Deer and coyote are the most common larger mammals present on and near the site.

One federally listed species, Bald eagles, have been documented in the area surrounding the airport. A nest is located off of the Port's property approximately ½ mile south of the airfield. Coho salmon, a federal species of concern, have been documented in Higgins Slough south of the Master Plan area.

All project-specific construction will comply with applicable local, state and federal laws for protection of wildlife. The master plan alternatives emphasize consolidation of development to allow preservation of larger contiguous areas of open space surrounding the airfield facilities. Clearing of forested areas will occur only on a project-specific basis with native vegetation retained to the maximum extent possible.

Vegetation will be retained in all areas until project-specific construction requires removal. The removal footprint will be limited to the extent necessary for construction purposes. Native plants will be incorporated into the site landscaping plan wherever feasible.

WETLANDS, FLOODPLAINS, AND COASTAL MANAGEMENT ZONE AREAS

Wetlands

The airport and surrounding area contain extensive wetlands. Approximately 279 acres of wetlands have been delineated within the Port's Property through the Skagit WIN process that was initiated in 1994.

Construction of the proposed alternative plans for the airport will require filling of wetlands. The Skagit WIN agreement allows filling of 7.7 acres of lower functioning wetlands on the Port's property over a 20-year period beginning in the Year 2000 while permanently protecting 250 acres of the highest functioning wetlands. This wetland fill is authorized by U.S. Army Corps of Engineers permit no. 1999-4-00203.

The Skagit WIN process provided advanced compensation for wetland impacts to occur over the 20-year period of the agreement. The mitigation plan provides for 8 acres of wetland restoration, 6.5 acres of wetland enhancement, and 250 acres of preservation. This mitigation plan has been implemented and is currently in a 10-year monitoring period.

A small 1.65-acre area of wetland fill will be required for the preferred alternative at the east end of the runway 10/28 flightline area; a second area located near the end of Runway 22 may also need to be filled as part of the Runway 4/22 reconfiguration project. These fill areas are not included in Skagit WIN and would be in addition to the previously described 7.7-acre area. Additional wetland mitigation will be provided as required based on design requirements.

Floodplains

According to Skagit County's Federal Emergency Management Agency (FEMA) flood hazard maps, only a very small portion of BVS property is located within a FEMA designated flood boundary. See **Figure 5-6**. The southeast corner of airport property located south of Ovenell Road is located within the 100-year flood boundary (the base floodplain that must be considered under

FAA Order 5050.4A Floodplain environmental review criteria). However, no master plan project/activities are proposed for this area. In addition, no proposed projects/activities will indirectly support secondary development within any portion of the base floodplain on or near any portion of the airport study area or otherwise significantly impact this floodplain area.

Coastal Zone Management Areas

According to Skagit County's records no portion of airport property is located within a designated Coastal Zone Management Area. The closest such area is located along the edge of Padilla Bay more than a mile and half west of the site. Using FAA Order 5050.4A Coastal Zone Management Program environmental review criteria, it also has been determined that none of the master plan proposed projects/activities will generate potential significant impacts on the natural resources within any designated coastal areas. This includes water quality, biotic communities or construction impacts.

PRIME AND UNIQUE FARMLAND

Information provided by the Natural Resource and Conservation Service (NRCS) local office describes the soils on the site as Bow Gravelly Loam. This information confirms that no farmland defined as prime or unique by NRCS will be converted to other use as a direct result of the master plan proposed airport development or induced development. For that reason no further analysis is required under the Farmland Protection Act.

PORT OF SKAGIT COUNTY

CENTURY WEST ENGINEERING CORPORATION

DAVID EVANS AND ASSOCIATES INC

PROJECT AREA
FEMA/FIRM 100-YEAR FLOODPLAIN

SKAGIT REGIONAL AIRPORT
AIRPORT MASTER PLAN

FIGURE
5-6

Skagit Regional Airport
Airport Master Plan Update

Chapter Six

Financial and Development Program

CHAPTER SIX
FINANCIAL AND DEVELOPMENT PROGRAM

INTRODUCTION

The purpose of this chapter is to present the list of capital improvement projects that have been developed and assembled from the results of the Airport Facility Requirements and Airport Development Alternatives chapters (Chapter #3 and #4). The projects are summarized in **Tables 6-1 and 6-2**. Individual projects for the first five years of the planning period are listed in order of priority by year. Projects for the second phase of the planning period (years 6-20) are listed in order of priority but have not been assigned a year. Pavement maintenance projects during the second phase have been assigned a year, due to their programmatic nature. The tables provide a listing of the major capital projects included in the twenty-year CIP, including each project's eligibility for FAA funding, based on current legislation.

A primary source of potential funding identified in this plan is the FAA's Airport Improvement Program (AIP). As proposed, approximately 88 percent of the airport's 20-year CIP will be eligible for federal funding. Funds from this program are derived from the Aviation Trust Fund, which is the depository for all federal aviation taxes collected on such items as airline tickets, aviation fuel, lubricants, tires, aircraft registrations, and other aviation-related fees. These funds are distributed by FAA under appropriations set by Congress to all airports in the United States that have certified eligibility.

AIRPORT DEVELOPMENT SCHEDULE AND COST ESTIMATES

Cost estimates for each individual project have been developed in current dollars based on typical construction costs associated for the specific type of project. The project costs listed in the Capital Improvement Program represent order-of-magnitude estimates in 2005 dollar values and include design engineering and other related costs and contingencies. The estimates are intended only for preliminary planning and programming purposes. Specific project analysis and detailed engineering design will be required at the time of project implementation to provide more refined and detailed estimates the development costs.

In future years, as the plan is carried out, these cost estimates can continue to assist management by adjusting the 2005-based figures for subsequent inflation. This may be accomplished by converting the interim change in the United States Consumer Price Index (USCPI) into a multiplier ratio through the following formula:

$$\frac{X}{I} = Y$$

Where:
X = USCPI in any given future year
Y = Change Ratio
I = Current Index (USCPI)

USCPI
194.5
(1982-1984 = 100)
June 2005

Multiplying the change ratio (Y) times any 2005-based cost figures presented in this study will yield the adjusted dollar amounts appropriate in any future year evaluation.

The following sections outline the recommended development program and funding assumptions. The scheduling has been prepared according to the facility requirements determined earlier. The projected staging of development projects is based upon anticipated needs and investment priorities. Actual activity levels may vary from projected levels; therefore, the staging of development in this section should be viewed as a general guide. When activity does vary from projected levels, implementation of development projects should occur when demand warrants, rather than according to the estimated staging presented in this chapter. In addition to major development projects, the airport will require regular facility maintenance.

The first phase of the capital improvement program includes the highest priority projects recommended during the first five years. Long-term projects are anticipated to occur in the 6 to 20-year period, although changes in demand or other conditions could accelerate or slow demand for some improvements. As with most airports, pavement related improvements, including

ongoing pavement maintenance and rehabilitation, represent the largest portion of CIP needs at BVS during the current planning period.

Short Term Projects

The short-term program contains work items of the highest priority. Priority items include improvements related to safety and major pavement maintenance. Because of their priority, these items will need to be incorporated into Port and FAA capital improvement programming. To assist with this process, the short-term projects are scheduled in specific calendar years for the first five years of the planning period (2006-2010).

Short-term development projects include:

- New aircraft fuel islands on the Runway 10/28 and 4/22 flightlines. *(Completed in 2006);*
- A new airport service road that will extend beyond the runway safety area and object free area for Runway 28. The road will accommodate authorized on-airport traffic (airport maintenance vehicles, fuel trucks, etc.) to move between the main flightlines without accessing runways or major taxiways. *(Completed in 2006);*
- Repair of soft spots and transverse drains on Runway 10/28 to increase runway pavement strength;
- Upgrade runway markings to reflect instrument approach capabilities;
- Improvements to the taxiway configuration and run-up area the connections between Taxiway G and the end of Runway 28;
- Replace VASIs on Runway 10/28 with PAPIs;
- Several security improvements, such as installing locks on all pedestrian gates and installing additional chain link security fencing around the ends of Runway 10 and Runway 28 and other unfenced portions of the airport operations area;
- Construction of two 10-12 unit T-hangars based on market demand;
- Pavement maintenance including crack filling and seal coat projects for several of the main airfield pavement surfaces; and
- Asphalt overlay recommended for Taxiway A.

Long Term Projects

The long term projects include programmed pavement maintenance; continued development of landside facilities (aprons, taxiways, taxilanes, etc.) in the Runway 10/28 and 4/22 flight lines; and relocation of Runway 04/22 *(configuration pending final FAA-Port decision)* to bring the runway-taxiway separation into compliance with current FAA standards. Most major taxiways and apron areas will require asphalt overlays within the 20-year planning period. Anticipated long-term hangar construction includes replacement of five older existing Port-owned T-hangars and additional T-hangar space based on market demand.

Commercial aeronautical-related development will consist of the expansion of the Runway 10/28 flight line into Lot 72. This area will be configured with several lease lots to accommodate a variety of larger conventional hangars. Taxiway access to this area will be extended from the existing end of the main apron, with connections provided to each lease lot. A new designated helicopter parking area is also recommended near the east end of the expanded development area. Additional vehicle access to the "Lot 72" area will be provided through development of frontage roads connecting to Higgins Airport Way. The planned development in this area is configured to avoid locating any structures within the Runway 4/22 ultimate object free area (OFA) that extends beyond the ultimate runway projection zone for the relocated and shifted Runway 4/22.

The planned redevelopment of the west end of the Runway 10/28 flightline involves a conversion from aircraft storage to job-creating commercial aeronautical uses. Five existing Port-owned T-hangars located in this area will be demolished at the end of their useful lives and replaced on the Runway 04/22 flight line. Development of a single row of small conventional or executive hangars along Taxiway F will be pursued based on market conditions. Initial site improvements will include extending vehicle access, utilities and storm drainage systems along the west side of the taxiway. Taxiway F will be narrowed from its current 50-foot width, to 35 feet, which is consistent with recommended FAA design standards; the taxiway centerline will be shifted 7.5 feet east to maximize the developable area for the hangar row.

An infield taxiway and south side parallel taxiway for Runway 10/28 are identified as long-term development reserves. It is anticipated that the volume of aircraft taxiing between the 4/22 flightline and Runway 10/28 will increase significantly, which will eventually create congestion on Taxiway G, near the ends of Runways 28 and 22. An infield taxiway and south parallel taxiway will allow aircraft taxiing between the 4/22 flightline and the main runway to avoid crossing the runway to access Taxiway A.

Port of Skagit
Skagit Regional Airport
2007-2026

20-YEAR CAPITAL IMPROVEMENT PROGRAM

Short Term	Yr	Project	Project Category	Unit	Quantity	Unit Cost	Total Cost	FAA GA Entitlement	FAA Other Funding	Local Costs	GA Year		
2007	1	No Projects											
Subtotal - Year 1							$ -	$ -	$ -	$ -			
2008	2	Relocate Rotating Beacon	Other	LS	1	$ 15,000	$ 15,000	$ 14,250	$ -	$ 750	2007	$ 14,250	
		Construct Hangars & Taxilanes (2)	Other; Pavement Const.	LS	2	$ 812,000	$ 1,624,000	$ 135,750	$ 40,238	$ 1,448,013	2007	$ 135,750	$ 150,000
		Taxiway A Fog Seal w/ New Markings	Pavement Maintenance	SY	39,200	$ 0.75	$ 29,400	$ 27,930	$ -	$ 1,470	2008	$ 27,930	
		Underground Fuel Storage Tank Removal	Other	LS	1	$ 20,000	$ 20,000	$ 19,000	$ -	$ 1,000	2008	$ 19,000	
		Lot 72 Vehicular Access Road from Higgins Airport Way	Other	LS	1	$ 116,000	$ 116,000	$ 103,070	$ 7,130	$ 5,800	2008	$ 103,070	$ 150,000
		Terminal Apron and Taxiway A Expansion (Lot 72)	Pavement Construction	SY	8,167	$ 75.00	$ 612,500	$ -	$ 581,875	$ 30,625			
		Runway 10/28 Safety Area Compaction	Safety	LS	1	$ 30,000	$ 30,000	$ -	$ 28,500	$ 1,500			
Subtotal - Year 2							$ 2,446,900	$ 300,000	$ 657,743	$ 1,489,158			
2009	3	Security Improvements (Taxiway F to Taxiway A)	Security	LF	8,100	$ 18.00	$ 145,800	$ 138,510	$ -	$ 7,290	2009	$ 138,510	
		Security Improvements (Locking Ped Gates and Security Fencing Lot 72)	Security	LS	1	$ 63,000	$ 63,000	$ 11,490	$ 48,360	$ 3,150	2009	$ 11,490	$ 150,000
		Terminal Apron Area Fog Seal w/ New Markings and Parking Positions	Pavement Maintenance	SY	77,212	$ 0.75	$ 57,909	$ -	$ 55,014	$ 2,895			
		Relocate Runway 04 & 22 Thresholds; Reconfigure Taxiway Connections & AC Hold Areas, Lighting, Signage; Relocate PAPIs; Demo Pavement beyond Relocated Rwy 22 Threshold; Extend Taxiway G to Rwy 4 end; Fog Seal; Repaint Markings	Pavement Maintenance	LS	1	$ 495,000	$ 495,000	$ -	$ 470,250	$ 24,750			
		Runway 10/28 PAPI	Other	Ea	2	$ 30,000	$ 60,000	$ -	$ 57,000	$ 3,000			
		Taxiway G Fog Seal w/ New Markings	Pavement Maintenance	SY	12,334	$ 0.75	$ 9,251	$ -	$ 8,788	$ 463			
		Rwy 04/22 Taxilanes/Cargo Apron/Fueling Apron Fog Seal	Pavement Maintenance	SY	37,776	$ 0.75	$ 28,332	$ -	$ 26,916	$ 1,417			
		Construct Hangar & Taxilane (1)	Other; Pavement Const.	LS	1	$ 812,000	$ 812,000	$ -	$ 87,994	$ 724,006			
Subtotal - Year 3							$ 1,671,292	$ 150,000	$ 754,321	$ 766,971			
										$ -			
2010	4	Runway 10/28 repair/rehabilitation (maintenance overlay); repaint NPI/PIR mkgs	Pavement Maintenance	LS	1	$ 3,290,000	$ 3,290,000	$ 150,000	$ 2,975,500	$ 164,500	2010	$ 150,000	
Subtotal - Year 4							$ 3,290,000	$ 150,000	$ 2,975,500	$ 164,500			
						Yr 0-4 Total	$ 7,408,192	$ 600,000	$ 4,387,564	$ 2,420,628			

Long Term	Yr	Project	Project Category	Unit	Quantity	Unit Cost	Total Cost	FAA GA Entitlement	FAA Other Funding	Local Matching Costs	GA Year		
2011	6	Taxiway A Overlay (2011)	Pavement Maintenance	SY	39,200	$ 40.00	$ 1,568,004	$ 150,000	$ 1,339,604	$ 78,400	2011	$ 150,000	
		Obstruction Removal (2011)	Safety	LS	1	$ 25,000	$ 25,000	$ -	$ 23,750	$ 1,250			
2012	7	Terminal Apron Partial Overlay and Seal Coat (2012)	Pavement Maintenance	SY	77,212	$ 18.00	$ 1,389,818	$ 150,000	$ 1,170,327	$ 69,491	2012	$ 150,000	
2013	8	Taxiway F Overlay (2013)	Pavement Maintenance	SY	22,664	$ 40.00	$ 906,578	$ 150,000	$ 711,249	$ 45,329	2013	$ 150,000	
		Rwy 04/22/Taxilanes/Cargo Apron/Fueling Apron Slurry Seal (2013)	Pavement Maintenance	SY	37,776	$ 3.60	$ 135,995	$ -	$ 129,195	$ 6,800			
		Construct (3) Taxilanes for T-Hangars (A,B,C) - 2013	Pavement Construction	SY	3,705	$ 75.00	$ 277,875	$ -	$ 263,981	$ 13,894			
		Replace Port-Owned T-Hangars (A,B,C) - 2013	Other	Ea	3	$ 719,325	$ 2,157,975	$ -	$ 2,050,076	$ 107,899			
		Demo Existing T-Hangars (A,B,C) Rwy 10/28 Flightline (2013)	Other	LS	3	$ 15,000	$ 45,000	$ -	$ 42,750	$ 2,250			
2014	9	Rwy 10/28 Flightline Redevelopment (west end) Apron (2014)	Pavement Construction	SY	1,500	$ 75.00	$ 112,500	$ 106,875	$ -	$ 5,625	2014	$ 106,875	
		Rwy 10/28 Flightline Redevelopment (west end) Access Road & Utilities (2014)	Other	LS	1.0	$ 37,500	$ 37,500	$ 35,625	$ -	$ 1,875	2014	$ 35,625	
		Taxiway G Overlay (2014)	Pavement Maintenance	SY	12,334	$ 40.00	$ 493,373	$ 7,500	$ 461,205	$ 24,669	2014	$ 7,500	$ 150,000
2015	10	Rwy 10/28 Flightline Redevelopment (east end) Apron (2015)	Pavement Construction	SY	1,500	$ 75.00	$ 112,500	$ 106,875	$ -	$ 5,625	2015	$ 106,875	
		Rwy 10/28 Flightline Redevelopment (east end) Access Road & Utilities (2015)	Other	LS	1.0	$ 37,500	$ 37,500	$ 35,625	$ -	$ 1,875	2015	$ 35,625	
		Taxiway A Fog Seal (2015)	Pavement Maintenance	SY	39,200	$ 0.75	$ 29,400	$ 7,500	$ 20,430	$ 1,470	2015	$ 7,500	
		Runway 10/28 Fog Seal w/ NPI/PIR Markings (2015)	Pavement Maintenance	SY	90,400	$ 0.75	$ 77,800	$ -	$ 73,910	$ 3,890	2015	$ -	$ 150,000
2016	11	Pavement Strengthening for Terminal Apron Large Aircraft Parking Positions (2016)	Pavement Construction	SY	550	$ 140	$ 77,000	$ 73,150	$ -	$ 3,850	2016	$ 73,150	
2017	12	Terminal Apron Fog Seal (2017)	Pavement Maintenance	SY	39,200	$ 0.75	$ 29,400	$ 27,930	$ -	$ 1,470	2016+2017	$ 27,930	
		Runway 10/28 Lighting Reconstruction (2017)	Safety	LS	1	$ 25,000	$ 25,000	$ 23,750	$ -	$ 1,250	2016+2017	$ 23,750	
		Closed Circuit Video System (2017)	Security	LS	1	$ 75,000	$ 75,000	$ 71,250	$ -	$ 3,750	2016+2017	$ 71,250	
		Construct Secondary Ovenell Road Access (2017)	Other	LS	1	$ 232,000	$ 232,000	$ 103,920	$ 116,480	$ 11,600	2017	$ 103,920	$ 300,000
2018	13	Taxiway F Fog Seal (2018)	Pavement Maintenance	SY	22,664	$ 0.75	$ 16,998	$ 16,148	$ -	$ 850	2018	$ 16,148	
		Rwy 04/22/Taxilanes/Cargo Apron/Fueling Apron Fog Seal (2018)	Pavement Maintenance	SY	37,776	$ 0.75	$ 28,332	$ 26,916	$ -	$ 1,417	2018	$ 26,916	
		Taxilanes for T-Hangars (A,B,C) Fog Seal (2018)	Pavement Maintenance	SY	3,705	$ 0.75	$ 2,779	$ 2,640	$ -	$ 139	2018	$ 2,640	
		Terminal Apron Floodlighting (2018)	Security	Ea	6	$ 7,500	$ 45,000	$ 42,750	$ -	$ 2,250	2018	$ 42,750	
2019	14	Taxiway G Fog Seal (2019)	Pavement Maintenance	SY	12,334	$ 0.75	$ 9,251	$ 8,788	$ -	$ 463	2018	$ 8,788	
2020	15	Runway 10/28 Slurry Seal, w/ Pvmt Markings (2020)	Pavement Maintenance	SY	90,400	$ 3.60	$ 335,440	$ 52,758	$ 265,910	$ 16,772	2018	$ 52,758	$ 150,000
		Taxiway A Slurry Seal (2020)	Pavement Maintenance	SY	39,200	$ 3.60	$ 141,120	$ 134,064	$ -	$ 7,056	2019	$ 134,064	
		Taxiway F Utility Development and Access Road (2020)	Other	LS	1	$ 2,732,000	$ 2,732,000	$ 165,936	$ 2,429,464	$ 136,600	2019/2020	$ 165,936	$ 300,000
2021	16	Demo Existing T-Hangars (D,E) Rwy 10/28 Flightline (2015) (2021)	Other	LS	2	$ 15,000	$ 30,000	$ 28,500	$ -	$ 1,500	2021	$ 28,500	
		Replace Port-Owned T-Hangars (D,E) - (2021)	Other	Ea	2	$ 719,325	$ 1,438,650	$ -	$ 1,366,718	$ 71,932			
		Construct Taxilanes for T-Hangars (D,E) - (2021)	Pavement Construction	SY	2,470	$ 75.00	$ 185,250	$ 121,500	$ 54,488	$ 9,263	2021	$ 121,500	$ 150,000
		Helicopter Parking Area (2021)	Pavement Construction	SY	2,778	$ 75.00	$ 208,333	$ -	$ 197,917	$ 10,417			
2022	17	Terminal Apron Slurry Seal (2022)	Pavement Maintenance	SY	77,212	$ 3.60	$ 277,964	$ 150,000	$ 114,065	$ 13,898	2022	$ 150,000	
2023	18	Taxilanes for T-Hangars (A,B,C) Slurry Seal (2023)	Pavement Maintenance	SY	3,705	$ 3.60	$ 13,338	$ 12,671	$ -	$ 667	2023	$ 12,671	
		Taxiway F Slurry Seal (2023)	Pavement Maintenance	SY	22,664	$ 3.60	$ 81,590	$ 77,511	$ 0	$ 4,080	2023	$ 77,511	
		Rwy 04/22/Taxilanes/Cargo Apron/Fueling Apron Slurry Seal (2023)	Pavement Maintenance	SY	37,776	$ 3.60	$ 135,995	$ 59,818	$ 69,377	$ 6,800	2023	$ 59,818	
		Taxiway G Extension (2023)	Pavement Construction	SY	7,778	$ 75.00	$ 583,333	$ -	$ 554,167	$ 29,167	2023	$ -	$ 150,000
		Narrow Taxiway F to 35 Feet w/ New Markings (2023)	Pavement Maintenance	SY	22,664	$ 0.30	$ 6,799	$ -	$ 6,459	$ 340			
		Taxiway F - Bayview Road Automated Gate (2023)	Security	Ea	1	$ 15,000	$ 15,000	$ -	$ 14,250	$ 750			
2024	19	Taxiway G Slurry Seal (2024)	Pavement Maintenance	SY	12,334	$ 3.60	$ 44,402	$ 42,182	$ -	$ 2,220	2024	$ 42,182	
		Environmental Assessment for Rwy 04-22 Lateral Shift (2024)	Safety	LS	1	$ 130,000	$ 130,000	$ 107,818	$ 15,682	$ 6,500	2024	$ 107,818	$ 150,000
2025-2026	20	Runway10/28 Slurry Seal w/ PIR Markings (2025)	Pavement Maintenance	SY	90,400	$ 3.60	$ 325,440	$ 300,000	$ 9,168	$ 16,272			
		Relocate Runway 04/22 90 feet - (Construct New Runway 3,000 x 60'); extend taxiway connections to Taxiway G.(2025)	Safety	LS	1	$ 3,660,000	$ 3,660,000	$ -	$ 3,477,000	$ 183,000			
		ALP Update (2025)	Other	LS	1	$ 10,000	$ 10,000	$ -	$ 9,500	$ 500			
		Taxiway A Fog Seal (2025)	Pavement Maintenance	SY	39,200	$ 0.75	$ 29,400	$ -	$ 27,930	$ 1,470			
		MALSR Approach Lighting System (2025)	Other	LS	1	$ 900,000	$ 900,000	$ -	$ 855,000	$ 45,000	2025-2026	$ 300,000	
Subtotal - Year 6-20							$ 19,231,634	$ 2,400,000	$ 15,870,053	$ 961,581			
						20 Yr Total	$ 26,639,826	$ 3,000,000	$ 20,257,617	$ 3,382,210			

Project Category	Short Term Total	Long Term Total	Short Term FAA EligibleTotal	Long Term FAA EligibleTotal	Short Term Local Match Total	Long Term Local Match Total	Category Total
Pavement Maintenance	$ 3,909,892	$ 6,079,217	$ 177,930	$ 1,376,427	$ 195,495	$ 303,961	$ 9,989,109
Pavement Construction	$ 3,048,500	$ 1,556,792	$ 135,750	$ 408,400	$ 2,202,644	$ 77,840	$ 4,605,292
Safety	$ 30,000	$ 3,840,000	$ -	$ 131,568	$ 1,500	$ 192,000	$ 3,870,000
Security	$ 208,800	$ 135,000	$ 150,000	$ 114,000	$ 10,440	$ 6,750	$ 343,800
Other	$ 211,000	$ 7,620,625	$ 136,320	$ 369,606	$ 10,550	$ 381,031	$ 7,831,625
	$ 7,408,192	$ 19,231,634	$ 600,000	$ 2,400,000	$ 2,420,628	$ 961,581	$ 26,639,826

CAPITAL FUNDING SOURCES

Federal Grants

Federal funding is provided through the federal Airport Improvement Program (AIP). This reauthorization is the latest evolution of a funding program originally authorized by Congress in 1946 as the Federal Aid to Airports Program (FAAP). The program provides grant funding for general aviation airports listed in the National Plan of Integrated Airport Systems (NPIAS). Under current legislation, general aviation airports can receive up to $150,000 per year in general aviation "non-primary entitlement" grants. If a project is anticipated to cost in excess of $150,000, the participating airport can roll over the funding allocations for up to four years, at which time the accumulated total of funds can be used for larger projects. Any unused funds that remain beyond the maximum allowable roll over period revert to the FAA for use at other airports.

The FAA also provides discretionary grants to airports. The dollar amounts of individual grants vary and can be significantly larger than the primary entitlements. Discretionary grants are awarded at the FAA's sole discretion. Discretionary funds are distributed after all entitlement funds have been allocated. For larger projects requiring substantially larger amounts of funding, non-primary entitlement and discretionary grants are often combined. Other types of FAA funding include facilities & equipment (F&E) projects and Congressionally-appropriated dollars for specific projects.

The FAA will not generally participate in vehicle parking, utilities, building renovations or projects associated with non-aviation developments. Some changes in funding levels and project eligibility were included in the current Airport Improvement Program (AIP) legislation (extends through FY 2007). Projects such as hangar construction or fuel systems, which have not traditionally been eligible for funding, are currently eligible, although the FAA indicates that this category of project would be considered to be a lower priority than other airfield needs. In addition, FAA funding levels have been increased from 90 percent to 95 percent, although the FAA indicates that a return to the previous 90 percent funding level may occur in future bills. Therefore, for planning purposes, FAA-eligible projects beyond 2007 are estimated based on a 90 percent level of FAA funding.

The constraints of AIP funding availability will dictate in large part, the actual schedule for completing airport improvement projects through the planning period. As a result, some projects included in the twenty-year CIP may be deferred beyond the twenty-year time frame.

State Funding

The Washington State Department of Transportation - Aviation Division (WSDOT - Aviation) provides an additional source of funding for airport projects. These can take the form of state grants through the Airport Aid Grants program. WSDOT- Aviation has established new grant criteria that requires that airport sponsors, when requesting aid, define projects related to pavement, safety, maintenance, security improvements or planning. The current grant program has a maximum award of $250,000, although significantly smaller grant amounts are common due to the large number of applications and the limited resources available to distribute on an annual or biennial basis.

WSDOT – Aviation also sponsors an Airport Pavement Management Program, which assesses the relative condition of pavements throughout the state's airport system. This program assists both the state and the airport sponsor to identify deficiencies and make programming decisions about pavement maintenance and repair. Maintaining airfield pavements is identified among the Aviation Division's highest investment priorities.

Estimating the potential level of state funding for the BVS capital improvement program is not possible, since funding is determined on a case-by-case basis. Competition among Washington airports for the limited grants funds is consistently high, with a priority generally given to airports with limited resources or airports that are not eligible to receive FAA grants. It is recommended that the Port continue to apply for WSDOT – Aviation funding whenever possible, in particular to assist with non-FAA eligible projects or to help in providing local match dollars for FAA grants.

Local Funding

The local match required for AIP-eligible projects is currently 5 percent of the total project development costs. Non-eligible capital improvements require 100 percent of the development costs with no federal participation. Depending on the specific facility need and planned improvements taking place at BVS, a significant portion of the funds necessary for accommodating future aviation demand will require local-only funding participation.

As currently defined, the locally funded portion of the short & long term twenty year CIP is estimated to be just under $3.4 million (approximately 12.7 percent), which includes the local match for AIP-funded projects, and the full cost of non-eligible projects. Hangar construction costs (T-hangars only) have been included in the CIP as an AIP-eligible item.

AIRPORT REVENUE AND EXPENSE PROJECTIONS

The Port of Skagit manages Skagit Regional Airport as an operating division within its overall administration structure. The airport and associated industrial park currently have six staff assigned to operations and maintenance, plus temporary summer help, accounting for 6 full time equivalent (FTE) positions. Port senior administrative staff and support staff are used on an as-needed basis for airport-related activities. The Port indicates that existing staffing levels appear to be adequate based on the current activity and facility needs. For financial planning purposes, the staffing level budgeted for fiscal year 2006 will be used as a baseline from which future projections will be made.

As noted in **Table 6-4**, airport operations are currently running a deficit of approximately $135,000 per year, before depreciation. The Port's stated goal is to bring airport operations to a breakeven financial position as soon as possible. Based on the planned construction of three Port-owned T-hangars and growth in other revenue-generating activities, combined with continued control of maintenance and operating expenses, the projections indicate that airport operations will be able to reach the breakeven position within the current 20-year planning period. It should be noted that the projections do not include depreciation or capital expenses, which are calculated separately. Additional information about the assumptions used in the revenue and expense projections is provided below.

Operating Revenues

The airport has three primary revenue categories: User Charges, Land Leases, and Buildings & Facilities. The Port indicates that the current rates and fees structure is generally in line with market rates at other general aviation airports in the region. For the purposes of projecting future revenues, it is assumed that revenues will increase at an average of 4 percent annually, through the 20-year planning period. This rate assumes both an increase in revenue-producing activities (new leases, etc.) and periodic increases in current rates and fees to account for inflation and market conditions.

In addition to the overall growth in revenues, the projection includes the introduction of three new revenue streams during the planning period. In response to anticipated market demand, the Port plans to construct three additional T-hangars during the planning period, each contributing approximately $34,000 per year (in 2005 dollars) in additional revenue. The associated increases in building & facilities revenues are projected in 2008, 2010, and 2012 based on the currently anticipated construction schedules.

Operating Expenses

As noted above, the current level of maintenance and operating expenses is considered to be reasonable based on expansive size of the facility and reflects the efficient use of staff and outside resources. Included within the airports outside services expense is the cost of contract security patrols that occur during the hours when the airport is not staffed.

It is anticipated that airport operating and maintenance expenses will generally increase at a rate slightly higher than inflation to reflect both normal cost increases and nominal increases in expenses that would be attributed to increased activity (leasing, airfield operations, security, etc.). Additional maintenance expenses are also anticipated as the airfield continues to expand physically. As noted in the facility requirements chapter, BVS has approximately 2.75 million square feet of airfield pavement (runways, taxiways, aircraft apron). Although the precise staging of facility expansion will depend on the availability of funding and actual market demand, the new facilities identified in the 20-year CIP (Infield parallel taxiway for Runway 10/28; new taxiways and taxilanes to serve new landside facilities, etc.) will increase the airfield pavement area by nearly 15 percent. The costs of maintaining the airfield can be reasonably expected to increase incrementally as the facility expands. For planning purposes, a one-time across the board 15% increase in all maintenance and operating expense categories has been added near the mid-point of the planning period (2015) to reflect both near term and longer term facility expansion.

Based on the assumptions outlined above, it is projected that airport operations for the Port of Skagit will reach a breakeven position within the current planning period. As the airport's financial operating position improves, its contribution toward overall capital costs will also improve.

Project Phasing

A project phasing diagram (**Figure 6-1**) has been prepared that corresponds to the projects listed in the 20-year capital improvement program.

TABLE 6-4: 20-YEAR OPERATING REVENUE AND EXPENSE PROJECTIONS

	Estimated 2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Operating Revenues												
User Charges	$9,740	$10,130	$10,535	$10,956	$11,394	$11,850	$12,324	$12,817	$13,330	$13,863	$14,418	$14,994
Land Leases	$57,000	$59,280	$61,651	$64,117	$66,682	$69,349	$72,123	$75,008	$78,008	$81,129	$84,374	$87,749
Buildings & Facilities	$179,190	$186,358	$193,812	$201,564	$243,827	$253,580	$297,923	$309,840	$356,434	$370,691	$385,519	$400,940
Subtotal - Operating Revenues	$245,930	$255,767	$265,998	$276,638	$321,903	$334,779	$382,371	$397,665	$447,772	$465,683	$484,310	$503,683
Operating Expenses												
Salaries/Wages	$142,500	$146,063	$122,878	$125,950	$129,099	$132,326	$135,634	$139,025	$142,501	$146,063	$149,715	$172,172
Benefits	$36,750	$37,669	$51,736	$53,029	$54,355	$55,714	$57,107	$58,535	$59,998	$61,498	$63,035	$72,491
Outside Services	$70,000	$71,750	$73,544	$75,382	$77,267	$79,199	$81,179	$83,208	$85,288	$87,420	$89,606	$103,047
Supplies	$9,000	$9,225	$9,456	$9,692	$9,934	$10,183	$10,437	$10,698	$10,966	$11,240	$11,521	$13,249
Equipment	$15,750	$16,144	$16,547	$16,961	$17,385	$17,820	$18,265	$18,722	$19,190	$19,670	$20,161	$23,186
Facilities	$7,500	$7,688	$7,880	$8,077	$8,279	$8,486	$8,698	$8,915	$9,138	$9,366	$9,601	$11,041
General & Administrative	$50,000	$51,250	$52,531	$53,845	$55,191	$56,570	$57,985	$59,434	$60,920	$62,443	$64,004	$73,605
Utilities	$33,699	$34,541	$35,405	$36,290	$37,197	$38,127	$39,081	$40,058	$41,059	$42,085	$43,138	$49,608
Other	$14,800	$15,170	$15,549	$15,938	$16,336	$16,745	$17,163	$17,593	$18,032	$18,483	$18,945	$21,787
Subtotal Operating Expenses (Before Depreciation)	$379,999	$389,499	$385,526	$395,164	$405,043	$415,169	$425,548	$436,187	$447,092	$458,269	$469,726	$540,185
Operating Income/(Loss) Before Depreciation	**($134,069)**	**($133,732)**	**($119,528)**	**($118,526)**	**($83,140)**	**($80,390)**	**($43,178)**	**($38,522)**	**$680**	**$7,414**	**$14,584**	**($36,502)**

Assumptions:

2004 Base Year; 2006 Staffing Budget Data provided by Port of Skagit

Revenues Increase at 4% per year; Port-constructed 10-unit T-hangar revenue added in 2008, 2010, and 2012 (estimated at $34,200 income per building per year based on with 95% average occupancy at $300 per month per unit rental rate)

Expenses Increase at 2.5% per year; one time 15% increase added in 2015 for increased cost of maintaining new pavements and facilities.

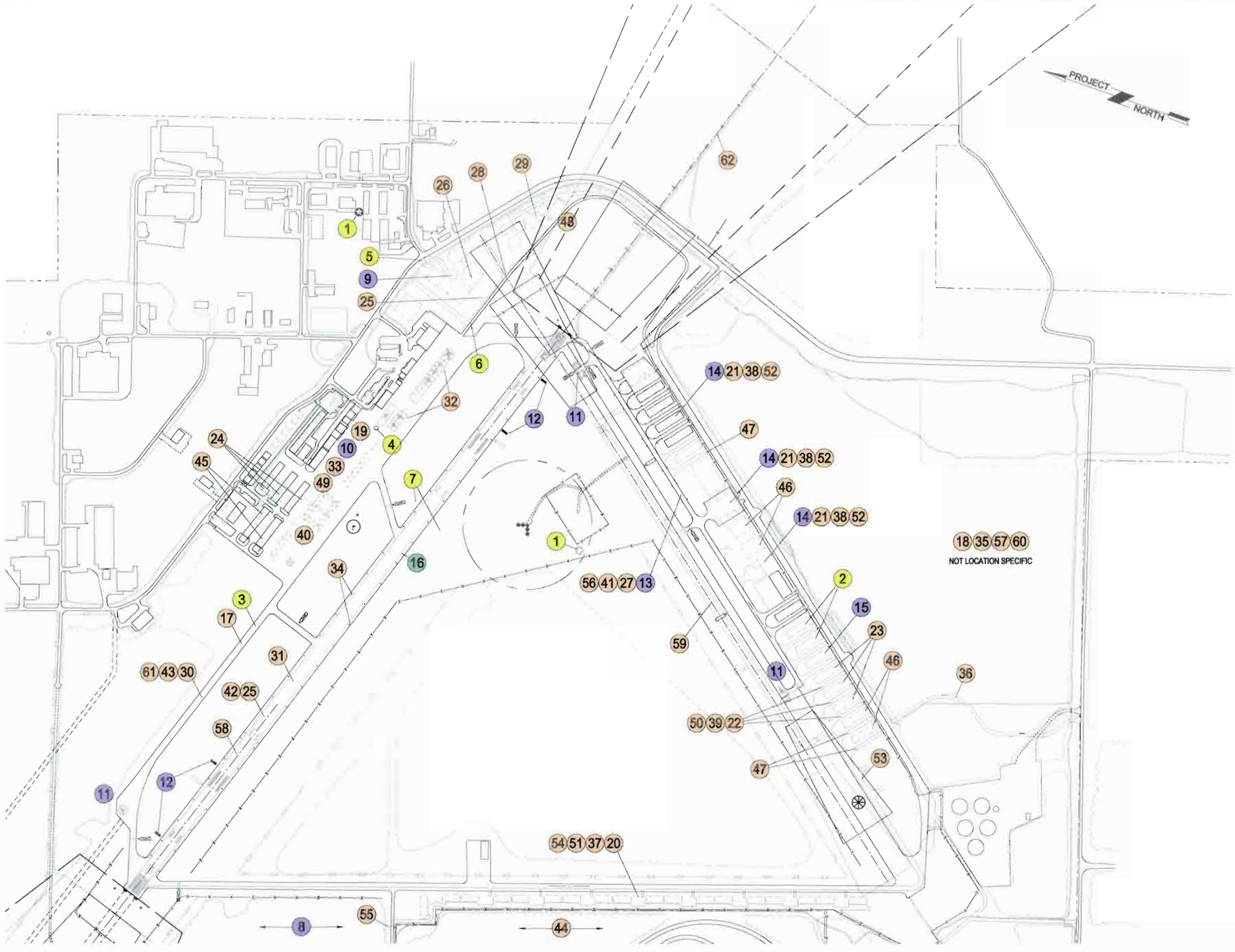
	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Operating Revenues											
User Charges	$15,594	$16,218	$16,867	$17,541	$18,243	$18,973	$19,731	$20,521	$21,342	$22,195	$23,083
Land Leases	$91,259	$94,909	$98,706	$102,654	$106,760	$111,030	$115,472	$120,090	$124,894	$129,890	$135,085
Buildings & Facilities	$416,977	$433,656	$451,002	$469,043	$487,804	$507,316	$527,609	$548,713	$570,662	$593,488	$617,228
Subtotal - Operating Revenues	$523,830	$544,783	$566,575	$589,237	$612,807	$637,319	$662,812	$689,325	$716,898	$745,573	$775,396
Operating Expenses											
Salaries/Wages	$176,476	$180,888	$185,411	$190,046	$194,797	$199,667	$204,659	$209,775	$215,019	$220,395	$225,905
Benefits	$74,303	$76,160	$78,064	$80,016	$82,016	$84,067	$86,169	$88,323	$90,531	$92,794	$95,114
Outside Services	$105,623	$108,264	$110,970	$113,744	$116,588	$119,503	$122,490	$125,553	$128,691	$131,909	$135,206
Supplies	$13,580	$13,920	$14,268	$14,624	$14,990	$15,365	$15,749	$16,142	$16,546	$16,960	$17,384
Equipment	$23,765	$24,359	$24,968	$25,592	$26,232	$26,888	$27,560	$28,249	$28,956	$29,679	$30,421
Facilities	$11,317	$11,600	$11,890	$12,187	$12,492	$12,804	$13,124	$13,452	$13,788	$14,133	$14,486
General & Administrative	$75,445	$77,331	$79,264	$81,246	$83,277	$85,359	$87,493	$89,680	$91,922	$94,220	$96,576
Utilities	$50,848	$52,120	$53,423	$54,758	$56,127	$57,530	$58,969	$60,443	$61,954	$63,503	$65,090
Other	$22,332	$22,890	$23,462	$24,049	$24,650	$25,266	$25,898	$26,545	$27,209	$27,889	$28,586
Subtotal Operating Expenses (Before Depreciation)	$553,689	$567,532	$581,720	$596,263	$611,169	$626,449	$642,110	$658,163	$674,617	$691,482	$708,769
Operating Income/(Loss) Before Depreciation	**($29,859)**	**($22,748)**	**($15,145)**	**($7,025)**	**$1,637**	**$10,871**	**$20,702**	**$31,162**	**$42,281**	**$54,091**	**$66,627**

Assumptions:

2004 Base Year; 2006 Staffing Budget Data provided by Port of Skagit

Revenues Increase at 4% per year; Port-constructed 10-unit T-hangar revenue added in 2008, 2010, and 2012 (estimated at $34,200 income per building per year based on with 95% average occupancy at $300 per month per unit rental rate)

Expenses Increase at 2.5% per year; one time 15% increase added in 2015 for increased cost of maintaining new pavements and facilities.



YEAR 2008	
1	Relocate Rotating Beacon
2	Construct Hangars & Taxilanes (2)
3	Taxiway A Fog Seal w/ New Markings
4	Underground Fuel Storage Tank Removal
5	Lot 72 Vehicular Access Road from Higgins Airport Way
6	Terminal Apron and Taxiway A Expansion (Lot 72)
7	Runway 10/28 Safety Area Compaction

YEAR 2009	
8	Security Improvements (Taxiway F to Taxiway A)
9	Security Improvements (Locking Ped Gates and Security Fencing Lot 72)
10	Terminal Apron Area Fog Seal w/ New Markings and Parking Positions
11	Relocate Runway 04 & 22 Thresholds; Reconfigure Taxiway Connections & AC Hold Areas, Lighting, Signage; Relocate PAPIs; Demo pavement beyond Relocated Rwy 22 Threshold; Extend Taxiway G to Rwy 4 End; Fog Seal; Repaint; Relocate Compass Rose (To New AC Holding Area Adjacent to Rwy 10)
12	Runway 10/28 PAPI
13	Taxiway G Fog Seal w/ New Markings
14	Rwy 04/22 Taxilanes/Cargo Apron/Fueling Apron Fog Seal
15	Construct Hangar & Taxilane (1)

YEAR 2010	
16	Runway 10/28 Repair/Rehabilitation (Maintenance Overlay); Repaint NPI/PIR Mkgs.

LONG TERM	
17	Taxiway A Overlay (2011)
18	Obstruction Removal (2011)
19	Terminal Apron Partial Overlay and Seal Coat (2012)
20	Taxiway F Overlay (2013)
21	Rwy 04/22 Taxilanes/Cargo Apron/Fueling Apron Slurry Seal (2013)
22	Construct (3) Taxilanes for T-Hangars (A,B,C) - 2013
23	Replace Port-Owned T-Hangars (A,B,C) - 2013
24	Demo Existing T-Hangars (A,B,C) Rwy 10/28 Flightline (2013)
25	Rwy 10/28 Flightline Redevelopment (west end) Apron (2014)
26	Rwy 10/28 Flightline Redevelopment (west end) Access Road & Utilities (2014)
27	Taxiway G Overlay (2014)
28	Rwy 10/28 Flightline Redevelopment (east end) Apron (2015)
29	Rwy 10/28 Flightline Redevelopment (east end) Access Road & Utilities (2015)
30	Taxiway A Fog Seal (2015)
31	Runway 10/28 Fog Seal w/ NPI/PIR Markings (2015)
32	Pavement Strengthening for Terminal Apron Large Aircraft Parking Positions (2016)
33	Terminal Apron Fog Seal (2017)
34	Runway 10/28 Lighting Reconstruction (2017)
35	Closed Circuit Video System (2017)
36	Construct Secondary Ovenell Road Access (2017)
37	Taxiway F Fog Seal (2018)
38	Rwy 04/22 Taxilanes/Cargo Apron/Fueling Apron Fog Seal (2018)
39	Taxilanes for T-Hangars (A,B,C) Fog Seal (2018)
40	Terminal Apron Floodlighting (2018)
41	Taxiway G Fog Seal (2019)
42	Runway 10/28 Slurry Seal w/ PIR Markings (2020)
43	Taxiway A Slurry Seal (2020)
44	Taxiway F Utility Development and Access Road (2020)
45	Demo Existing T-Hangars (D,E) Rwy 10/28 Flightline (2015) (2021)
46	Replace Port owned T-Hangars (D,E) - (2021)
47	Construct Taxilanes for T-Hangars (D,E) - (2021)
48	Helicopter Parking Area (2021)
49	Terminal Apron Slurry Seal (2022)
50	Taxilanes for T-Hangars (A,B,C) Slurry Seal (2023)
51	Taxiway F Slurry Seal (2023)
52	Rwy 04/22 Taxilanes/Cargo Apron/Fueling Apron Slurry Seal (2023)
53	Taxiway G Extension (2023)
54	Narrow Taxiway F to 35 Feet w/ New Markings (2023)
55	Taxiway F - Bayview Road Automated Gate (2023)
56	Taxiway G Slurry Seal (2024)
57	Environmental Assessment for Rwy 4/22 Lateral Shift (2024)
58	Runway10/28 Slurry Seal (2025) w/ PIR Markings
59	Relocate Runway 04/22 90 Feet (Construct New Runway 3,000'X60'); Extend Taxiway Connections to Taxiway G. (2025)
60	ALP Update (2025)
61	Taxiway A Fog Seal (2025)
62	MALSR Approach Lighting System (2025)

0 400 800 1200

SCALE IN FEET

SOURCE: USGS GEOMAG, SEPTEMBER 2005

PORT OF SKAGIT COUNTY

Century West ENGINEERING CORPORATION

DAVID EVANS AND ASSOCIATES INC.

IMPROVEMENT PHASING DIAGRAM

SKAGIT REGIONAL AIRPORT AIRPORT MASTER PLAN

FIGURE 6-1

Chapter Seven

Airport Layout Plan Drawings

CHAPTER SEVEN
AIRPORT LAYOUT PLAN DRAWINGS

INTRODUCTION

AIRPORT LAYOUT PLAN DRAWINGS

The options that were considered for the long-term development of Skagit Regional Airport resulted in the selection of a preferred alternative. The preferred alternative has been incorporated into the airport layout plan drawings, which are depicted in this chapter. The set of airport plans, which is referred to in aggregate as the "Airport Layout Plan" (ALP) has been prepared in accordance with FAA guidelines. The drawings illustrate existing conditions, recommended changes in airfield facilities, existing and recommended property ownership, land use, and obstruction removal. The ALP set is presented at the end of this chapter:

- *Sheet 1 - Data Sheet*
- *Sheet 2 – Airport Layout Plan*
- *Sheet 3 – FAR Part 77 Airspace Plan with Rwy 10 approach*
- *Sheet 4 – FAR Part 77 Airspace Plan with Rwy 28 approach*
- *Sheet 5 – Runway 10-28 Approach Surface Profile*
- *Sheet 6 – Runway 4-22 Approach Surface Profile*
- *Sheet 7 – Terminal Area Plan*
- *Sheet 8– Runway 10-28 RPZ Plan and Profile*
- *Sheet 9– Runway 4-22 RPZ Plan and Profile*
- *Sheet 10– Airport Land Use Plan with 2025 Noise Contours*
- *Sheet 11 – Airport Property Plan (Exhibit A)*

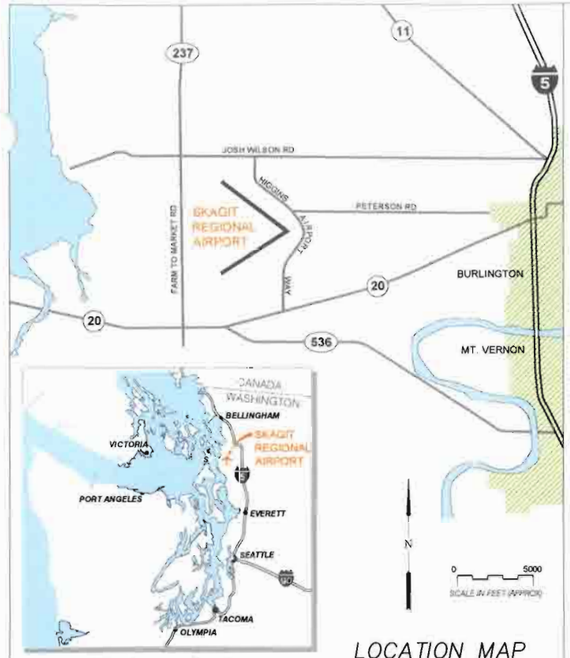
SKAGIT REGIONAL AIRPORT
Port of Skagit County
Washington

AIRPORT MASTER PLAN UPDATE

November 2006

CENTURY WEST ENGINEERING CORPORATION

DAVID EVANS AND ASSOCIATES INC.

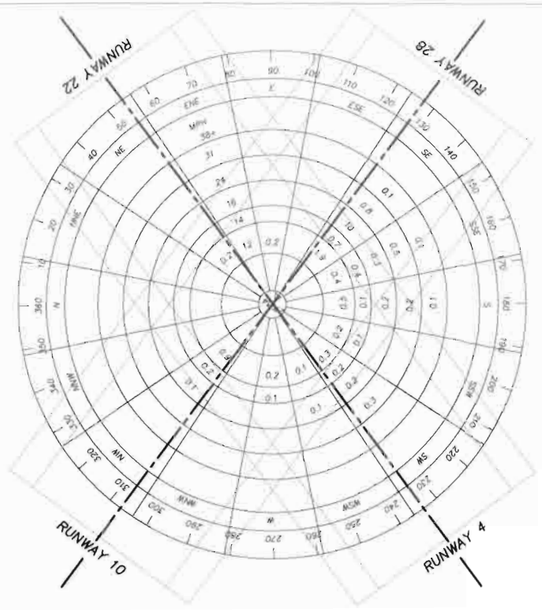


VICINITY MAP (NTS)

LOCATION MAP

NOTES:

1. FUTURE RUNWAY 4/22 DATA CORRESPONDS TO NEW RUNWAY.
2. EXISTING VISUAL RUNWAY 10/28 MARKINGS SHOULD BE UPGRADED TO NPI BASED ON EXISTING INSTRUMENT APPROACH CAPABILITIES. F 3/4 MILE. FUTURE 10/28 MARKINGS WILL BE PRECISION.
3. EXISTING RUNWAY END COORDINATES SOURCE IS 2002 WSDOT - AVIATION DIVISION FIELD SURVEY. EXISTING RUNWAY END ELEVATION SURVEYED (1999 NOS OBSTRUCTION CHART). FUTURE COORDINATES AND ELEVATIONS ESTIMATED WHERE CHANGED BY RUNWAY CONFIGURATION.
4. EXISTING RUNWAY 4/22 END COORDINATES AND ELEVATIONS SURVEYED (1999 NOS OBSTRUCTION CHART).
5. RUNWAY PAVEMENT STRENGTH ESTIMATED TO INCREASE TO APPROXIMATELY 30,000# SW/55,000# DW FOLLOWING REPAIR PROJECT PLANNED FOR 2006. LONG TERM INCREASE TO 75,000# DW BASED ON FUTURE DESIGN AIRCRAFT.
6. DATUM FOR ALL ITEMS LISTED IS NAD 83/NGVD 88.
7. DATA SOURCE FOR RUNWAY ELEVATIONS AND LATITUDE/LONGITUDE IS NOAA OBSTRUCTION CHART OC 6147 PUBLISHED 1999.
8. UNLESS OTHERWISE NOTED, ALL "EXISTING" FACILITY DIMENSIONS MEET PRESCRIBED FAA STANDARD.
9. FUTURE APPROACH VISIBILITY MINIMUMS FOR RUNWAYS 10 AND 28 ARE < 3/4 MILE, ASSUMING CAPABILITIES COMPARABLE TO CATEGORY I ILS WITH MALS-R APPROACH LIGHT SYSTEM. PLANNED WAAS (LPV) APPROACH FOR RUNWAY 10/28 PROVIDE 1-MILE VISIBILITY MINIMUMS AND HEIGHT ABOVE THRESHOLD (HAT) OF 343' AGL DUE TO EXISTING TREE PENETRATIONS.
10. ACTUAL CLEAR SLOPES ESTIMATED BASED ON REVIEW OF NOS SURVEY (1999).
11. ITEMS LOCATED WITHIN OFZ TO BE REMOVED - SEE OBSTRUCTION TABLE ON SHEETS 3 AND 4 FOR DETAILED DISPOSITION FOR ITEMS WITHIN PRIMARY SURFACE, WHICH ENCOMPASSES OFZ.



ALL WEATHER WIND ROSE

WIND COVERAGE (PERCENT)

	12 MPH OR LESS CROSS WIND	15 MPH OR LESS CROSS WIND
RUNWAY 10/28	98.9	99.39
RUNWAY 4/22	95.6	97.70

BASIC WIND DATA FROM U.S. DEPARTMENT OF COMMERCE NATIONAL WEATHER RECORDS CENTER, ASHVILLE N.C. OBSERVATIONS COVERING PERIOD JULY 1948 - JUNE 1951 AT MT. VERNON, WASHINGTON

DECLARED DISTANCES

EXISTING			EXISTING		
	RW 10	RW 28		RW 4	RW 22
LDA	5477	5477	LDA	3000	3000
ASDA	5477	5477	ASDA	3000	3000
TORA	5477	5477	TORA	3000	3000
TODA	5477	5477	TODA	3000	3000
FUTURE			FUTURE		
	RW 10	RW 28		RW 4	RW 22
LDA	5477	5477	LDA	3000	3000
ASDA	5477	5477	ASDA	3000	3000
TORA	5477	5477	TORA	3000	3000
TODA	5477	5477	TODA	3000	3000

MODIFICATIONS TO STANDARDS

	DESCRIPTION	RECOMMENDED ACTION
1.	RUNWAY 4-22 - PARALLEL TAXIWAY SEPARATION. EXISTING SEPARATION OF 150 FEET DOES NOT MEET ADG II STANDARD OF 240 FEET.	RELOCATE/RECONSTRUCT RUNWAY BY SHIFTING RUNWAY AT LEAST 90 FEET TO MEET ADG II PARALLEL TAXIWAY SEPARATION STANDARD.
2.	3 TIEDOWNS NEAR WEST END OF RUNWAY 10-28 FLIGHTLINE LOCATED WITHIN TAXIWAY A OFA.	REMOVE TIEDOWNS AS PART OF RECONFIGURATION.
3.	OVERHEAD LIGHT POLES LOCATED WITHIN TAXILANE OBJECT FREE AREA IN NORTH T-HANGAR AREA.	INSTALL REFLECTIVE MARKINGS ON POLES; TAXIWAY CONFIGURATION AND POLES; THIS NONSTANDARD CONDITION SHALL BE REEVALUATED AS PART OF FUTURE DEVELOPMENT, PER AIRPORT LAYOUT PLAN
4.	ITEMS (FENCES, TREES, BUSHES, ETC.) LOCATED WITHIN OFZ (SEE NOTE 11).	REMOVE ITEMS LOCATED WITH OFZ PER FAA STANDARD.

AIRPORT DATA TABLE

DESCRIPTION	EXISTING	FUTURE
AIRPORT ELEVATION	143.8'	SAME
AIRPORT ACREAGE	1855	1855
ARP COORDINATES	LAT. N 48° 28' 15.2" LONG. W 122° 25' 15.1"	LAT. N 48° 28' 14.6" LONG. W 122° 25' 17.2"
MAGNETIC DECLINATION	18° 02'E SOURCE: 9/2005 NGDC	SAME
MEAN MAX. DAILY TEMPERATURE	75.1°	SAME
NDB COORDINATES		LAT. N 48° 28' 12" LONG. W 122° 25' 12"

	EXISTING CONDITIONS RUNWAY 10 - 28	FUTURE CONDITIONS RUNWAY 10 - 28	EXISTING CONDITIONS RUNWAY 4 - 22	FUTURE CONDITIONS RUNWAY 4 - 22
AIRPORT REFERENCE CODE (ARC)	B-II	D-II	B-I (SMALL)	B-I (SMALL)
FAR PART 77 DESIGNATION	LARGER THAN UTILITY NPI	LARGER THAN UTILITY PRECISION	UTILITY-VISUAL	SAME
NPIAS ROLE / SERVICE LEVEL	GENERAL AVIATION, GENERAL UTILITY	SAME	GENERAL AVIATION, BASIC UTILITY	SAME
TERMINAL NAVAIDS	NDB, BEACON	NDB, ILS, BEACON, WAAS (LPV)	NDB, BEACON	SAME
TAXIWAY LIGHTING	MITL	SAME	MITL	SAME
TAXIWAY MARKING	BASIC	SAME	BASIC	SAME

RUNWAY DATA TABLE

	EXISTING CONDITIONS	FUTURE CONDITIONS	EXISTING CONDITIONS	FUTURE CONDITIONS
RUNWAY IDENTIFICATION	RUNWAY 10 - 28	RUNWAY 10 - 28	RUNWAY 4 - 22	RUNWAY 4 - 22 (1)
RUNWAY PERCENT GRADIENT / MAXIMUM GRADE	0.86%	SAME	0.43%	0.38%
RUNWAY PERCENT WIND COVERAGE	99.47 (ASSUMED 15 MPH)	SAME	95.6 (ASSUMED 12 MPH)	SAME
RUNWAY PAVEMENT TYPE	ASPHALT	SAME	ASPHALT	SAME
RUNWAY PAVEMENT STRENGTH (IN 1000 LBS)	19 SWL (5)	75 DWL (5)	17 SWL	12.5 SWL
RUNWAY WIDTH AND LENGTH	100' X 5477'	SAME	60' X 3000'	SAME

	EXISTING CONDITIONS	EXISTING STANDARD	FUTURE CONDITIONS	EXISTING CONDITIONS	EXISTING STANDARD	FUTURE CONDITIONS
RUNWAY SAFETY AREA WIDTH AND LENGTH LENGTH BEYOND RUNWAY END	150' X 6077' 300'	150' X 6077' 300'	500' x 7477' 1000'	120' x 3480' 240'	120' x 3480' 240'	120' x 3480' 240'
OBJECT FREE AREA WIDTH AND LENGTH LENGTH BEYOND RUNWAY END	500' x 6077' 300'	500' x 6077' 300'	800' x 7477' 1000'	250' x 3480' 240'	250' x 3480' 240'	250' x 3480' 240'
OBSTACLE FREE ZONE WIDTH AND LENGTH LENGTH BEYOND RUNWAY END	400' x 5877' 200'	400' x 5877' 200'	400' x 5877' 200'	250' x 3400' 200'	250' x 3400' 200'	250' x 3400' 200'

	EXISTING CONDITIONS		FUTURE CONDITIONS		EXISTING CONDITIONS		FUTURE CONDITIONS	
RUNWAY LIGHTING	MIRL		SAME		MIRL		SAME	
RUNWAY END	10	28	10	28	4	22	4	22
RUNWAY APPROACH CATEGORY	NON-PRECISION	NON-PRECISION	PRECISION	PRECISION	VISUAL	VISUAL	VISUAL	VISUAL
RUNWAY APPROACH SLOPE PART 77 REQUIRED	34:1	34:1	50:1	50:1	20:1	20:1	20:1	20:1
(10) ACTUAL	7:1	30:1	50:1	50:1	11:1	20:1	20:1	20:1
APPROACH VISIBILITY MINIMUMS	NON-PRECISION ≥ 3/4 MILE	NON-PRECISION ≥ 3/4 MILE	PRECISION (9) < 3/4 MILE	PRECISION (9) < 3/4 MILE	VISUAL OR CIRCLING ≥ 1 MILE	VISUAL OR CIRCLING ≥ 1 MILE	SAME	SAME
RUNWAY MARKINGS	VISUAL [2]	VISUAL [2]	PRECISION	PRECISION	VISUAL	VISUAL	SAME	SAME
RUNWAY END COORDINATES (3) LAT.	N 48° 28'40.24"	N 48° 28'08.13"	SAME	SAME	N 48°27'50.62	N 48°28'06.99"	N 48°27'49.04"	N 48°28'05.41"
LONG.	W 122° 25'51.33"	W 122° 24'45.94"	SAME	SAME	W 122°25'27.21"	W 124°24'50.11"	W 122°25'33.21"	W 122°24'56.11"
INSTRUMENTATION AND APPROACH AIDS	NDB, GPS	GPS	MALSR, WAAS	MALSR, WAAS	NONE	NONE	NONE	NONE
VISUAL AIDS	VASI-4 (FAA OWNED), REILS	VASI-2 (PORT OWNED), REILS	PAPI	PAPI	PAPI	PAPI	PAPI	PAPI
CRITICAL AIRCRAFT (ARC)	B-II (CITATION II, TYP)		D-II (GULFSTREAM IV, TYP)		B-I SMALL (CESSNA 172, TYP)		SAME	
WINGSPAN	LESS THAN 79'		LESS THAN 79'		LESS THAN 49'		LESS THAN 49'	
WEIGHT	MORE THAN 12,500 LBS		75,000 LBS OR LESS (5)		12,500 LBS OR LESS		12,500 LBS OR LESS	
APPROACH SPEED	91 TO LESS THAN 121 KNOTS		121 TO LESS THAN 141 KNOTS		LESS THAN 91 KNOTS		91 TO LESS THAN 121 KNOTS	
LENGTH OF HAUL	≤ 500 MILES		≤ 500 MILES		≤ 500 MILES		≤ 500 MILES	
OFZ PENETRATION (11)	YES		NONE		YES		NONE	

REVISIONS

#	By	Appr	Date	Revision

Date 11/06 Checked RMF
Drawn GPG Approved DMM

CENTURY WEST ENGINEERING CORPORATION
DAVID EVANS AND ASSOCIATES INC.

SKAGIT REGIONAL AIRPORT
Port of Skagit County, Washington

Sheet 1 of 11
AIRPORT DATA SHEET
NOVEMBER 2006

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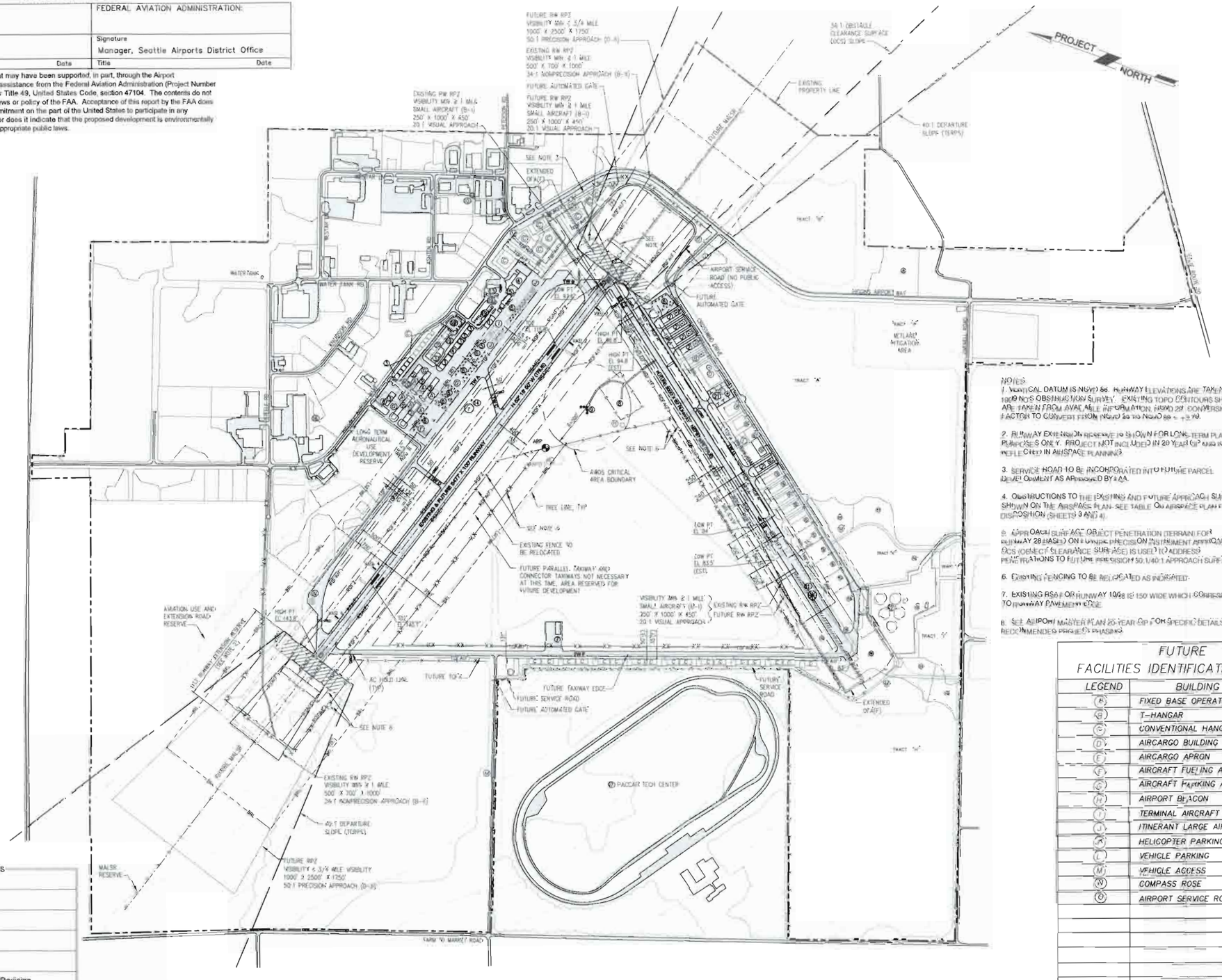
APPROVAL BLOCK

AIRPORT SPONSOR:	FEDERAL AVIATION ADMINISTRATION:
Signature	Signature Manager, Seattle Airports District Office
Title Date	Title Date

The preparation of this document may have been supported, in part, through the Airport Improvement Program financial assistance from the Federal Aviation Administration (Project Number 3-53-0010-12) as provided under Title 49, United States Code, section 47104. The contents do not necessarily reflect the official views or policy of the FAA. Acceptance of this report by the FAA does not in any way constitute a commitment on the part of this United States to participate in any development depicted therein nor does it indicate that the proposed development is environmentally acceptable in accordance with appropriate public laws.



NOTES:

1. VERTICAL DATUM IS NGVD 88. RUNWAY ELEVATIONS ARE TAKEN FROM 1989 NOS OBSTRUCTION SURVEY. EXISTING TOPO CONTOURS SHOWN ARE TAKEN FROM AVAILABLE INFORMATION. NGVD 29 CONVERSION FACTOR TO CONVERT FROM NGVD 29 TO NGVD 88 = +3.79.
2. RUNWAY EXTENSION RESERVE IS SHOWN FOR LONG-TERM PLANNING PURPOSES ONLY. PROJECT NOT INCLUDED IN 20 YEAR CIP AND IS NOT REFLECTED IN AIRSPACE PLANNING.
3. SERVICE ROAD TO BE INCORPORATED INTO FUTURE PARCEL DEVELOPMENT AS APPROVED BY FAA.
4. OBSTRUCTIONS TO THE EXISTING AND FUTURE APPROACH SURFACES SHOWN ON THE AIRSPACE PLAN. SEE TABLE ON AIRSPACE PLAN FOR DISPOSITION (SHEETS 3 AND 4).
5. APPROACH SURFACE OBJECT PENETRATION (TERRAIN) FOR RUNWAY 28 (BASED ON A UNIQUE PRECISION INSTRUMENT APPROACH OCS (OBJECT CLEARANCE SURFACE) IS USED TO ADDRESS PENETRATIONS TO FUTURE PRECISION 50:1/40:1 APPROACH SURFACE.
6. EXISTING FENCING TO BE RELOCATED AS INDICATED.
7. EXISTING RSA FOR RUNWAY 10/28 IS 150' WIDE WHICH CORRESPONDS TO RUNWAY PAVEMENT EDGE.
8. SEE AIRPORT MASTER PLAN 20-YEAR CIP FOR SPECIFIC DETAILS ON RECOMMENDED PROJECTS PHASING.

LEGEND

DESCRIPTION	EXISTING	FUTURE
AIRPORT PROPERTY LINE		
PAVEMENT		
EXISTING PAVEMENT TO BE REMOVED		
ON-AIRPORT BUILDING		
RUNWAY SAFETY AREA	RSA	RSA(F)
RUNWAY OBJECT FREE AREA	ROFA	ROFA(F)
TAXIWAY OBJECT FREE AREA	TOFA	TOFA(F)
RWY OBSTACLE FREE ZONE	ROFZ	ROFZ(F)
BLDG RESTRICTION LINE MAXIMUM HEIGHT SHOWN (X')	BRL (XX')	BRL (XX')
CONTOURS (SEE NOTE 1.)		
EXISTING PEDESTRIAN CIRCULATION SYSTEM		
PRINCIPAL DRAINAGE FEATURES		
HOLD SIGNS		
AC HOLD LINE		
PAPI'S		
POFZ (800' WIDE, 200' BEYOND RUNWAY END)		
AIRPORT REFERENCE POINT		
BEACON		
TREE LINE		
FENCE	X X X	XX XX
LEASE PLOT BOUNDARY		
LEASE PLOT IDENTIFICATION	(17)	(17)
HELICOPTER PARKING	H	H

FUTURE FACILITIES IDENTIFICATION TABLE

LEGEND	BUILDING USE
(A)	FIXED BASE OPERATOR
(B)	T-HANGAR
(C)	CONVENTIONAL HANGAR
(D)	AIRCARGO BUILDING
(E)	AIRCARGO APRON
(F)	AIRCRAFT FUELING AREA
(G)	AIRCRAFT PARKING AREA
(H)	AIRPORT BEACON
(I)	TERMINAL AIRCRAFT LOADING POSITIONS
(J)	ITINERANT LARGE AIRCRAFT PARKING
(K)	HELICOPTER PARKING
(L)	VEHICLE PARKING
(M)	VEHICLE ACCESS
(N)	COMPASS ROSE
(O)	AIRPORT SERVICE ROAD

EXISTING FACILITIES IDENTIFICATION TABLE

LEGEND	BUILDING USE
(1)	TERMINAL BUILDING
(2)	T-HANGAR
(3)	CONVENTIONAL HANGAR
(4)	FIXED BASE OPERATOR
(5)	AIRCRAFT FUELING AREA
(6)	AIRCRAFT PARKING AREA
(7)	TAXIWAY F HANGAR AND APRON
(8)	NONDIRECTIONAL BEACON (NDB)
(9)	AWOS
(10)	AIRPORT BEACON
(11)	COMPASS ROSE
(12)	FUEL FARM (NON-AVIATION)
(13)	MAINTENANCE FACILITY
(14)	SEGMENTED CIRCLE - WIND CONE
(15)	AIRPORT COMMERCIAL FACILITY
(16)	AIRPORT INDUSTRIAL PARK
(17)	PACCAR TECH CENTER
(18)	FIRE TRUCK STORAGE
(19)	VEHICLE PARKING
(20)	PUBLIC RESTROOMS
(21)	AIRCRAFT CARGO APRON

REVISIONS

#	By	Appr	Date	Revision

Date	11/06	Checked	RMK
Drawn	GPG	Approved	DMM

CENTURY WEST ENGINEERING CORPORATION — DAVID EVANS AND ASSOCIATES INC.

0 600 1200 1800
SCALE IN FEET

PROJECT 16°02' TRUE NORTH
SOURCE: USGS GEOMAG, SEPTEMBER 2006

SKAGIT REGIONAL AIRPORT
Port of Skagit County, Washington

SHEET 2 OF 11
AIRPORT LAYOUT PLAN
NOVEMBER 2006

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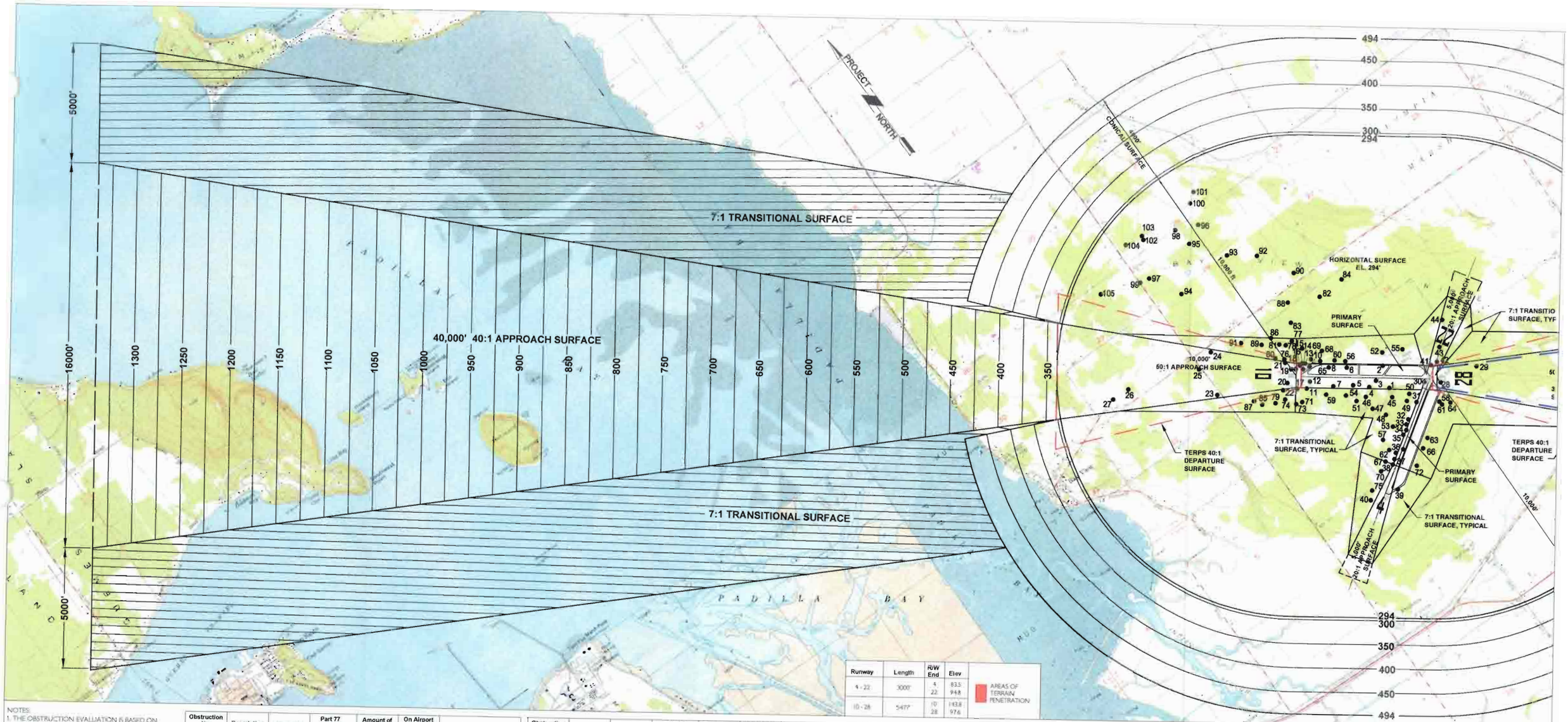


Runway	Length	R/W End	Elev
4 - 22	3000'	4	83.5
		22	94.8
10 - 28	5477'	10	143.8
		28	97.6

AREAS OF TERRAIN PENETRATION

NOTES:
1. THE OBSTRUCTION EVALUATION IS BASED ON REVIEW OF:
NOAA AIRPORT OBSTRUCTION CHART (SURVEY)
U.S.G.S. MAPS
PREVIOUS AIRSPACE PLANS.

2. THE DRAWING REFLECTS PLANNED CONFIGURATION SPECIFIC TO THIS AIRPORT AND IS NOT INTENDED TO BE USED AS A BASIS FOR NAVIGATION OR CONSTRUCTION.

3. VERTICAL DATUM NGVD88.

4. TREE HEIGHTS SHOULD BE CONSIDERED APPROXIMATE, DUE TO CONTINUED GROWTH.

REVISIONS

#	By	Appr	Date	Revision

Obstruction No.	Description	Elevation	Part 77 Surface	Amount of Penetration	On Airport Property?	Disposition
1	BUSH	124	TRANSITIONAL	8	YES	REMOVE
2	OL WINDSOCK	147	PRIMARY	28	YES	NONE; LOCATION FIXED BY FUNCTION
3	FENCE	126	PRIMARY	5	YES	REMOVE/RELOCATE
4	BUSH	136	PRIMARY	13	YES	REMOVE
5	TREE	160	PRIMARY	32	YES	REMOVE
6	GROUND	138	PRIMARY	6	YES	LOWER TERRAIN (GRADING)
7	TREE	171	PRIMARY	38	YES	REMOVE
8	GROUND	142	PRIMARY	6	YES	LOWER TERRAIN (GRADING)
9	FENCE	145	PRIMARY	3	YES	REMOVE/RELOCATE
10	ROD ON ELECTRICAL EQUIP.	151	PRIMARY	9	YES	NONE; LOCATION FIXED BY FUNCTION
11	TREE	193	TRANSITIONAL	51	YES	REMOVE/LOWER
12	FENCE	143	PRIMARY	0	YES	NO OBSTRUCTION – FOR REFERENCE ONLY
13	TREE	183	PRIMARY	40	YES	REMOVE
14	BUSH	156	PRIMARY	12	YES	REMOVE
15	TREE	193	TRANSITIONAL	49	YES	REMOVE/LOWER
16	TREE	183	PRIMARY	19	YES	REMOVE

Obstruction No.	Description	Elevation	Part 77 Surface	Amount of Penetration	On Airport Property?	Disposition
17	TREE	192	TRANSITIONAL	48	YES	REMOVE/LOWER
18	TREE	152	APPROACH (RWY10)	8	YES	REMOVE
19	FENCE	149	APPROACH (RWY10)	1	YES	REMOVE/RELOCATE
20	TREE	154	APPROACH (RWY10)	3	YES	REMOVE/LOWER
21	TREE	200	APPROACH (RWY10)	47	YES	REMOVE/LOWER
22	TREE	196	TRANSITIONAL	41	YES	REMOVE/LOWER
23	TREE	217	APPROACH (RWY10)	7'	NO	REMOVE/LOWER
24	TREE	258	APPROACH (RWY10)	43	YES	REMOVE/LOWER
25	TREE	262	APPROACH (RWY10)	37	NO	REMOVE/LOWER
26	TREE	283	APPROACH (RWY10)	-3	NO	NO OBSTRUCTION – FOR REFERENCE ONLY
27	ANTENNA ON SPIRE	301	APPROACH (RWY10)	-2	NO	NO OBSTRUCTION – FOR REFERENCE ONLY
28	BUSH	101	APPROACH (RWY28)	2	YES	REMOVE

Obstruction No.	Description	Elevation	Part 77 Surface	Amount of Penetration	On Airport Property?	Disposition
29	TREE	149	APPROACH (RWY 28)	20	YES	REMOVE/LOWER
30	WINDSOCK	111	APPROACH (RWY22)	7	YES	RELOCATE AS PART OF NEW RWY 4/22 CONSTRUCTION
31	BUSH	104	PRIMARY (4/22)	11	YES	REMOVE
32	BUSH	107	TRANSITIONAL (4/22)	10	YES	REMOVE
33	TREE	110	TRANSITIONAL (4/22)	12	YES	REMOVE
34	FENCE	91	PRIMARY (4/22)	2	YES	REMOVE/RELOCATE
35	BUSH	98	TRANSITIONAL (4/22)	6	YES	REMOVE
36	TREE	108	PRIMARY (4/22)	24	YES	REMOVE
37	FENCE	89	PRIMARY (4/22)	6	YES	REMOVE/RELOCATE
38	TREE	108	PRIMARY (4/22)	25	YES	REMOVE
39	TREE	170	TRANSITIONAL (4/22)	2	YES	REMOVE/LOWER

Obstruction No.	Description	Elevation	Part 77 Surface	Amount of Penetration	On Airport Property?	Disposition
40	TREE	213	TRANSITIONAL (4/22)	30	YES	REMOVE/LOWER
41	FENCE	107	PRIMARY (10/28)	10	YES	REMOVE/RELOCATE
42	FENCE	105	PRIMARY (10/28)	7	YES	REMOVE/RELOCATE
43	LIGHT POLE	137	APPROACH (22)	9	YES	NO OBSTRUCTION – FOR REFERENCE ONLY RECOMMEND OBSTRUCTION LIGHT DUE TO LOCATION OF POLE UNDER APPROACH SFC.
44	TREE	212	APPROACH (22)	9	YES	NO OBSTRUCTION – FOR REFERENCE ONLY RECOMMEND LOWERING/REMOVING DUE TO LOCATION UNDER APPROACH SFC.
45	TREE	224	TRANSITIONAL	51	YES	REMOVE/LOWER
46	TREE	240	TRANSITIONAL	69	YES	REMOVE/LOWER
47	TREE	248	TRANSITIONAL	4	YES	REMOVE/LOWER

Date 11/06 Checked RMK
Drawn GPG Approved DMM

CENTURY WEST ENGINEERING CORPORATION
DAVID EVANS AND ASSOCIATES INC.

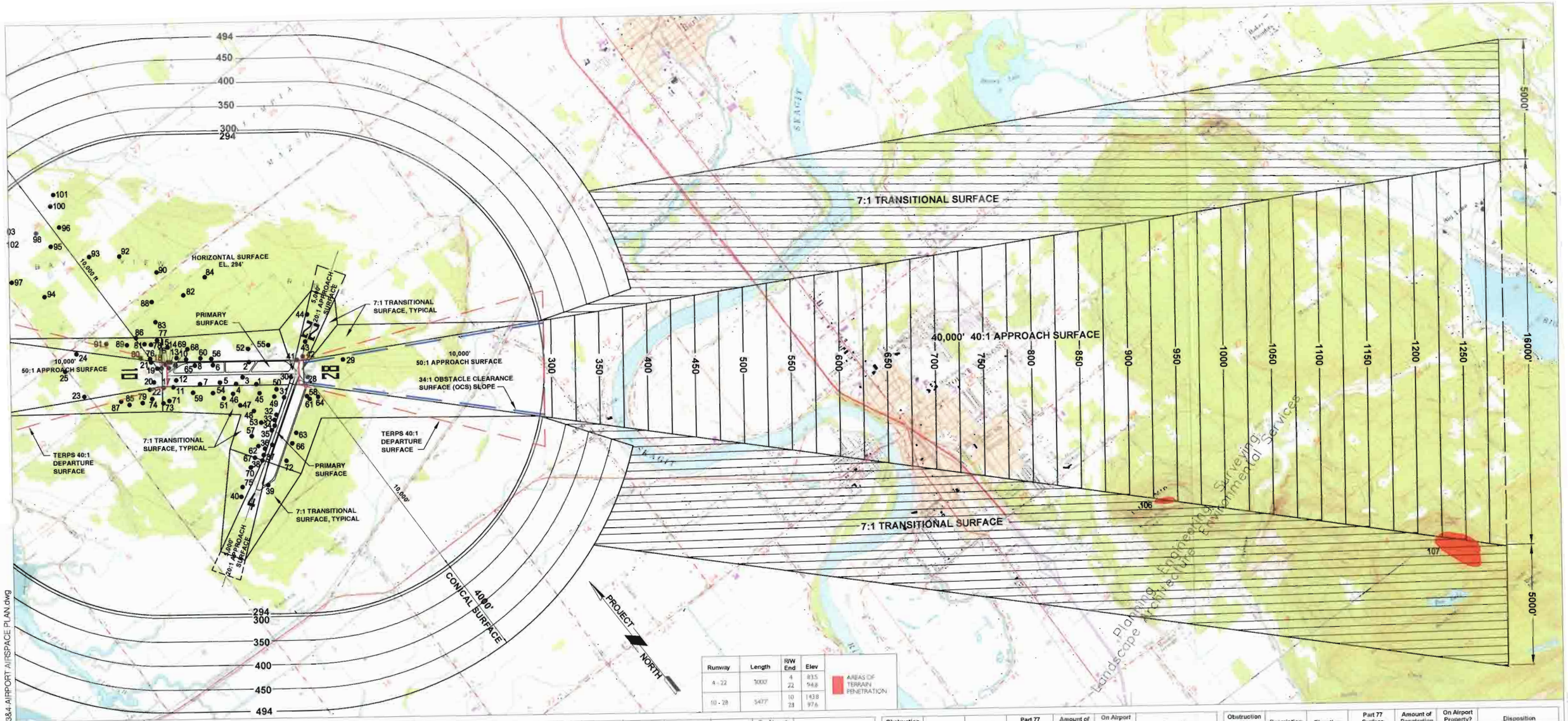
0 2000 4000 6000
SCALE IN FEET

PROJECT 18°02' TRUE NORTH

SOURCE: USGS GEOMAG, SEPTEMBER 2005

SKAGIT REGIONAL AIRPORT
Port of Skagit County, Washington

SHEET 3 OF 11
AIRPORT AIRSPACE PLAN
NOVEMBER 2006



Runway	Length	R/W End	Elev
4 - 22	3000'	4	835
		22	948
10 - 28	5477'	10	1438
		28	976

AREAS OF TERRAIN PENETRATION

NOTES:
1. THE OBSTRUCTION EVALUATION IS BASED ON REVIEW OF:
NOAA AIRPORT OBSTRUCTION CHART (SURVEY)
U.S.G.S. MAPS
PREVIOUS AIRSPACE PLANS.

2. THE DRAWING REFLECTS PLANNED CONFIGURATION SPECIFIC TO THIS AIRPORT AND IS NOT INTENDED TO BE USED AS A BASIS FOR NAVIGATION OR CONSTRUCTION.

3. VERTICAL DATUM NGVD88.

4. TREE HEIGHTS SHOULD BE CONSIDERED APPROXIMATE, DUE TO CONTINUED GROWTH.

REVISIONS

#	By	Appr	Date	Revision

Obstruction No.	Description	Elevation	Part 77 Surface	Amount of Penetration	On Airport Property?	Disposition
48	TREE	236	TRANSITIONAL (4/22)	12	YES	REMOVE/LOWER
49	OBST. LIGHT ON TOWER	158	TRANSITIONAL (4/22)	16	YES	NONE; LOCATION FIXED BY FUNCTION
50	OBST. LIGHT ON TOWER	159	TRANSITIONAL (4/22)	15	YES	NONE; LOCATION FIXED BY FUNCTION
51	TREE	268	TRANSITIONAL	68	YES	REMOVE/LOWER
52	RELOCATED AIRPORT BEACON (FUTURE)	N/A	TRANSITIONAL (4/22)	N/A	YES	NONE; LOCATION FIXED BY FUNCTION
53	TREE	208	TRANSITIONAL (4/22)	50	YES	REMOVE/LOWER
54	TREE	253	TRANSITIONAL	78	YES	REMOVE/LOWER
55	TREE	207	TRANSITIONAL	10	YES	REMOVE/LOWER
56	TREE*	229	TRANSITIONAL	81	YES	REMOVE/LOWER
57	TREE	226	TRANSITIONAL	43	YES	REMOVE/LOWER
58	TREE	200	TRANSITIONAL	13	YES	REMOVE/LOWER
59	TREE	249	TRANSITIONAL	69	YES	REMOVE/LOWER
60	TREE	244	TRANSITIONAL	68	YES	REMOVE/LOWER

Obstruction No.	Description	Elevation	Part 77 Surface	Amount of Penetration	On Airport Property?	Disposition
61	TREE	227	TRANSITIONAL	17	YES	REMOVE/LOWER
62	TREE	204	TRANSITIONAL	72	YES	REMOVE/LOWER
63	TREE	198	TRANSITIONAL	12	YES	REMOVE/LOWER
64	TREE	222	TRANSITIONAL	0	YES	NO OBSTRUCTION – FOR REFERENCE ONLY
65	TREE	218	TRANSITIONAL	63	YES	REMOVE/LOWER
66	TREE	210	TRANSITIONAL	29	YES	REMOVE/LOWER
67	TREE	203	TRANSITIONAL	70	YES	REMOVE/LOWER
68	TREE	303	TRANSITIONAL	67	YES	REMOVE/LOWER
69	TREE	289	TRANSITIONAL	100	YES	REMOVE/LOWER
70	TREE	178	TRANSITIONAL	35	YES	REMOVE/LOWER
71	TREE	268	TRANSITIONAL	41	YES	REMOVE/LOWER
72	TREE	201	TRANSITIONAL	13	YES	REMOVE/LOWER
73	TREE	270	TRANSITIONAL	29	YES	REMOVE/LOWER
74	TREE	257	TRANSITIONAL	39	YES	REMOVE/LOWER
75	TREE	196	TRANSITIONAL	16	YES	REMOVE/LOWER

Obstruction No.	Description	Elevation	Part 77 Surface	Amount of Penetration	On Airport Property?	Disposition
76	TREE	219	TRANSITIONAL	51	YES	REMOVE/LOWER
77	TREE	304	TRANSITIONAL	24	YES	REMOVE/LOWER
78	TREE	292	TRANSITIONAL	40	YES	REMOVE/LOWER
79	TREE	273	TRANSITIONAL	56	YES	REMOVE/LOWER
80	TREE	210	TRANSITIONAL	39	YES	REMOVE/LOWER
81	TREE	289	TRANSITIONAL	34	YES	REMOVE/LOWER
82	TREE	312	HORIZONTAL	18	YES	REMOVE/LOWER
83	TREE	323	HORIZONTAL	29	YES	REMOVE/LOWER
84	TREE	305	HORIZONTAL	11	YES	REMOVE/LOWER
85	TREE	287	TRANSITIONAL	19	YES	REMOVE/LOWER
86	TREE	298	TRANSITIONAL	4	YES	REMOVE/LOWER
87	TREE	261	TRANSITIONAL	33	YES	REMOVE/LOWER
88	TREE	326	HORIZONTAL	32	YES	REMOVE/LOWER
89	TREE	282	TRANSITIONAL	34	YES	REMOVE/LOWER
90	TREE	309	HORIZONTAL	15	YES	REMOVE/LOWER
91	TREE	265	TRANSITIONAL	11	YES	REMOVE/LOWER

Obstruction No.	Description	Elevation	Part 77 Surface	Amount of Penetration	On Airport Property?	Disposition
92	TREE	319	HORIZONTAL	25	NO	REMOVE/LOWER
93	TREE	310	HORIZONTAL	16	NO	REMOVE/LOWER
94	TREE	309	HORIZONTAL	15	NO	REMOVE/LOWER
95	TREE	354	HORIZONTAL	60	NO	REMOVE/LOWER
96	TREE	354	HORIZONTAL	60	NO	REMOVE/LOWER
97	TREE	331	HORIZONTAL	37	NO	REMOVE/LOWER
98	TREE	357	HORIZONTAL	64	NO	REMOVE/LOWER
99	TREE	328	HORIZONTAL	34	NO	REMOVE/LOWER
100	TREE	334	HORIZONTAL	40	NO	REMOVE/LOWER
101	TREE	333	HORIZONTAL	39	NO	REMOVE/LOWER
102	OBST. LIGHT ON TANK	302	HORIZONTAL	8	NO	REMOVE/LOWER
103	TREE	331	HORIZONTAL	37	NO	REMOVE/LOWER
104	TREE	325	HORIZONTAL	31	NO	REMOVE/LOWER
105	TREE	344	HORIZONTAL	50	NO	REMOVE/LOWER
106	TERRAIN	934	APPROACH (28)	101	NO	NONE
107	TERRAIN	1540	APPROACH (28)	300	NO	NONE

Date 11/06 Checked RMK
Drawn GPG Approved DMM

CENTURY WEST ENGINEERING CORPORATION
DAVID EVANS AND ASSOCIATES INC

0 2000 4000 6000
SCALE IN FEET

PROJECT 18°02' TRUE NORTH
SOURCE: USGS GEOMAG, SEPTEMBER 2005

SKAGIT REGIONAL AIRPORT
Port of Skagit County, Washington

SHEET 4 OF 11
AIRPORT AIRSPACE PLAN
NOVEMBER 2006

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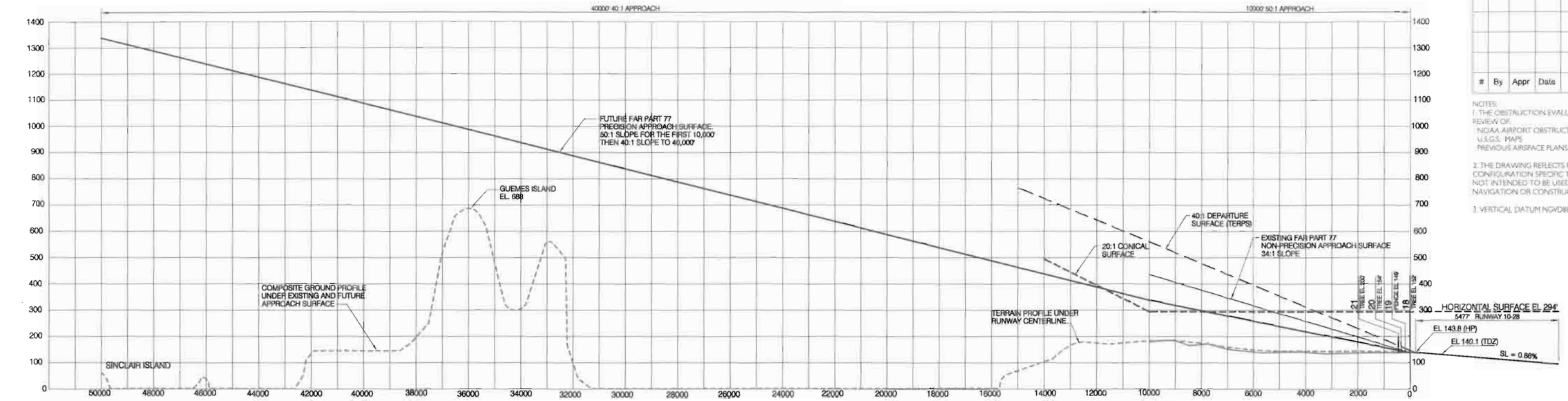
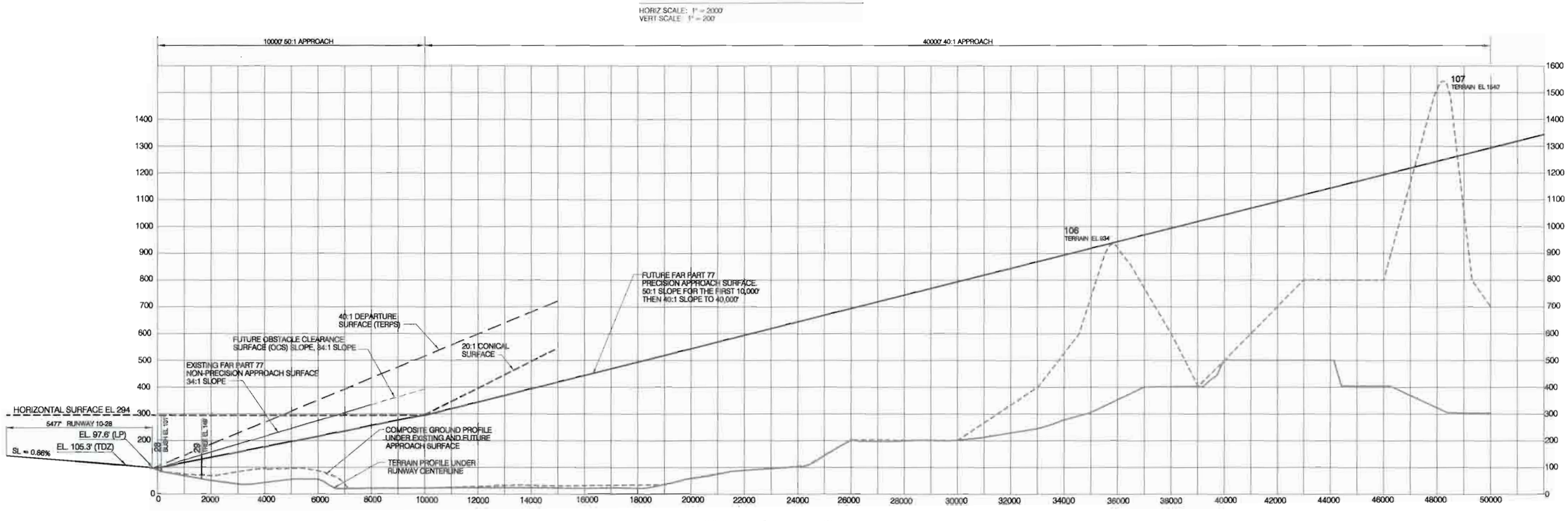


RUNWAY 10 APPROACH PROFILE

HORIZ SCALE: 1" = 2000'
VERT SCALE: 1" = 200'



RUNWAY 28 APPROACH PROFILE

HORIZ SCALE: 1" = 2000'
VERT SCALE: 1" = 200'

REVISIONS

#	By	Appr	Date	Revision

NOTES:
1. THE OBSTRUCTION EVALUATION IS BASED ON REVIEW OF:
NOAA AIRPORT OBSTRUCTION CHART
U.S.G.S. MAPS
PREVIOUS AIRSPACE PLANS.

2. THE DRAWING REFLECTS PLANNED CONFIGURATION SPECIFIC TO THIS AIRPORT AND IS NOT INTENDED TO BE USED AS A BASIS FOR NAVIGATION OR CONSTRUCTION.

3. VERTICAL DATUM NGVD88

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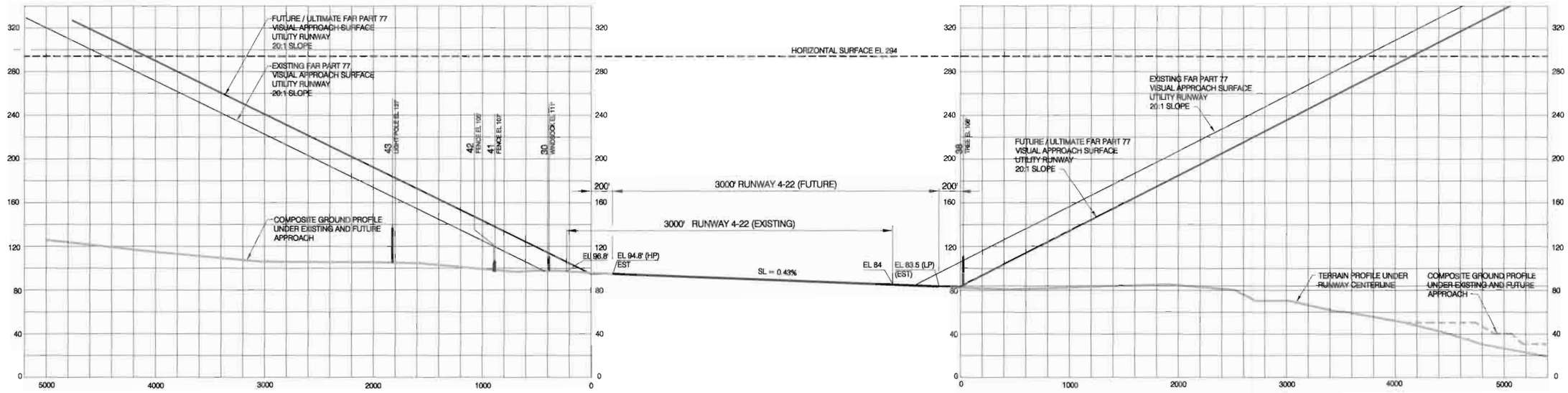
09/28/07 - 9:50am -

Date	11/06	Checked	RMF
Drawn	GPG	Approved	DMM

CENTURY WEST ENGINEERING CORPORATION
DAVID EVANS AND ASSOCIATES INC.

SKAGIT REGIONAL AIRPORT
Port of Skagit County, Washington

SHEET 5 OF 11
RUNWAY 10-28
AIRSPACE PROFILE
NOVEMBER 2006



RUNWAY 04-22 APPROACH PROFILES

HORIZ SCALE: 1" = 500'
VERT SCALE: 1" = 50'

NOTES:
1. THE OBSTRUCTION EVALUATION IS BASED ON REVIEW OF:
   NOAA AIRPORT OBSTRUCTION CHART
   U.S.G.S. MAPS
   PREVIOUS AIRSPACE PLANS
2. THE DRAWING REFLECTS PLANNED CONFIGURATION SPECIFIC TO THIS AIRPORT AND IS NOT INTENDED TO BE USED AS A BASIS FOR NAVIGATION OR CONSTRUCTION.
3. VERTICAL DATUM NGVD88.
4. SEE SHEETS 3 AND 4 FOR DISPOSITION OF OBSTRUCTIONS FOR RUNWAY 4/22. CLEAR 20:1 APPROACHES TO BE PROVIDED FOR FUTURE RUNWAY.

REVISIONS

#	By	Appr	Date	Revision

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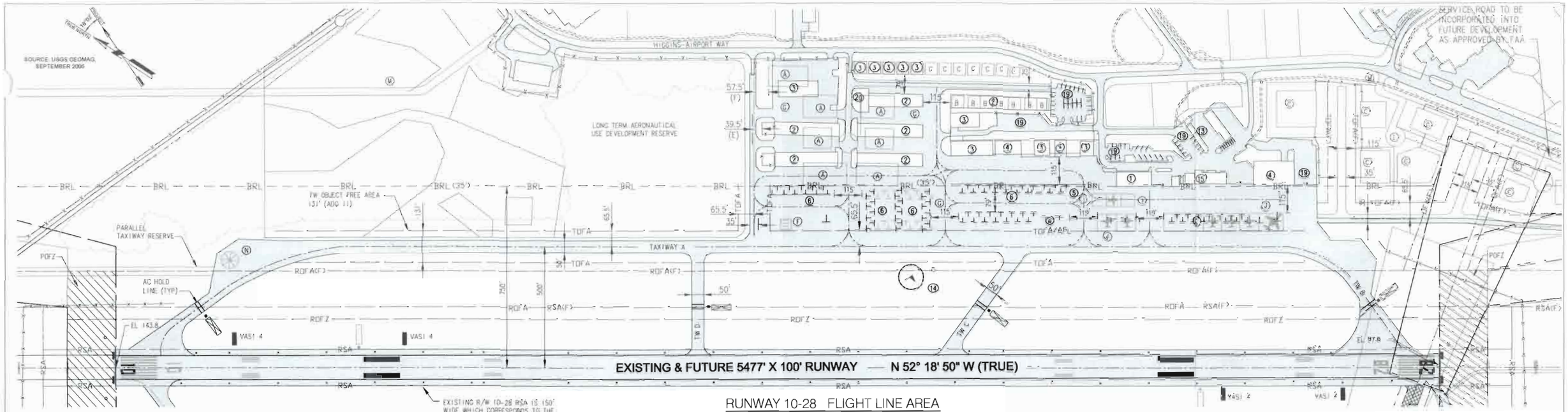
09/26/07 - 9:50am

Date 11/06 Checked RMF
Drawn GPG Approved DMM

CENTURY WEST ENGINEERING CORPORATION
DAVID EVANS AND ASSOCIATES INC.

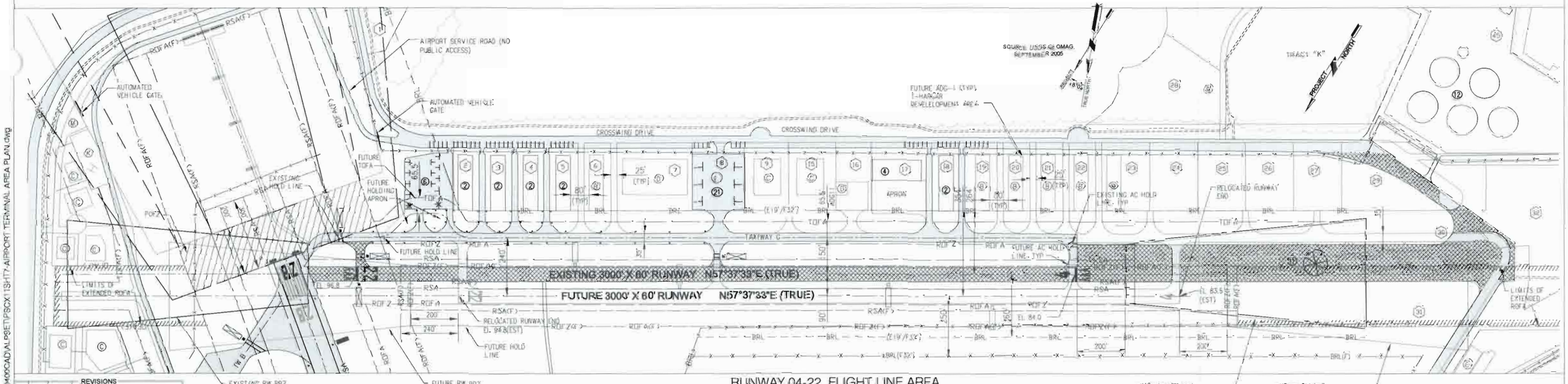
SKAGIT REGIONAL AIRPORT
Port of Skagit County, Washington

SHEET 6 OF 11
RUNWAY 04-22
AIRSPACE PROFILE
NOVEMBER 2006



RUNWAY 10-28 FLIGHT LINE AREA

SCALE: 1" = 200'



RUNWAY 04-22 FLIGHT LINE AREA

SCALE: 1" = 200'

NOTE:
SEE SHEET 2 FOR LEGEND AND TABLE OF EXISTING AND FUTURE FACILITIES.

NOTES:
1. VERTICAL DATUM IS NGVD 88. RUNWAY ELEVATIONS ARE TAKEN FROM 1997 AGIS OBSTRUCTION SURVEY. EXISTING TOPO FOR TOURS SHOWN ARE TAKEN FROM AVAILABLE INFORMATION. USE VERTICAL CONVERSION FACTOR TO CONVERT FROM NGVD 29 TO NAVD 88 = +3.79'.
2. HORIZONTAL DATUM NAD83

REVISIONS			
#	By	Appr	Date	Revision

Date	11/06	Checked	RMF
Drawn	GPG	Approved	DMM

CENTURY WEST ENGINEERING CORPORATION
DAVID EVANS AND ASSOCIATES INC.

0 200 400 600
SCALE IN FEET

PROJECT NORTH 18°02' TRUE NORTH
SOURCE: USGS GEOMAG, SEPTEMBER 2005

SKAGIT REGIONAL AIRPORT
Port of Skagit County, Washington

SHEET 7 OF 11
TERMINAL AREA PLANS
NOVEMBER 2006

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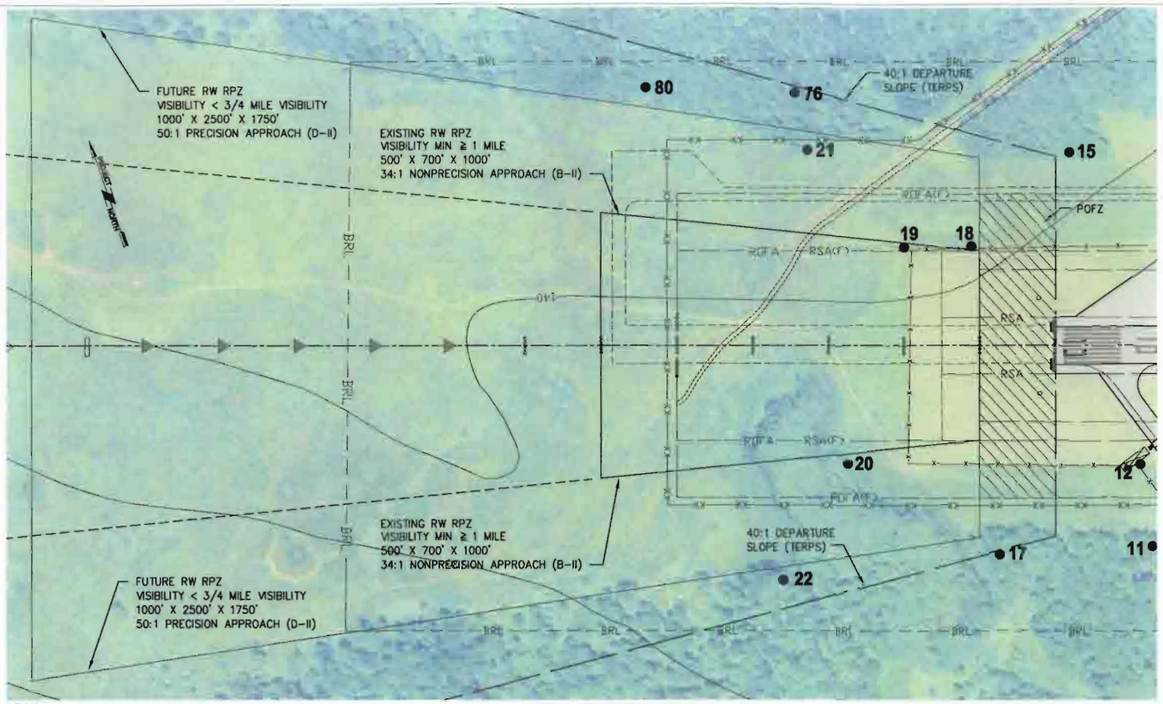
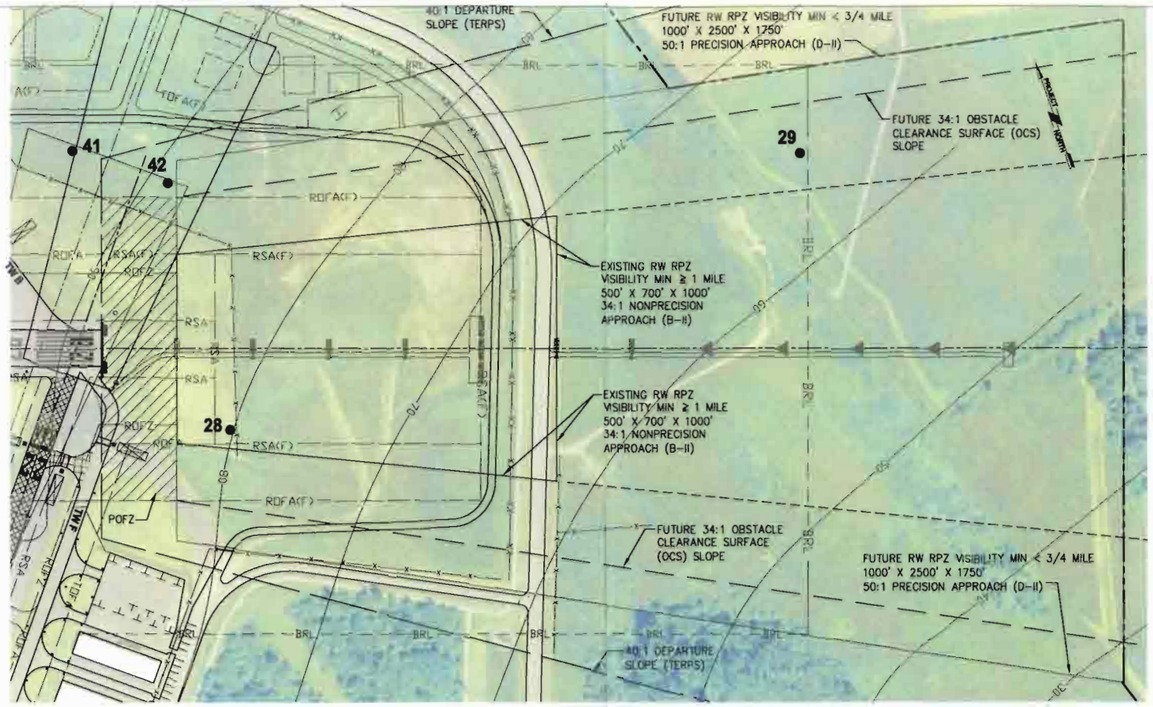


RUNWAY 10 APPROACH PLAN

SCALE: 1" = 200'



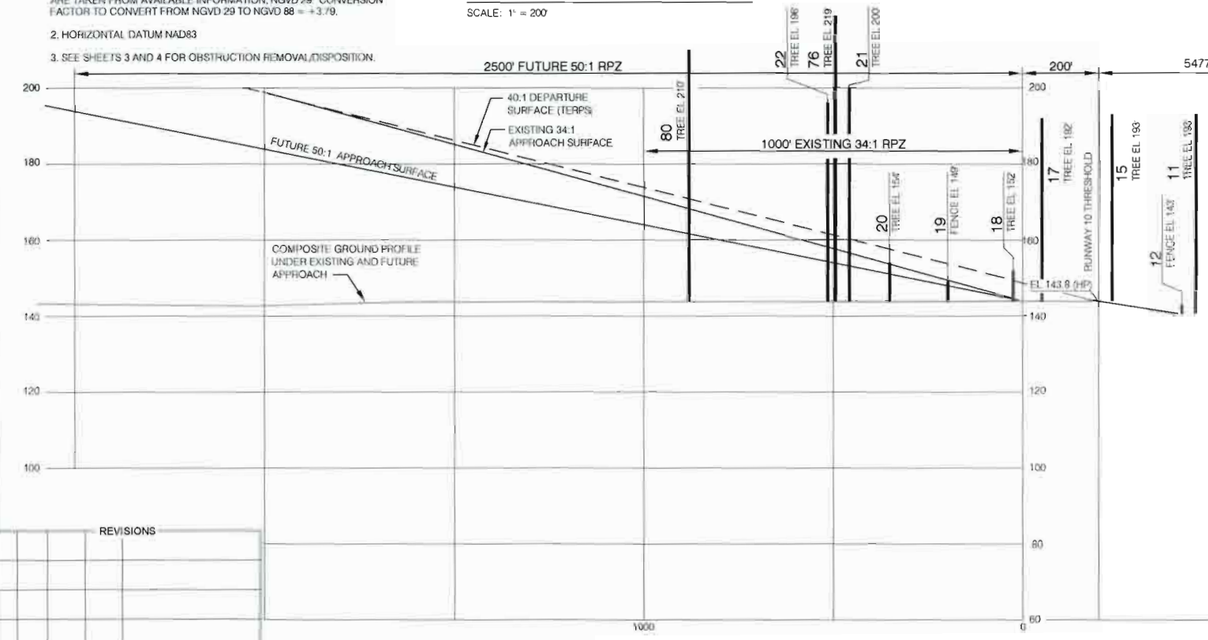
RUNWAY 28 APPROACH PLAN

SCALE: 1" = 200'

NOTES:
1. VERTICAL DATUM IS NGVD 88. RUNWAY ELEVATIONS ARE TAKEN FROM 1999 NOS OBSTRUCTION SURVEY. EXISTING TOPO CONTOURS SHOWN ARE TAKEN FROM AVAILABLE INFORMATION, NGVD 29. CONVERSION FACTOR TO CONVERT FROM NGVD 29 TO NGVD 88 = +3.79.

2. HORIZONTAL DATUM NAD83

3. SEE SHEETS 3 AND 4 FOR OBSTRUCTION REMOVAL/DISPOSITION.



RUNWAY 10 APPROACH PROFILE

HORIZ SCALE: 1" = 200'
VERTICAL SCALE: 1" = 20'

RUNWAY 28 APPROACH PROFILE

HORIZ SCALE: 1" = 200'
VERTICAL SCALE: 1" = 20'

REVISIONS				
#	By	Appr	Date	Revision

Date	11/06	Checked	RMF
Drawn	GPG	Approved	DMM

CENTURY WEST ENGINEERING CORPORATION
DAVID EVANS AND ASSOCIATES INC.

0 200 400 600
SCALE IN FEET

TRUE NORTH 18°02'

SOURCE: USGS GEOMAG, SEPTEMBER 2005

SKAGIT REGIONAL AIRPORT
Port of Skagit County, Washington

SHEET 8 OF 11
RUNWAY 10-28
RPZ PLAN AND PROFILE
NOVEMBER 2006

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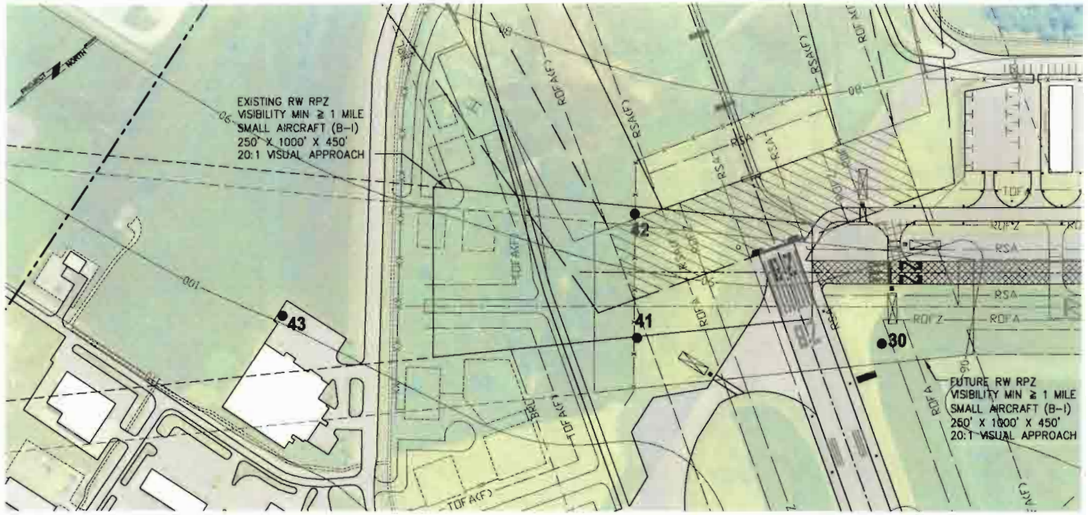


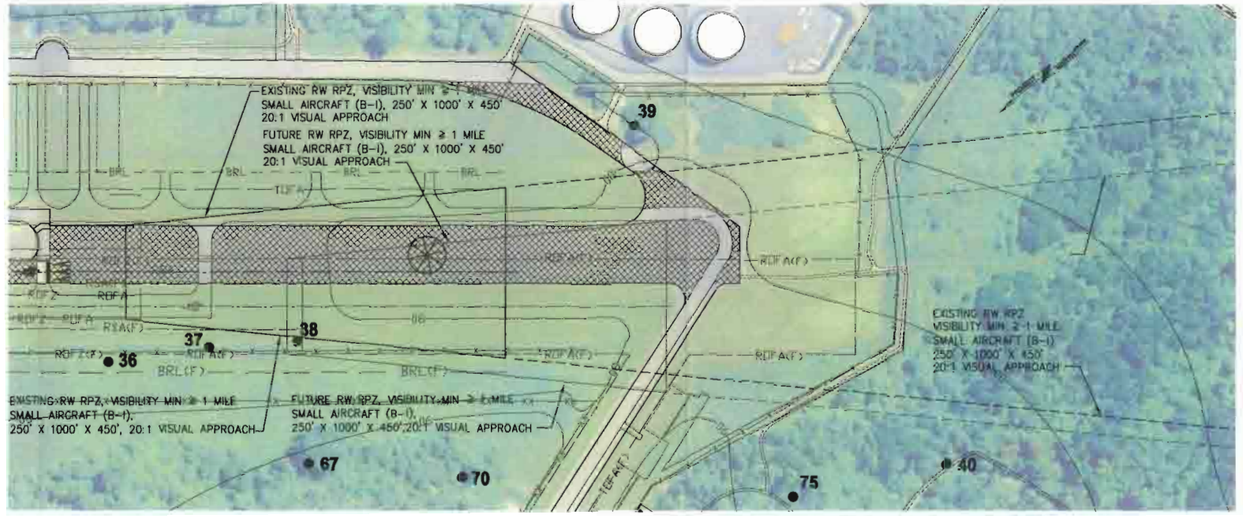
NOTES:
1. VERTICAL DATUM IS NGVD 88. RUNWAY ELEVATIONS ARE TAKEN FROM 1999 NOS OBSTRUCTION SURVEY. EXISTING TOPO CONTOURS SHOWN ARE TAKEN FROM AVAILABLE INFORMATION, NGVD 29. CONVERSION FACTOR TO CONVERT FROM NGVD 29 TO NGVD 88 = +3.79.

2. HORIZONTAL DATUM NAD83

3. SEE SHEETS 3 AND 4 FOR OBSTRUCTION REMOVAL/DISPOSITION.

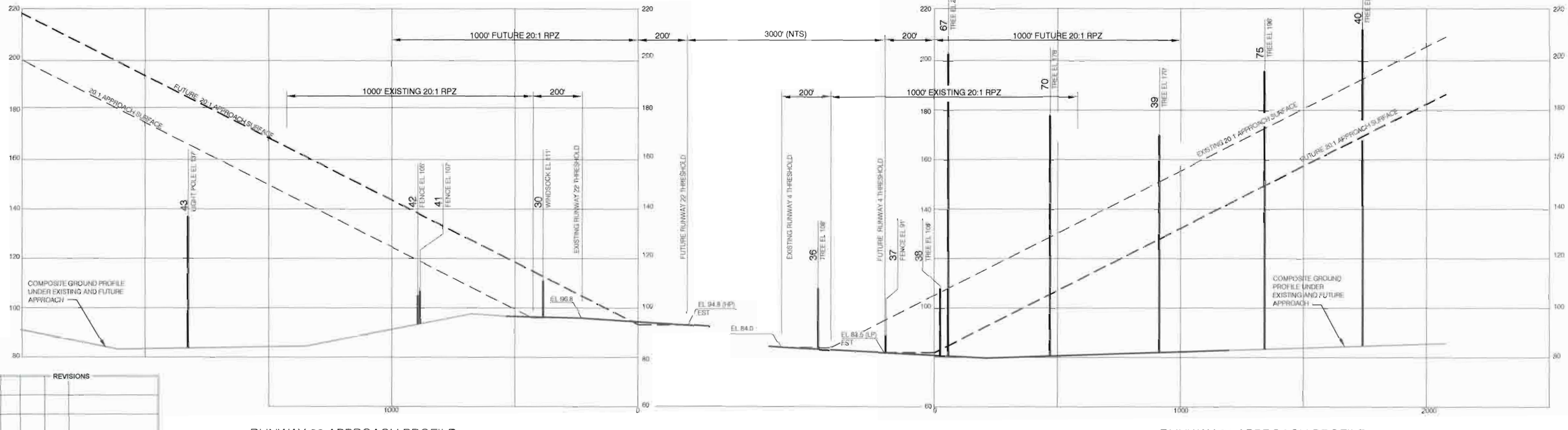
RUNWAY 22 APPROACH PLAN

SCALE: 1" = 200'



RUNWAY 04 APPROACH PLAN

SCALE: 1" = 200'



RUNWAY 22 APPROACH PROFILE

HORIZ SCALE: 1" = 200'
VERTICAL SCALE: 1" = 20'

RUNWAY 04 APPROACH PROFILE

HORIZ SCALE: 1" = 200'
VERTICAL SCALE: 1" = 20'

#	By	Appr	Date	Revision

REVISIONS

Date 11/06 Checked RME
Drawn GPG Approved DMM

CENTURY WEST ENGINEERING CORPORATION
DAVID EVANS AND ASSOCIATES INC.

0 300 600 900
SCALE IN FEET

TRUE NORTH 18°02'
SOURCE: USGS GEOMAG, SEPTEMBER 2005

SKAGIT REGIONAL AIRPORT
Port of Skagit County, Washington

SHEET 9 OF 11
RUNWAY 04-22
RPZ PLAN AND PROFILE
NOVEMBER 2006

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LEGEND

EXISTING INTERIM GROWTH BOUNDARY

PORT OF SKAGIT COUNTY BOUNDARY

LAND USE DESIGNATIONS

Ag-NRL — AGRICULTURAL – NATURAL RESOURCE LAND

AVR — AVIATION RELATED

BR-I — INDUSTRIAL

RRc-NRL — RURAL RESOURCE – NATURAL RESOURCE LAND

RRV — RURAL RESERVE

URV — URBAN RESERVE

WETLANDS

FUTURE DNL NOISE CONTOURS

55 DNL (YEAR 2025)

60 DNL (YEAR 2025)

65 DNL (YEAR 2025)

70 DNL (YEAR 2025)

NOTES:

1. FAA INM VERSION 6.1 USED TO DEVELOP NOISE CONTOURS. CONTOURS BASED ON MASTER PLAN FORECAST AIRCRAFT OPERATIONS FOR 2025.
2. 55 AND 60 DNL NOISE CONTOURS DEPICTED FOR CONSISTENCY WITH LOCAL LAND USE PLANNING. FAA RECOGNIZES NOISE CONTOUR LEVELS BEGINNING AT 65 DNL FOR AIRPORT NOISE AND LAND USE COMPATIBILITY PLANNING PURPOSES.
3. SKAGIT COUNTY OVERLAY ZONING IN EFFECT FOR AIRPORT.
4. FFA STANDARD IS 65 DNL.

Ag-NRL
URV
BR-I
Ag-NRL
BR-I
55 DNL
60 DNL
65 DNL
70 DNL
AVR
65 DNL
60 DNL
55 DNL
70 DNL
BR-I
RRV
BR-I
BR-I
RRV
RRc-NRL
Ag-NRL

REVISIONS

#	By	Appr	Date	Revision

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Date 11/06 Checked RMF
Drawn GPG Approved DMM

CENTURY WEST ENGINEERING CORPORATION
DAVID EVANS AND ASSOCIATES INC.

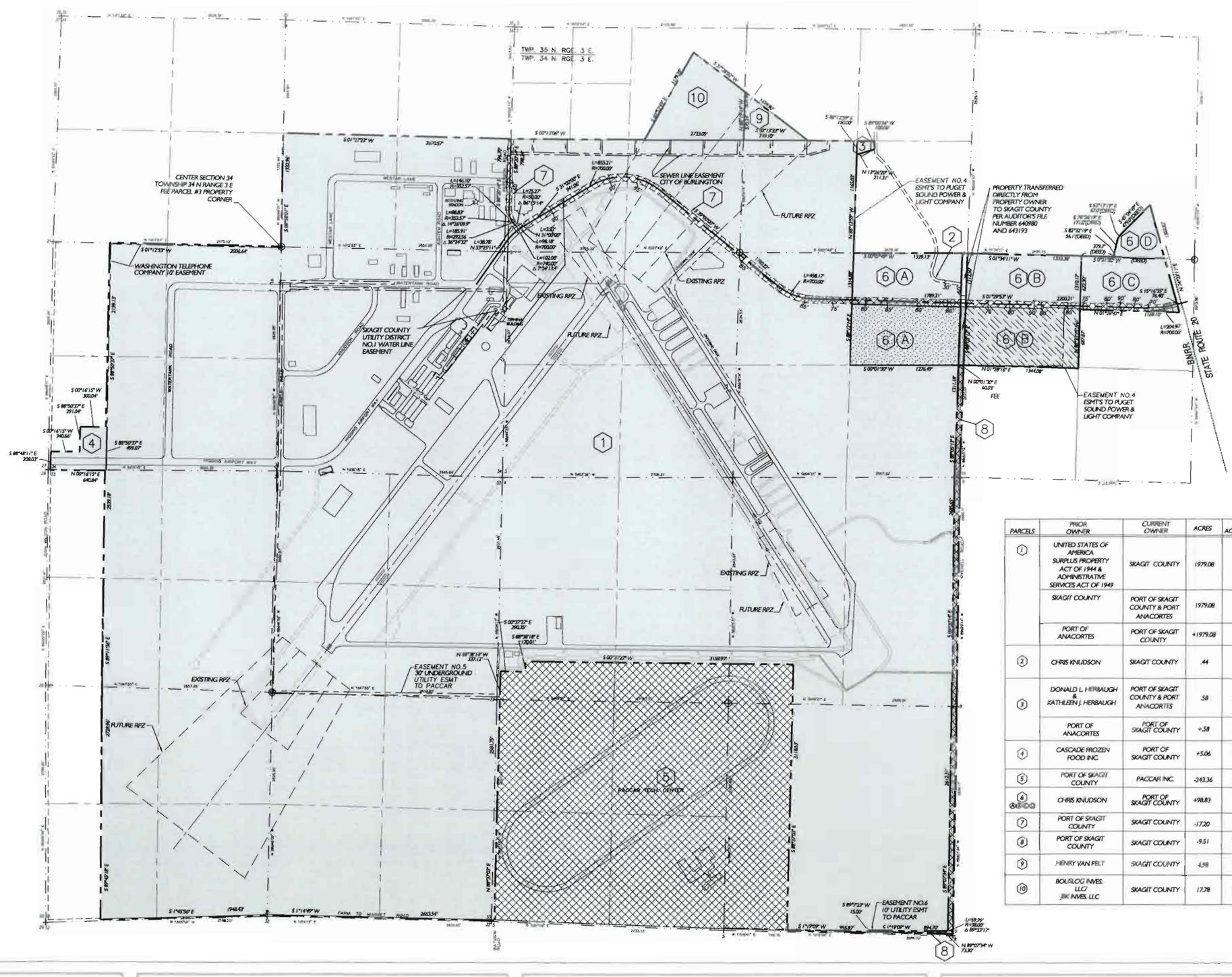
0 600 1200 1800
SCALE IN FEET

PROJECT 18°0Z TRUE NORTH

SOURCE: USGS GEOMAG, SEPTEMBER 2005

SKAGIT REGIONAL AIRPORT
Port of Skagit County, Washington

SHEET 10 OF 11
AIRPORT LAND USE PLAN
NOVEMBER 2006



LEGEND

- AIRPORT PROPERTY (1813.48 AC.)
- SECTION LINES
- EXISTING UTILITY EASEMENT
- (3) PARCEL NUMBER
- PARCEL BOUNDARY
- EXISTING FEE OWNERSHIP
- PRIOR FEE OWNERSHIP
- EXISTING FACILITIES
- FUTURE FACILITIES
- EXISTING RUNWAY PROTECTION ZONE (RPZ)
- FUTURE RUNWAY PROTECTION ZONE (RPZ)

SCALE
500 0 250 500 1000
(FEET)
1 INCH = 500 FT

TOWNSHIP	T35N, T34N
RANGE	R3E
SECTION	3,4,33,34
COUNTY	SKAGIT

PARCELS	PRIOR OWNER	CURRENT OWNER	ACRES	DATE ACQUIRED	AUDITOR'S FILE NUMBER	ACQUISITION PURPOSE	NOTES
(1)	UNITED STATES OF AMERICA SURPLUS PROPERTY ACT OF 1944 & ADMINISTRATIVE SERVICES ACT OF 1949	SKAGIT COUNTY	1979.08	2/15/58	563607	AERONAUTICAL	
	SKAGIT COUNTY	PORT OF SKAGIT COUNTY & PORT ANACORTES	1979.08	2/3/65	665304	AERONAUTICAL	
	PORT OF ANACORTES	PORT OF SKAGIT COUNTY	+1979.08	6/17/75	820156	AERONAUTICAL	
(2)	CHRIS KNUDSON	SKAGIT COUNTY	.44	4/22/75	RESOLUTION # 6584	RELEASED FROM PARCEL 6A PRIOR TO PORT ACQUISITION COUNTY ROAD	
(3)	DONALD L. HERBAUGH & KATHLEEN J. HERBAUGH	PORT OF SKAGIT COUNTY & PORT ANACORTES	.58	5/16/75	817940	ACCESS ROAD	
	PORT OF ANACORTES	PORT OF SKAGIT COUNTY	+.58	5/13/76	835149	ACCESS ROAD	
(4)	CASCADE FROZEN FOOD INC.	PORT OF SKAGIT COUNTY	+5.06	8/31/76	845884	AERONAUTICAL	
(5)	PORT OF SKAGIT COUNTY	PACCAR INC.	-243.36	12/21/79	7912210064	RELEASED - TESTING FACILITY	RELEASED PARCEL 5 12/21/79
(6) (6A)(6B)(6C)(6D)	CHRIS KNUDSON	PORT OF SKAGIT COUNTY	+98.83	12/27/79	7912280047	AERONAUTICAL	PURCHASED PARCEL 6 WITH FUNDS RECEIVED FROM SALE OF SURPLUS PROPERTY
(7)	PORT OF SKAGIT COUNTY	SKAGIT COUNTY	-17.20	3/2/87	8703030001	RELEASED - COUNTY ROAD	
(8)	PORT OF SKAGIT COUNTY	SKAGIT COUNTY	-9.51	5/28/87	8705280037	RELEASED - COUNTY ROAD	
(9)	HENRY VAN FELT	SKAGIT COUNTY	4.98	3/14/03	200303140201	AERONAUTICAL - RPZ	PURCHASED UNDER AIP# 3-53-0010-013
(10)	BOUSLOG INVES. LLC/ JBK INVES. LLC	SKAGIT COUNTY	17.78	6/22/05	200506220164	AERONAUTICAL - RPZ	PURCHASED UNDER AIP# 3-53-0010-014

Date 11/06 Checked DMM
Drawn GPG Approved RMF

CENTURY WEST ENGINEERING CORPORATION
DAVID EVANS AND ASSOCIATES INC.

SKAGIT REGIONAL AIRPORT
Port of Skagit County, Washington

SHEET 11 OF 11
EXHIBIT A - PROPERTY MAP
NOVEMBER 2006

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Skagit Regional Airport
Airport Master Plan Update

Appendix A

Appendix Table A-1

AIRPORT SUMMARY OF OPERATIONS BY AIRCRAFT TYPE, 2004-2025

Skagit Regional Airport Master Plan

		Forecast Years				
Operations By Type	**2004** [1]	**2005**	**2010**	**2015**	**2020**	**2025**
Commercial Service [2]	*2,000*	*3,280*	*3,704*	*3,993*	*4,295*	*4,630*
Single Engine Piston	252	978	1,057	844	1,017	1,222
Multi-Engine Piston [3]	600	150	150	150	150	150
Turboprop	1,148	2,152	2,497	2,999	3,128	3,258
General Aviation	*55,300*	*58,100*	*63,680*	*70,875*	*73,804*	*76,732*
Single Engine Piston	50,260	52,202	56,979	63,028	65,452	68,021
Multi-Engine Piston	1,122	1,694	1,807	1,949	1,961	1,968
Turboprop	689	738	872	1,140	1,239	1,283
Business Jet	1,033	1,106	1,422	1,859	2,202	2,383
Helicopter	2,196	2,359	2,599	2,899	2,950	3,077
Military	*100*	*100*	*100*	*100*	*100*	*100*
total operations	**57,400**	**61,480**	**67,484**	**74,968**	**78,199**	**81,462**

Source: David Miller, Century West Engineering

[1] Actual.

[2] Includes scheduled and nonscheduled air taxi operations, air cargo and express operations.

[3] Significant decline in commercial MEP operations attributed to terminated/reduced operations of Methow Aviation and Aeronautical Services at BVS.

Critical Aircraft/ARC/Weight Analysis

Note: (typ) indicates aircraft typical of type/class

Commercial Service (CS)	2004 ops.	2005 ops.	2010 ops.	2015 ops.	2020 ops.	2025 ops.	ARC	weight lbs.	RW length
Cessna 208B G. Caravan *(typ)*	1,148	2,152	2,497	2,999	3,128	3,258	A-II	8,000	2,420
Piper Navajo/Beechcraft 18 [2] *(typ)*	600	150	150	150	150	150	B-I	9,900[1]	2,510
Cessna 206 *(typ)*	252	978	1,057	844	1,017	1,222	A-I	3,614	1,900
total - Commercial	**2,000**	**3,280**	**3,704**	**3,993**	**4,295**	**4,630**			
General Aviation (GA)	**2004 ops.**	**2005 ops.**	**2010 ops.**	**2015 ops.**	**2020 ops.**	**2025 ops.**	**ARC**	**weight lbs.**	**RW length**
Cessna 172 (SEP) *(typ)*	50,260	52,202	56,979	63,028	65,452	68,021	A-I	2,658	1,700
Beech 58 Baron (MEP) *(typ)*	1,122	1,694	1,807	1,949	1,961	1,968	A-II	5,500	2,100
Beech King Air B200 (METP) *(typ)*	620	664	697	798	805	770	B-II	12,500	2,900
Pilatus PC-12 (SETP) *(typ)*	69	74	174	342	434	513	B-II	9,920	2,300
Cessna Mustang/Eclipse 500 (BJ) *(typ)*	0	0	71	149	220	238	B-I	5,640	2,200
Cessna Citation CJ2 (BJ) *(typ)*	155	166	199	260	286	310	B-I	12,375	3,590
Cessna Citation 550 Bravo (BJ) *(typ)*	413	443	540	651	771	834	B-II	14,800	3,920
Cessna Citation 560 Excel (BJ) *(typ)*	103	111	142	186	242	262	B-II	20,000	3,750
Learjet 31 (BJ) *(typ)*	26	28	28	37	44	48	C-I	17,000	5,000
Beechjet 400A (BJ) *(typ)*	26	28	28	37	44	48	C-I	16,100	3,900
Gulfstream III (G300) (BJ) *(typ)*	289	310	384	502	551	596	C-II	68,700	6,000
Gulfstream IV (BJ) *(typ)*	21	22	28	37	44	48	D-II	71,780	6,500
total - GA fixed wing	**53,104**	**55,740**	**61,080**	**67,976**	**70,854**	**73,655**			
total - Military rotorcraft	100	100	100	100	100	100			
total - GA rotorcraft	2,196	2,359	2,599	2,899	2,950	3,077			
total - All operations	**57,400**	**61,479**	**67,483**	**74,968**	**78,199**	**81,462**			
subtotal CS ADG II Ops	1,148	2,152	2,497	2,999	3,128	3,258			
subtotal GA ADG II Ops	2,637	3,317	3,774	4,465	4,807	4,991			
subtotal App. Cat C&D Ops (All)	362	387	469	614	683	739			
subtotal App. Cat C&D (ADG II) Ops [3]	310	332	412	539	595	643			
subtotal Ops ≥ 12,500lbs.	1,498	1,604	1,849	2,248	2,501	2,605			
subtotal Ops ≥ 60,000lbs.	310	332	412	539	595	643			

[1] MGTW Beechcraft Model 18; Piper Navajo MGTW 6,000lb.

[2] Significant decline in commercial MEP operations attributed to terminated/reduced operation of Mellow Aviation and Aeronautical Services at BVS

[3] Approach Category C & D ADG II operations combined to reflect common planning requirements for these aircraft as defined in AC 150/5300-13 Airport design aircraft based on ARC D-II for long-term planning purposes