Scappoose Industrial Airpark Master Plan Update

March 2016

FINAL REPORT

WHPacific

Presented to

PORT OF ST. HELENS

The Columbia River's Deep Water Port with a Future.

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March 2016

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Chapter One INTRODUCTION

Scappoose Industrial Airpark Master Plan Update

To update the 2004 Scappoose Industrial Airpark Master Plan, the Port of St. Helens (POSH) completed an Airport Master Plan Update study. The purpose of the master plan was to identify necessary airport improvements to serve current and projected aviation demand, comply with Federal Aviation Administration (FAA) design standards, and address airport sponsor, airport user, and other stakeholder issues identified as part of the planning process.

The FAA recommends that airports periodically update their master plans as conditions affecting airport operations and development occur. Consequently, the timeframe to update a master plan varies for different airports. The 2004 Plan used baseline data from 2000-2001, so the study elements such as the existing conditions, forecasts, and facility needs are over a decade old.

PLANNING PROCESS

In March 2013, the Master Plan Update study kicked off with a grant from the FAA to fund 90% and POSH funding the 10% balance. The planning process and documentation, as required, followed FAA Advisory Circular 150/5070-6B, *Airport Master Plans*. The Master Plan Update study involved several tasks spanning an estimated 18-month study timeframe.

The documentation of the study findings for the Scappoose Industrial Airpark (Airport) are presented in eight chapters to include the following:

1. Airport Issues and Goals
2. Inventory
3. Forecasts
4. Facility Requirements
5. Alternatives
6. Compliance Review
7. Airport Layout Plan
8. Capital Improvement Plan

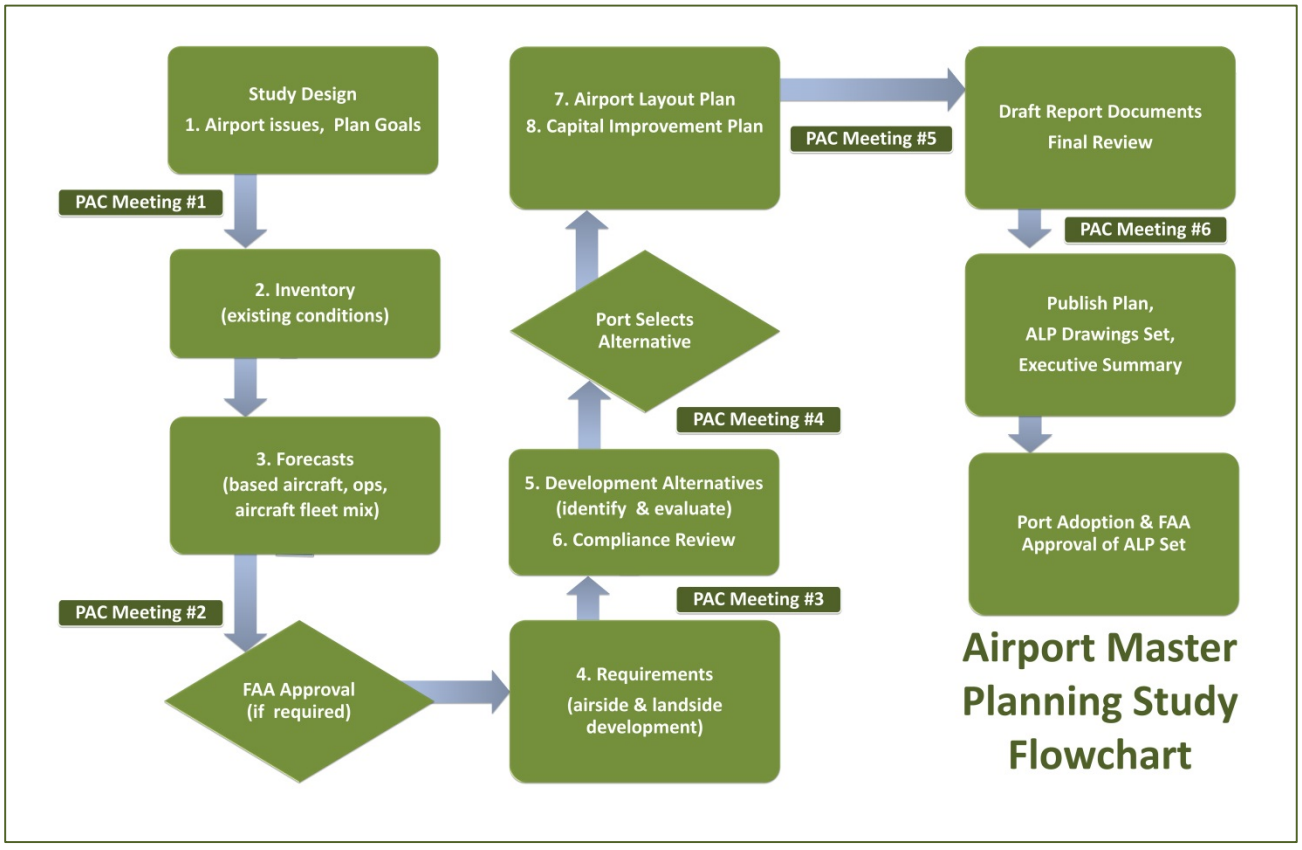

EXHIBIT 1A

The chapters were published in draft format for review and comment throughout the planning process. Once review comments were incorporated into all draft chapters, a comprehensive report was published. Further, the Airport Layout Plan (ALP)—presented in the 2004 master plan and revised in 2007 to reflect land acquisition—was updated as part of this master plan update. The ALP update graphically depicts current facilities and the POSH's long-term development plans to

FAA design standards to ensure the Airport remains eligible for Federal and State funding support.

Since numerous aviation and airport-related terms and acronyms are used in the master plan, a glossary is included in Appendix A.

AIRPORT ISSUES

Identifying airport issues in the early stages of the planning process is important to encourage discussion among and gain a broad perspective from the POSH's staff, airport users, and other stakeholders. Addressing such issues proactively in the study enhanced the success of the planning process and provided all involved with a more cohesive understanding of the Airport and the POSH's ultimate development plan.

The following is the list of airport issues identified in the early stages of the master planning process, which expanded in subsequent elements as the study progressed.

- Airport's role in serving the community and region
- Runway length to accommodate changing aircraft fleet mix
- Airport tenant needs for aircraft storage and future expansion
- Redevelopment of building areas in poor condition
- Transient aircraft operator needs
- Utility infrastructure needs
- Interior roadway improvements
- Runway protection zone and road off Runway 15 end
- Growing vegetation, trees
- Fencing/security
- Maximizing landside development (functional, long-term)
- Off-airport compatible land use development and through-the-fence operators
- Land and/or easement acquisition

To uncover additional issues for the planning study, a survey questionnaire (Appendix B) was prepared and distributed. Copies of the survey were mailed out to the local based aircraft owners and airport tenants and made available in the public area of the Fixed Base Operator (FBO) terminal for transient pilots. Some of the issues identified by the respondents included the need for an airport café or nearby restaurant, more hangar storage, and providing a grass strip. Some respondents commented on POSH operational policies and rates indicating that hangar rates and insurance requirements were of concern.

Additional discussion of the issues in this element of the study continued in later elements so they are further documented in later chapters such as Chapter 4, Facility Requirements.

PLAN GOALS

The Master Plan goals guided the POSH's near- to long-term development plans for both airside and landside facilities at the Airport. The following plan goals were identified:

- Enhance safety and security
- Support economic growth
- Accommodate demand
- Preserve/protect investment

These goals provided the framework for evaluating the various development alternatives for the Airport.

PUBLIC INVOLVEMENT

An active public involvement program is vital to the successful planning and implementation of airport master plans. Throughout the study, POSH remained committed to providing the community with opportunities to follow the master planning process, ask questions, and provide input. The Port established the following means to facilitate an open and successful public involvement program:

- Planning Advisory Committee Meetings: The Port established a Planning Advisory Committee (PAC), which is a 12-member committee representing a cross section of the community and representatives from the Oregon Department of Aviation (ODA) and Federal Aviation Administration (FAA). These PAC members served as community liaisons and participated in five work sessions over the 18-month planning process plus a sixth meeting for the Port Commission presentation. The PAC discussed airport issues, study progress, and key findings, and provided input, evaluated development concepts, and provided review comments and questions on all draft materials produced throughout the study process. PAC members were invited to share their knowledge of the study findings with the public at any opportunity. The first PAC meeting/work session was held on March 20, 2013 with the subsequent four work sessions held between mid-2013 and mid-2014. The last meeting—a Port Commission presentation—was held in January 2015.

- Public Open Houses: The Port held four public open houses–each of which followed a PAC meeting held on the same day. The public open houses allowed the public to ask questions, identify concerns, and provide input to the study. The first public open house followed PAC meeting #2.
- Project Website: To keep the public informed, the Port posted project information to include key contacts, scope of work, project schedule, meeting materials, and draft report chapters on their website at: www.portsh.org

AIRPORT ROLE

Identifying the role of an airport is important to define how it is or should be serving the air transportation system at a national, state and regional level. This section briefly summarizes the Airport role as it is defined today and whether there are issues driving the need to consider changing that role in the future.

NATIONAL SYSTEM ROLE

The National Plan of Integrated Airport Systems (NPIAS) is the document that lists all existing and proposed airports considered significant to national air transportation and eligible for federal airport improvement funding. The Scappoose Industrial Airpark is identified by the Federal Aviation Administration (FAA) as one of 2,563 General Aviation (GA) facilities nationwide in the NPIAS, dated 2012. GA airports do not have scheduled passenger service. The Scappoose Industrial Airpark qualifies for inclusion in the NPIAS since it meets the general criteria for based aircraft and proximity to other NPIAS airports. NPIAS inclusion typically requires at least 10 based aircraft and a distance of 20 miles (30-minute drive time) or more from another NPIAS airport. Scappoose has well over 10 based aircraft. The closest airports by nautical miles (nm) or flight time to Scappoose have a drive time in excess of 30 minutes and include:

- Pearson Field Airport, Vancouver, WA (12 nm SE) – driving: 26 statute miles /46 minutes
- Portland-Hillsboro, Hillsboro, OR (14 nm S) – driving: 23 statute miles /37 minutes
- Portland International (16 nm SE) – driving: 29 statute miles /53 minutes

While each of these three airports are fairly close ranging from 12 to 16 nautical miles, this close proximity of NPIAS airports is not unusual in urban areas where it is justified by the need for additional airport capacity.

STATE SYSTEM ROLE

The Oregon Aviation Plan (OAP 2007) designated Scappoose Industrial Airpark as an Urban General Aviation (GA) Airport, which the OAP 2007 defines as follows:

> *These airports support all general aviation aircraft and accommodate corporate aviation activity, including business jets, helicopters, and other general aviation activity. The airports' primary users are business related and service a large geographic region or they experience high levels of general aviation activity.*

Designating a role for each airport in the airport system helps to distinguish between the various types and levels of aviation activity served by each across the state, and subsequently helps identify the minimum and desired facilities and services for each category of airport. The OAP 2007 defined five different roles for the 97 airports considered in the statewide system. These five roles included the following:

- Category I, Commercial Service – 8 airports
- Category II, Urban GA – 10 airports
- Category III, Regional GA – 13 airports
- Category IV, Local GA – 27 airports
- Category V, Remote Access/Emergency Service – 39 airports

For Urban GA Airports like Scappoose, key recommendations for this category include serving business jets with a 5,000-by-100-foot runway, a precision instrument approach, terminal building, and full-service FBO to provide services such as fueling, aircraft repair and maintenance, hangar and tiedown rentals, aircraft charters, pilot training, and amenities for pilots and passengers.

REGIONAL SYSTEM ROLE

The Scappoose Industrial Airpark serves an important role in the Portland-Vancouver metropolitan area. Presently, it is one of five airports with at least 5,000 feet of runway length in the metro area, excluding Portland International Airport. Like Scappoose, these other airports fall into the Category II, Urban GA Airport classification discussed above. **Table 1A** provides a comparison of the facilities and services at these metro area airports.

Scappoose serves a broad range of GA activity and is home to a variety of airport tenants from private aircraft owners to businesses. Consequently, the Airport provides significant economic benefit to the region. The OAP 2014 Update included an Economic Impact Analysis for airports

in the state, which reported 119 jobs at the Scappoose Industrial Airpark (up from 72 in the previous 2007 report), and a total of 378 jobs attributed to the Airport when direct off-airport and "spin-off" (multiplier) effects are included—up from 304 total jobs noted in the 2007 report. Annual wages for these jobs amount to $22.7 million. Annual business sales, aviation and non-aviation related, total $67.7 million. See Appendix D for a copy of the Economic Impact Analysis prepared for Scappoose in the OAP 2014 Update.

Table 1A. Portland-Vancouver Metro Area Airports with Runway of 5,000+ feet

Airport & Acreage	Distance (nm) To SPB	Paved Runway(s)	Lighting, Navaids	Services	Based Aircraft & Operations (Ops)
Scappoose 196 acres	-	Rwy 15-33 5,100' x 100'	Rotating Beacon, MIRL, Lighted Wind Indicator, PAPI, RNAV (GPS), VOR/DME	Avgas, Jet A, ASOS, Major A&P Service	130 aircraft 60,000 ops
Portland-Hillsboro 900 acres	14 nm S	Rwy 13-31 6,600' x 150' Rwy 2-20 4,050' x 100'	Rotating beacon, HIRL MALSR, PAPI, VASI, Lighted Wind Indicator, ILS, RNAV (GPS), VOR/ DME, NDB	Avgas, Jet A, ASOS, Major A&P Service, ATCT	277 aircraft 253,847 ops
Mc Minnville 650 acres	37 nm S	Rwy 4-22 5,420' x 150' Rwy 17-35 4,340' x 75'	Rotating beacon, HIRL MALSR, PAPI, Lighted Wind Indicator, ILS, RNAV (GPS), VOR/DME	Avgas, Jet A, ASOS, Major A&P Service	126 aircraft 63,500 ops
Portland-Troutdale 284 acres	24 nm SE	Rwy 7-25 5,399' x 150'	Rotating beacon, MIRL PAPI, VASI, Lighted Wind Indicator, GPS-A, NDB	Avgas, Jet A, ASOS, Major A&P Service, ATCT	145 aircraft 105,020 ops
Aurora State 144 acres	32 nm S	Rwy 17-35 5,004' x 100'	Rotating Beacon, MIRL, VASI, Lighted Wind Indicator, Segmented Circle, RNAV (GPS), LOC, VOR/DME	Avgas, Jet A, ASOS, Major A&P Service	309 aircraft 73,895 ops

A&P = Airframe & Powerplant
ASOS = Automated Surface Observing System
ATCT = Air Traffic Control Tower
DME= Distance Measuring Equipment
GPS = Global Positioning System
MALSR = Medium Intensity Approach Lighting System with Runway Indicator Lights
HIRL/MIRL = High/Medium Intensity Runway Lighting
MSL=Mean Sea Level
Operation = takeoff or landing
PAPI= Precision Approach Path Indicator (glide slope navigational aid -- similar to VASI)
REIL = Runway End Identifier Lights
RNAV = Area Navigation
VASI= Visual Approach Slope Indicator (similar to PAPI)
VOR=Very High Frequency Omnidirectional Range Station (electronic navigation aid)

Source: FAA Airport Master Records (Form 5010); Scappoose based aircraft figure estimated in coordination with POSH and hangar/tiedown lease data

The airport user survey questionnaire, described earlier, as well as input from the FBO provided a better understanding of how Scappoose is used.

A total of 60 survey questionnaires were returned. Of the 60 respondents, 34 indicated that they presently base an aircraft at Scappoose. Of the 26 aircraft based elsewhere, half are based at Pearson Field or Portland-Hillsboro. Two of the respondents indicated that while they base an aircraft at Scappoose, they have a second aircraft at another airport due to insufficient hangar storage at Scappoose. Nearly all of the transient aircraft operator respondents base their aircraft at other airports simply due to location—Scappoose is too distant from their residence. The majority of aircraft used by respondents were small, single engine piston aircraft, such as the Cessna 172. The survey respondents conduct over 7,100 aircraft operations annually with 53% of those operations conducted at Scappoose.

The top ranking responses for the primary use of the Airport include recreational (67%), fuel (20%), training (15%), and business (7%) with many respondents identifying more than one use.

According to discussions with tenants and airport users, examples of aviation activity conducted at the Airport by transient or based aircraft include:

- Recreational Flying
- Corporate
- Flight Training
- Medical/Patient Transfer
- Police/Law Enforcement
- Military
- Real Estate Tours
- Special Events (Wings and Wheels, Antique Aircraft Association Fly-in)

AIRPORT ROLE CONCLUSIONS AND RECOMMENDATIONS

The Scappoose Industrial Airpark's facilities, services, and activity align with its current designated role in the *OAP 2007* as an Urban General Aviation (GA) Airport. While jet activity is presently low, Scappoose has facilities and services to accommodate increased activity. Subsequent chapters further describe the projected aviation growth and future improvements to better serve the demand at Scappoose.

Chapter Two INVENTORY

Scappoose Industrial Airpark Master Plan Update

The Inventory Chapter documents the existing conditions for the Scappoose Industrial Airpark (Airport) to include airport facilities and aviation activity, as well as existing conditions in the airport environs. The information presented represents baseline data and the foundation for the subsequent chapters. Identifying what is available allowed the study to address what facilities are insufficient to meet projected aviation demand.

AIRPORT LOCATION AND ACCESS

The Scappoose Industrial Airpark is located in Scappoose, Oregon, which is in the northwest corner of the state. Downtown Scappoose is one mile southwest of the Airport via West Lane Road to Columbia Avenue into town. The Airport is in Columbia County, west of the Columbia River and east of U.S. Highway 30 (Lower Columbia River Highway), as shown on **Exhibit 2A.** The closest major air carrier airport is Portland International, 30 miles to the southeast and just under a one-hour drive.

AREA TOPOGRAPHY AND CLIMATE

The Airport is located within the Columbia River Valley. Rolling hills are to the east of Scappoose and forested hillsides are to the west. The City elevation of 62 feet mean sea level (MSL) is slightly


La Center
St. Helens
Ridgefield
Scappoose Industrial Airpark
Scappoose
LOWER COLUMBIA RIVER
30
Columbia
Multnomah
Columbia River
Vancouver
Washington
Portland
North Plains
Hillsboro
26
SUNSET
Location Map
NORTH
Sources:
Roads, Cities: ODOT GIS Data
Hydrology: BLM GIS Data
0
1.25
2.5
5
Miles
EXHIBIT 2A

higher than the Airport's 58-foot MSL elevation. However, the south end of the Airport is at 30 feet MSL–28 feet lower than the north end.

Scappoose has a Mediterranean climate with dry warm summers and mild winters. Average summertime highs are around 80 degrees Fahrenheit. In wintertime, average highs are in the mid-40s to low 50s and average lows in the 30s. According to the Western Regional Climate Center's data for Scappoose (1998 through 2008), the mean maximum temperature of the hottest month (August) is 80.8° Fahrenheit. During this same time period, average annual precipitation for Scappoose was 39 inches. There are an estimated 139 days of sunshine annually.

COMMUNITY AND AIRPORT HISTORY

According to the Scappoose Historical Society, early inhabitants of the area included the Chinook Indians and other Northwest tribes. Further, the "Scappoose" name is derived from the Chinook Tribe and means "gravelly plains". Settlers were attracted to the Northwest in 1828 for its abundant natural resources. Logging, dairy farming, and gravel mining were examples of early industries in the area. Later, the community became home to several factories. In more recent years, the City has offered incentives to attract new business development and growth.

The Airport's history dates back to its role as an emergency landing strip during World War II. In 1943, the Airport's first paved runway was constructed to 4,000 feet. In 2000, the runway was extended to its present length of 5,100 feet. The Airport was originally county-owned before its transfer to the Port of St. Helens (POSH).

Other development history on the Airport was extracted from FAA records. These records provide a more detailed sequence of development by grant years. However, the project descriptions in the old FAA grant records are often vague. The FAA project descriptions are listed here:

- *1983 – Acquire land for approaches; construct apron; improve access road*
- *1985 – Extend parallel taxiway; seal apron; install safety fencing; improve airport drainage; install runway vertical/visual guidance system on both runway ends*
- *1986 – Rehabilitate runway (crack seal, seal coat, and mark Runway 15-33, 4000x50); construct apron; construct holding aprons A, B and C; construct and mark hangar taxiways*
- *1988 – Acquire land for development (parcel 12); conduct airport master plan study*
- *1992 – Design east parallel taxiway relocation, east side service road, signs, taxiway reflectors, rotating beacon, and REILs. Construct four T-hangar taxiways; install and relocate perimeter fencing (1,400 linear feet); construct taxiway; install apron lighting; acquire aircraft rescue & firefighting safety equipment*
- *1996 – Acquire land, parcel 29*
- *1998 – Conduct environmental assessment for Runway 15-33 extension*

- *2000 – Extend and rehabilitate Runway 15-33; install MIRL; extend west side parallel taxiway; extend east side parallel taxiway; install PAPI - Runway 15 and 33; update ALP*
- *2001 – Install beacon (replace pole); install perimeter fence; remove obstruction*
- *2002 – Conduct master plan update*
- *2002 – ODA multiple development; rehabilitate taxiway and apron (slurry seal)*
- *2004 – Install perimeter fencing, including road realignment*
- *2005 – Rehabilitate Runway 15-33 including taxiway (crack and fog seal)*
- *2006 – Acquire land for development (Ross property, Parcel 26), including relocation assistance; revise the ALP*
- *2008 – Remove obstructions, including survey and environmental review (Phase 1)*
- *2009 – Remove obstructions, including easements and off-airport tree removal (Phase 2); modify access road, including environmental and predesign (Phase 1)*
- *2009 – Modify access road (Phase 2); install perimeter fencing and gates*
- *2012 – Update airport master plan; install airfield guidance signs*

AVIATION ACTIVITY

Aviation activity at a general aviation airport is typically measured by the number of based aircraft and the number of annual aircraft operations (takeoffs and landings, including touch-and-go operations performed during flight training).

According to private hangar and tiedown leases, estimated business tenant aircraft, historical FAA data on aircraft fleet mix, and discussion with the POSH, the following is the estimated based aircraft fleet mix at the Airport, which totals 130 aircraft:

- 114 single engine (SE)
- 2 multi-engine (ME)
- 0 jets
- 2 helicopters
- 12 other (ultralights, including gyrocopters)

In comparison, the FAA Airport Master Record (Form 5010), updated in late June 2013, presently reports 102 SE, 1 ME, 2 helicopters, and 12 ultralights for a total of 117, which is lower than the master plan estimate of 130 based aircraft.

The estimated airport operations total 60,000 annually, which is lower than the FAA-reported 75,500 operations. However, FAA figures are considered inaccurate as the FAA reported increases in operations during the recession while similar airports reported decreases. The FAA defines airport operations by specific categories. For Scappoose, the operations fall into one of three of these categories-- air taxi, GA, and military. Airport users in these categories include corporate, private GA, government agencies, scheduled cargo, and the occasional cargo and/or

passenger charter/air taxi. GA aircraft operations are estimated to represent nearly 92.7% of total annual operations at the Scappoose, while air taxi operations represent 6.6% and military at 0.7%.

Airport operations are also divided between local and itinerant activity. Local operations refer to aircraft remaining near the airport and include training activity such as touch-and-go operations and aircraft maneuvers in a practice area near the airport. Itinerant activity refers to all other operations that depart to or arrive from another airport. Itinerant operations make up the majority of the GA operations at 57% of the total GA while local operations represent 43% of total GA.

The majority of aircraft operations at the Airport consist of small, single-engine piston fixed wing aircraft, but multi-engine pistons, turboprops, helicopters, and jets also operate at Scappoose. According to IFR records, jet aircraft operations have been low. Airport users indicated that while helicopter traffic was frequent in the past, their operations have dropped since helicopter training at the Airport was discontinued. Most helicopter traffic today comes from Hillsboro.

Air traffic is heaviest during special events such as fly-ins. The largest events at Scappoose include Wings and Wheels and the Antique Airplane Association Fly-in.

EXISTING FACILITIES

The Airport, at an elevation of 58 feet mean sea level (MSL), consists of approximately 196 acres. However, the FBO, Transwestern Aviation, is located outside the Airport boundary, but accesses the Airport as part of a through-the-fence agreement (TTF). Existing facilities are depicted on **Exhibit 2B** and described here within three primary categories: airside, landside, and support facilities.

AIRSIDE FACILITIES

Airside facilities include active aircraft movement areas such as the runways, taxiways, and aircraft apron areas. The Scappoose Industrial Airpark has a single runway, two full-length parallel taxiways to serve the east and west side development of the Airport, and aircraft apron areas on the east and west sides.

RUNWAYS

The Airport's single runway is at a northwest-southeast alignment-- designated as Runway 15-33—with dimensions of 5,100 in length by 100 feet wide.

EXISTING FACILITIES

KEY	DESCRIPTION	KEY	DESCRIPTION
A	FBO Transwestern Aviation	L	Columbia Aviation
B	FBO Building / Storage	M	T-Hangars
C	Shed Hangars	N	Sport Copter
D	NW Antique Airplane Club	O	Oregon Aero
E	Composites Unlimited	P	Oregon Aero
F	T-Hangars	Q	Sherpa Aircraft
G	T-Hangars	R	T-Hangars
H	Overall Aircraft Services	S	Fuel Island
I	Rotating Beacon	T	Wind Indicator and Segmented Circle
J	Storage Shed	U	Oregon Aero
K	Electrical Building		

APRON
APRON
AIRPORT RD.
TAXIWAY A
REIL
PAPI
RUNWAY 15-33 (5,100' X 100')
TAXIWAY B
PAPI
LOCALIZER ANTENNA
SKYWAY DR.
ASOS
APRON (440' X 325')
N
0 250 500
Feet

LEGEND

- AIRPORT PROPERTY LINE
- PAPI — PRECISION APPROACH PATH INDICATORS
- REIL — RUNWAY END IDENTIFIER LIGHTS
- ASOS — AUTOMATED SURFACE OBSERVING SYSTEM

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SCAPPOOSE INDUSTRIAL AIRPARK

AIRPORT MASTER PLAN UPDATE

Existing Conditions Map

EXHIBIT 2B

WHPacific 9755 SW BARNES RD. STE 300 PORTLAND, OR 97225 503.626.0455

Airport users have described winds as equally distributed from the north and south with Runway 33 as the primary runway during the summer and Runway 15 during the winter.

TAXIWAYS

Two full-length parallel taxiways serve Runway 15-33. Parallel Taxiway A is on the east side of the runway with 240 feet from runway to taxiway centerline. Taxiway B is on the west side at 225 feet between centerlines at the north end and 240 feet at the south end. Both parallel taxiways are 35 feet wide.

As shown on Exhibit 2B, Taxiway A has six connecting taxiways to the runway and Taxiway B has five. From north to south, the Taxiway A connectors are designated as A1 through A6. Taxiway B connectors are designated in a similar manner beginning with B1 at the north end. All Taxiway A connectors—with the exception of Taxiway A3—align with Taxiway B connectors. A1 and Taxiway B connecting taxiways are 50 feet wide, but all other connecting taxiways are 35 feet.

There are also 50-foot wide connecting taxiways between the apron areas and parallel Taxiway A.

APRONS AND AIRCRAFT PARKING

The largest aircraft apron area is on the west side of the Airport with dimensions of 440 by 325 feet or nearly 15,900 square yards. There are 30 tiedowns on the apron, which serve small transient aircraft and based aircraft.

A smaller aircraft apron, located on the east side of the Airport provides eight tiedowns for small aircraft.

There is no officially designated helipad or heliport on the airfield so helicopters may arrive on a runway approach and hover-taxi to the apron, but Airport users indicated that helicopters also use the taxiway.

PAVEMENT CONDITION AND STRENGTH

Runway 15-33, Taxiways A and B, connecting taxiways, taxilanes, and aircraft apron areas all have asphalt concrete surfaces. Runway 15-33 has a pavement strength rating of 30,000 pounds single wheel loading (SWL), 50,000 pounds dual wheel loading (DWL), and 90,000 pounds dual tandem wheel loading (DTW).

A Pavement Evaluation / Pavement Management Plan was prepared for Scappoose Industrial Airpark in October 2012.[1] Area-weighted average Pavement Condition Indexes (PCI) and Pavement Condition Ratings (PCR) were calculated for each pavement section, based on data collected during visual inspections in the summer of 2012 (**Exhibit 2C**). Micro PAVER software was utilized to model projected pavement deterioration rates and create a pavement maintenance and rehabilitation plan for the Airport.

The most recent pavement maintenance work at Scappoose Industrial Airpark consisted of a series of crack seal treatments in 2009 (**Exhibits 2D and 2E**). While most pavement sections are rated in good to fair condition, there are a few areas that have experienced deterioration to the point that reconstruction is required. Current pavement condition ratings for individual sections are illustrated in Exhibit 2C. The area-weighted average PCI for all airport pavements is 80, with an overall PCR of "satisfactory." Pavement condition index scores of individual sections range from 4 to 100. The primary types of pavement distress observed included longitudinal and transverse cracking, block cracking, alligator cracking, and raveling. Isolated instances of depressions and weathering were also observed.

AIRFIELD LIGHTING AND SIGNAGE

Installed in 2000, Runway 15-33 is equipped with a medium intensity runway lighting (MIRL) system, which is working properly. A Runway End Identifier Lighting (REIL) system is on both runway ends.

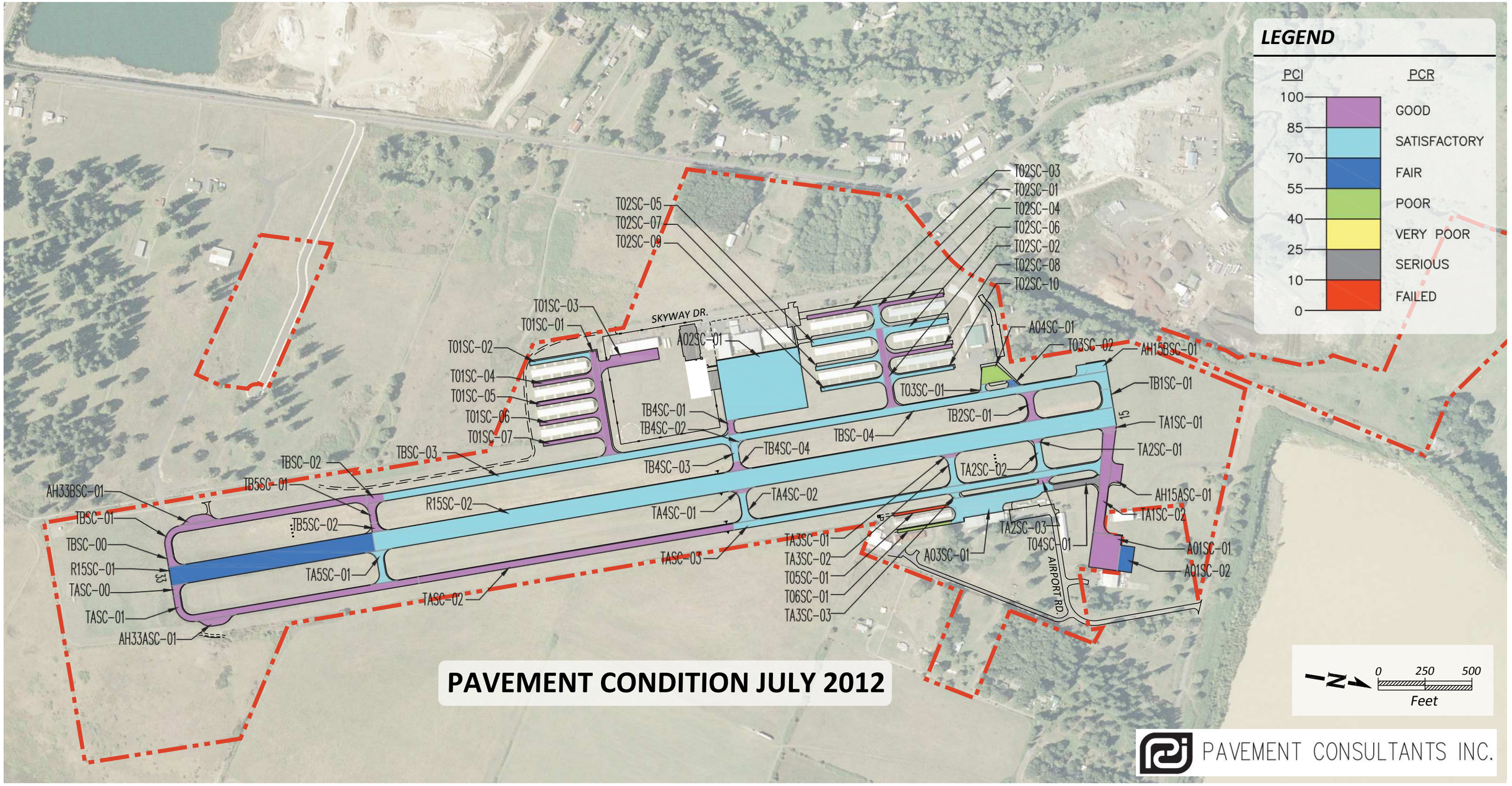
Taxiway pavements are equipped with centerline reflectors. However, an estimated 50 percent of the reflectors are gone, chipped or faded. There are blue lights at the connecting taxiway exits off the runway.

Runway and taxiway signs include holding position, exit and destination signs. These signs are located at each connector taxiway described above and along the runway at the A-4 and B-4 connector. In the fall of 2013, these signs were replaced with new LED equipment.

AIRPORT NAVIGATIONAL AIDS

Airport navigational aids include both visual and instrument approach aids. The Airport's visual aids include a rotating beacon, wind indicators, and a four-box Precision Approach Path Indicator (PAPI) system on both runway ends.

[1] Pavement Evaluation / Maintenance Management Program 2012, Scappoose Industrial Airpark. Prepared for the Oregon Department of Aviation by Pavement Consultants Inc.



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SCAPPOOSE INDUSTRIAL AIRPARK

AIRPORT MASTER PLAN UPDATE

PCI MAP

EXHIBIT 2C

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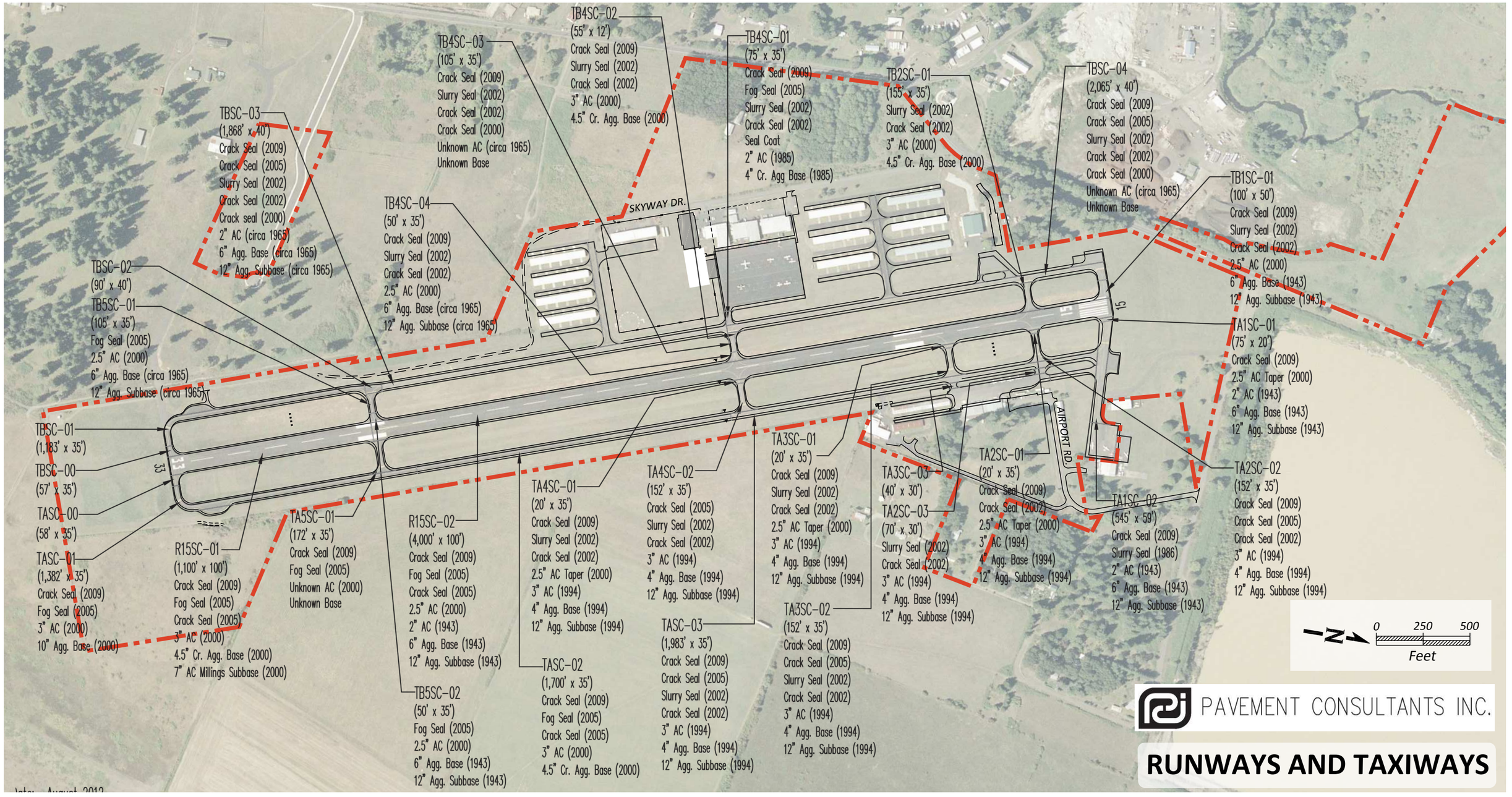

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RUNWAYS AND TAXIWAYS

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SCAPPOOSE INDUSTRIAL AIRPARK
AIRPORT MASTER PLAN UPDATE

HISTORICAL PAVEMENT INFORMATION

EXHIBIT 2D

WHPacific 9755 SW BARNES RD. STE 300 PORTLAND, OR 97225 503.626.0455

T02SC-08
(350' x 20')
T02SC-02
(425' x 35')
T02SC-05
(350' x 35')
Crack Seal (2009)
Crack Seal (2005)
Crack Seal (2002)
Fog Seal (2000)
Crack Seal (2000)
2" AC (1986)
4" Cr. Agg. Base (1986)

T02SC-01
(130' x 35')
T02SC-04
(350' x 20')
Crack Seal (2009)
Crack Seal (2005)
Crack Seal (2002)
Fog Seal (2000)
Crack Seal (2000)
2" AC (1992)
4" Cr. Agg. Base (1992)

A04SC-01
(140' x 90')
Crack Seal (2005)
Slurry Seal (2002)
Crack Seal (2002)
2" AC (circa 1965)
6" Agg. Base (circa 1965)
12" Agg. Subbase (circa 1965)

T03SC-01
(40' x 25')
T03SC-02
(40' x 35')
Crack Seal (2009)
Crack Seal (2005)
Slurry Seal (2002)
Crack Seal (2002)
2" AC (circa 1965)
6" Agg. Base (circa 1965)
12" Agg. Subbase (circa 1965)

T01SC-03
(325' x 60')
Fog Seal (2000)
Unknown AC (2000)
Unknown Base

T02SC-03
(350' x 20')
Crack Seal (2009)
Crack Seal (2005)
Fog Seal (2000)
Crack Seal (2000)
2" AC (1992)
4" Cr. Agg. Base (1992)

T02SC-06
(350' x 35')
T02SC-07
(350' x 20')
Crack Seal (2009)
Crack Seal (2005)
Fog Seal (2000)
Crack Seal (2000)
2" AC (1986)
4" Cr. Agg. Base (1986)

T01SC-01
(560' x 35')
Crack Seal (2009)
Crack Seal (2005)
Crack Seal (2002)
Fog Seal (2000)
2" AC (1992)
4" Cr. Agg. Base (1992)

T01SC-02
(325' x 20')
Crack Seal (2009)
Crack Seal (2005)
Crack Seal (2002)
Fog Seal (2000)
Unknown AC
Unknown Base

SKYWAY DR.

AH15BSC-01
(160' x 55')
Crack Seal (2009)
Slurry Seal (2002)
Crack Seal (2002)
Unknown AC (circa 1965)
Unknown Base

T01SC-04
(325' x 20')
Crack Seal (2009)
Crack Seal (2002)
Fog Seal (2000)
2" AC (1992)
4" Cr. Agg. Base (1992)

T01SC-05
(325' x 20')
Crack Seal (2002)
Fog Seal (2000)
2" AC (1992)
4" Cr. Agg. Base (1992)

AH33BSC-01
(150' x 40')
Fog Seal (2005)
3" AC (2000)
10" Cr. Agg. Base (2000)

15

AH15ASC-01
(100' x 60')
Crack Seal (2009)
Crack Seal (2005)
Fog Seal (2000)
Crack Seal (2000)
3" AC (1994)
4" Agg. Base (1994)
12" Agg. Subbase (1994)

33

AIRPORT RD

T02SC-10
(340' x 20')
Crack Seal (2005)
Fog Seal (2000)
2" AC (1986)
4" Cr. Agg. Base (1986)

T05SC-01
(295' x 15')
T06SC-01
(290' x 15')
Unknown AC (1965?)
Unknown Base

A03SC-01
(565' x 110')
Crack Seal (2005)
3" AC (1994)
4" Agg. Base (1994)
12" Agg. Subbase (1994)

A01SC-01
(187' x 154')
Crack Seal (2005)
Slurry Seal
Slurry Seal (1986)
2" AC (1943)
6" Agg. Base (1943)
12" Agg. Subbase (1943)

A01SC-02
(137' x 76')
Crack Seal (2002)
3" AC (1994)
4" Agg. Base (1994)
12" Agg. Subbase (1994)

T01SC-06
(325' x 20')
Crack Seal (2009)
Crack Seal (2005)
Fog Seal (2000)
2" AC (1992)
4" Cr. Agg. Base (1992)

T01SC-07
(325' x 20')
Fog Seal (2000)
2" AC (1992)
4" Cr. Agg. Base (1992)

A02SC-01
(440' x 325')
Crack Seal (2009)
Crack Seal (2005)
Fog Seal (2000)
2" AC (1985)
4" Cr. Agg Base (1985)

T02SC-09
(340' x 20')
Crack Seal (2009)
Crack Seal (2005)
Fog Seal (2000)
2" AC (1986)
4" Cr. Agg. Base (1986)

T04SC-01
(250' x 30')
Slurry Seal (1986)
2" AC (circa 1965)
6" Agg. Base (circa 1965)
12" Agg. Subbase (circa 1965)

AH33ASC-01
(150' x 40')
Crack Seal (2009)
Fog Seal (2005)
3" AC (2000)
10" Cr. Agg. Base (2000)

N
0 250 500
Feet

PAVEMENT CONSULTANTS INC.

APRON AND HANGAR AREAS

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SCAPPOOSE INDUSTRIAL AIRPARK
AIRPORT MASTER PLAN UPDATE

HISTORICAL PAVEMENT INFORMATION

EXHIBIT 2E

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The beacon—located on the east side of the airfield, south of the building area—is in good operating condition. There are two lighted wind indicators on the west side of the airfield—one near Runway 15 end, and one midfield. A third wind indicator, which is not lighted, is located on the east side of the airfield near the FBO facilities at the north end of the Airport. The PAPI system on Runway 33 is in good operating condition. The Runway 15 PAPI system was taken out of service pending the removal of obstructing trees to the north. The PAPI systems are POSH owned.

Instrument approach aids include the equipment associated with the Airport's instrument approaches. Instrument approach procedures can be used when the visibility and cloud ceiling are below minimums for Visual Flight Rules (VFR) conditions. The instrument approach procedures published for Scappoose are as low as one mile.

Instrument approach procedures published for the Airport include the following[2]:

- RNAV (GPS) RWY 15
- LOC/DME RWY 15
- VOR/DME-A

AUTOMATED SURFACE OBSERVING SYSTEM (ASOS)

The Airport has an Automated Surface Observing System (ASOS). The purpose of an ASOS is to provide weather conditions for an airport with updates on an hourly basis or when weather conditions change significantly. An ASOS is operated and controlled primarily by the National Weather Service, but in cooperation with the FAA and Department of Defense (DOD).

The ASOS is located on the west side of the Airport, south of the building area. The ASOS can provide weather information on a 24/7 basis through a frequency or call in.

LANDSIDE FACILITIES

Landside refers to facilities such as aircraft storage hangars, airport maintenance facility, fuel storage, vehicle access, and parking. The Airport's landside facilities are located on both sides of the airfield. Aviation services provided at the Airport are also addressed in this section.

[2] RNAV (Area Navigation) is a method of navigation that allows aircraft to choose any course within a network of navigation beacons, rather than navigating directly to and from the beacons. GPS (Global Positioning System) is a space-based global navigation satellite system. LOC (Localizer) provides runway centerline guidance to aircraft. DME (Distance Measuring Equipment) used to measure the slant range distance of an aircraft from the DME navigational aid. VOR/DME (very high frequency omnidirectional radio range / distance measuring equipment) is a type of radio navigation system.

HANGARS

Based aircraft and some limited transient aircraft utilize hangars for aircraft storage at the Airport. Private aircraft owners as well as businesses occupy hangar space at the Airport.

Hangars typically consist of various types and sizes of conventional box hangars as well as T-hangars, which make up the vast majority of aircraft storage spaces at Scappoose. According to the POSH, they have 120 T-hangar units and all are presently filled. There are 10 banks of T-hangar buildings on the west side with 10 units in each for a total of 100 T-hangar units. On the east side, there are 15 T-hangar units. A five-bay shed hangar unit, which is in poor condition, is also on the east side.

Most of the business tenants at the Airport also use hangars or a combination of office building space and hangars. These business tenants may be storing newly built aircraft, transient aircraft, or based aircraft. Business tenants with aircraft storage capability include Columbia Aviation, Composites Unlimited, Oregon Aero, Overall Aircraft Services, Sherpa Aircraft Manufacturing, and Sport Copter, and Transwestern Aviation—locations identified previously on Exhibit 2B.

OTHER BUILDINGS

The NW Antique Airplane Club is also a tenant with facilities on the Airport, previously shown on Exhibit 2B, but they do not provide aircraft storage.

A small electrical building is located on the east side next to the rotating beacon tower.

AVIATION SERVICES/FIXED BASE OPERATIONS

One business at the Airport presently provides Fixed Base Operator (FBO) services to Airport users. The FBO, TransWestern Aviation, is located just outside the Airport property owned by the POSH, but accesses the Airport with a through-the-fence (TTF) agreement. According to www.AirNav.com, TransWestern Aviation, as the FBO, offers the following services:

- Aviation fuel (100LL, Jet A)
- Aircraft parking (ramp or tiedown)
- Pilot supplies
- Courtesy transportation
- Public telephone
- Restrooms
- Camping on site

The TransWestern Aviation website also indicates that it provides courtesy cars, showers, a conference room, and charter air service from Norton Aviation LLC.

There are other businesses at the Airport providing a range of aviation-related services. Some of these business tenants include the following:

- Columbia Aviation Center – aircraft maintenance and flight training
- Composites Unlimited – manufacturing of composite aircraft components
- Oregon Aero Inc. – manufacturing of aircraft seats, helmets, & accessories
- Overall Aircraft Services (aka Evergreen Aviation) – aircraft restoration and parts
- Sherpa Aircraft – manufacturing of Sherpa airplanes
- Sport Copter – gyroplane manufacturing and flight instruction

FUEL STORAGE

The FBO sells both 100LL and Jet A fuel. There are two underground fuel storage tanks located next to TransWestern. Each tank has a 10,000-gallon storage capacity for each fuel type.

VEHICLE ACCESS AND PARKING

Access to the main Airport entrance is off Honeyman Road, which leads to Skyway Drive–the interior airport road on the west side. The secondary access into the Airport on the east side is off Moore Road; this interior access road is Airport Road.

The primary public auto parking areas for visitors are adjacent to Columbia Aviation on the west side and TransWestern on the east side. The Columbia Aviation parking area consists of 22 parking spaces, including one disability parking space. The Transwestern parking area consists of an estimated 17 parking spaces as many of the markings are faded. Other parking available is adjacent to several Airport tenant facilities as follows:

- Other west side public parking: 28 spaces. These spaces consist of 10 general parking spaces outside the gate adjacent to the corner of the Sport Copter building which is often used by Sport Copter and Oregon Aero visitors, 16 general parking and two handicapped parking spaces on the west side of the Sherpa building.
- Other east side public parking: 31 spaces plus numerous parking spaces available in the grass. Paved parking is available next to the NW Antique Airplane Club facilities and extending southward to nearby tenants.
- Restricted access parking areas on the west side: 32 spaces. Auto parking is available adjacent to the Sport Copter and Oregon Aero buildings on the aircraft apron side of the buildings. Note: Additional parking adjacent to a newly constructed Oregon Aero building was also completed during the master planning study.

There are four restricted access gates at the Airport—three on the west side and one on the east side. On the west side, a gate is located just south of the Sherpa parking area providing access to the four banks of T-hangars at the south end of the building area and one (both a vehicle and pedestrian gate) adjacent to Columbia Aviation. Another gate is located near and provides access to the Sportcopter building. On the east side, a gate is located near the FBO (TransWestern) facilities.

AIRPORT SUPPORT

Airport Support briefly addresses emergency services, airport maintenance, fencing, utilities and drainage.

EMERGENCY SERVICES

The City of Scappoose Police Department provides law enforcement support for the Airport.

Aircraft rescue and firefighting services are provided by the Scappoose Fire Protection District. The closest fire station is two miles from the Airport with an estimated response time of less than eight minutes.

AIRPORT MAINTENANCE

The Port of St. Helens typically provides routine airport maintenance with POSH equipment, vehicles, and staff, but contracts for such services on an as-needed basis. There is no maintenance facility on the Airport so all equipment and vehicles that support Airport maintenance are stored off site.

FENCING

Perimeter fencing—consisting of 3-strand barbed wire on chain link or metal posts—encompasses the majority of the Airport. The largest area without fencing is on the east side. The fencing is in fair condition. The fencing and restricted access gates enhance security. The presence of staff at the FBOs and other businesses also enhances security.

UTILITIES

Utilities at the Airport are briefly discussed here and include: water, sewer, natural gas, electric, and telecommunications.

Water
Water service is provided by the City of Scappoose through an 18" main in West Lane and a 12" main along Skyway Drive.[3] (**Exhibit 2F**)

Sewer
Onsite sanitary sewer disposal is via septic systems. The municipal sewer system runs southwest of the runway. Sewer lines run parallel to the southernmost portion of Taxiway B (B6), approximately 150 feet west of Taxiway B6. The closest storm drainage sewer is also located southwest of the runway. (Exhibit 2F)

The *Port of St. Helens Strategic Business Plan* (2012) states the POSH's intention to work with the City of Scappoose to extend sewer lines to allow for future east side expansion.

Natural Gas
The local natural gas provider is Northwest Natural Gas. Natural gas service currently does not extend to the Airport site. However, a high-pressure natural gas line is located approximately 1.5 miles away from the Airport site, should there be interest in seeking a gas main extension in the future.[4]

Electrical[5]
Electrical Power is provided by Columbia River People's Utility District (CRPUD). The Airport is connected to 3-phase power, transmitted via a combination of overhead and underground lines:

- Overhead primary lines extending along West Lane Road
- Overhead primary lines transition into underground primary lines along North Honeyman Road
- Series of overhead primaries along Moore Road, Airport Road and Ring Road connect and travel east
- Underground primary along West Lane Rd extends east to connect to Airport facilities, and south (parallel to southern driveway)

[3] Size of water mains quoted from *Port of St. Helens, Infrastructure Assessment* (Revised March 23, 2012), LCE Project #1799, presented as Appendix B of the Port of St. Helens Strategic Business Plan, August 2012.
[4] *Port of St. Helens, Infrastructure Assessment* (Revised March 23, 2012), LCE Project #1799, presented as Appendix B of the Port of St. Helens Strategic Business Plan, August 2012
[5] Ibid

Telecommunications
Comcast is the Airport's telecommunications and broadband Internet service provider. The *Port of St. Helens Strategic Business Plan* (2012) states the POSH's intention is to improve broadband service to the Airpark.

DRAINAGE

The Airport grade slopes generally from north to south, with stormwater conveyed by inlets and culverts to open fields, drainage ditches, and a few water quality swales. The Airport's runway is a shed section sloping to the east. The west side of the Airport has two recent water quality swales constructed for the new hangar and the west parking lot (by Columbia Aviation). There are no direct stormwater discharges to any local streams or rivers.

ENVIRONMENTAL INVENTORY

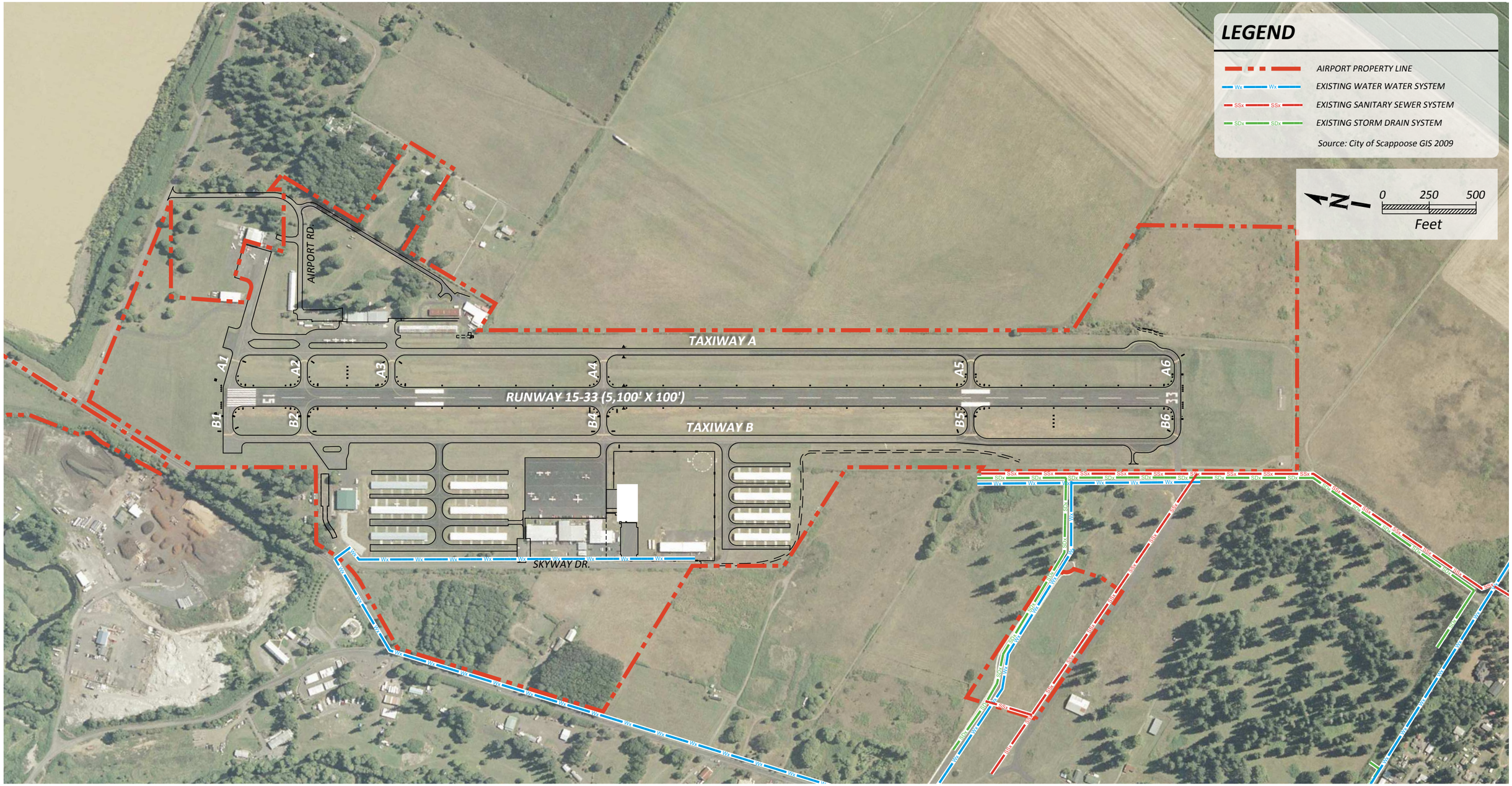
The Airport property is bounded on the north by Honeyman, Moore and Airport Roads. The eastern and southern edges of the Airport abut agricultural properties, while the west side of the Airport abuts property used for residential and airport-industrial uses. The purpose of this section is to summarize the environmental setting of the Airport, and identify any potential environmental constraints.

Environmental constraints for airports typically fall into two general categories: human environment and natural environment. Human factors that can constrain airports include existing settlements and incompatible land use, noise, social or socioeconomic conditions, light and glare, and the general controversial nature of airports. Natural environmental elements include various aspects of air quality, water resources, fish and wildlife, hazardous materials, energy and other resource issues.

HUMAN FACTORS

NOISE

The Airport currently supports about 60,000 annual operations, mostly single engine aircraft. The typical threshold of concern is when the 65 DNL contour extends over noise-sensitive land uses. Noise contours typically mirror the shape of the runway, and extend beyond the runway ends in the dominant take-off direction. For the runway extension completed in 2000, the noise model, based on 57,000 annual operations, showed the 65 DNL contour just outside of the Airport boundary, on agricultural land to the south and over the road on the north.



PORT OF ST. HELENS
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SCAPPOOSE INDUSTRIAL AIRPARK

AIRPORT MASTER PLAN UPDATE

Existing Utilities

EXHIBIT 2F

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Areas north, east and west of the Airport include agricultural and industrial uses, and would not be considered noise-sensitive. Land off the southern end of the Airport has been developed in relatively dense single and multi-family housing, much of which appears to be relatively new.

Another threshold of significance is 90,000 annual adjusted propeller operations. The current usage of the Airport is far from this level.

The developed area of Scappoose, including Scappoose High School, is about a mile and a half from the Airport, and noise associated with the Airport is not an issue. The area surrounding the Airport is primarily in agricultural use, including grazing and cultivated cropland. There are a few residences, however there have not been any noise issues associated with the Airport in recent history.

LAND USE

The Columbia County zoning map designation for the Airport property is "AI-Airport Industrial." Airports are permitted outright in this zone, as are aircraft repair and manufacturing uses. Airport-related guest services (motel, restaurant, rental car) fall under the conditional use category. Additional conditional uses are primarily manufacturing uses that are required to be air-shipped, and manufacturing of equipment considered secondary to aircraft manufacturing (e.g. navigation instruments). It's important to note that although some of the land near the airport is governed by Columbia County, the airport itself and the land to its west is in City Limits and is zoned Public Use Airport (PUA).

The Airport and areas subject to Part 77 airspace restrictions are part of an Aircraft Landing Field Overlay Zone. This overlay restricts height, building emissions, and other land uses that may interfere with airport operations. It also restricts uses that may otherwise be deemed incompatible with an airport.

SOCIAL IMPACT AND INDUCED SOCIOECONOMIC ISSUES

Social impacts are typically related to relocation of businesses, residences or the alteration of established patterns of life (e.g. roadway changes, new facilities that divide a community, et cetera.) Access to the Airport from U.S. Highway 30 is relatively easy. The Airport has some available land for development, and there is an industrial park along the southwest edge of the Airport (without direct airport access). The Airport is currently home to an FBO, and several aviation-related businesses including aircraft or aircraft equipment manufacturers. Relocations of homes or businesses are not likely as an outcome of this Airport Master Plan.

Columbia County does not have a major hospital or emergency medical center. The Airport also provides medical evacuation services from the area to major medical centers for critical cases.

Socioeconomic issues include the potential for the Airport to continue providing economic attraction to the community, including on-airport jobs, off-airport jobs that are supported by the Airport, or some attraction that provides incentive to use the Airport. The Airport provides some positive economic benefit to the community through flight training, aircraft repair, as well as being home to numerous aviation-related business tenants. In recent years, the Airport has become an alternative to Hillsboro for aircraft owners and pilots wishing to avoid the congestion there.

Environmental Justice is a specific aspect of socioeconomic impact that addresses whether a facility places a disproportionate burden on a population that is otherwise subject to perceived discrimination or other burden, for example a low-income or ethnic minority community. There do not appear to be populations meeting the definition within the immediate Airport vicinity.

HISTORIC PROPERTIES, CULTURAL RESOURCES (SECTION 106 RESOURCES)

The Airport was developed as an emergency airstrip during World War II. After World War II ended, the Airport was acquired and operated, first by the County, and later by the Port of St. Helens, as a public airport. The subject site has been disturbed during the construction of the initial airport as well as construction of private hangars and other structures. During excavation for these activities, no artifacts were found.

An archaeological, historical and cultural resources review was prepared in 1998 when the runway was extended 1,100 feet to the south. No artifacts were found and no sensitive resources were identified in the Airport vicinity.

RECREATIONAL LANDS (SECTION 4(F)) RESOURCES

Section 4(f) requires that transportation projects limit their impact on public recreation. There is one small public playground/park about 0.6 miles from the south end of the runway, near the intersection of Miller and Heron Meadows roads. There is a public RV park at the north end of the Airport. Other recreation opportunities are on the Columbia River, about two miles east of the Airport, and in Scappoose, about 1.5 miles from the Airport.

WILD AND SCENIC RIVERS

There do not appear to be any designated or candidate Wild and Scenic Rivers in the immediate vicinity of the Airport.

FARMLAND PRESERVATION

Certain types of soils are considered prime farmland because of their drainage, mineral, and other characteristics. These soils, when in urbanized or developed areas, are not considered prime due to the compaction and other activities that degrade the potential for farm use. The Natural Resources Conservation Service on-line soil database map (Soil Survey of Columbia County, Oregon) found one soil type in the Airport are, Unit 51 – Sifton Loam.

Sifton Loam is considered prime farmland, with a capability level of 3s (irrigated or non-irrigated). Within the Airport property, compaction and alteration of the land for airport construction and operation may have altered the makeup and properties of the soil.

FAA Guidelines state that the Farmland Protection Policy Act (FPPA) is not applicable and no formal coordination with the Natural Resource Conservation Service (NRCS) is required if any of the following conditions apply:

- The land was purchased prior to August 6, 1984, for purposes of being converted.
- Acquisition does not directly or indirectly convert farmland (e.g., land acquired for clear zones or noise compatibility). Indirect conversion includes any use of land or operation of the facility which would prohibit the land from being farmed.
- The land is not prime farmland as defined in the FPPA.
- The land is not unique farmland.
- The soils are not considered prime farmland.
- The land has not been determined by a state or local government agency, with concurrence of the Secretary of Agriculture, to be of statewide or local importance.

Because the Airport is not presently acquiring property outside of its current boundary, and the current property has been in airport ownership since 1985 or prior, FPPA is not applicable at this time. However, the POSH is interested in purchasing land around the Airport, particularly on the southwest side.

LIGHT AND GLARE

On-airport lighting is focused for visibility to aviators, without creating a disturbance or distraction. Any additional facilities will need to consider the impact of light or glare, including

the use of windows or roofing material, on aviation. Residences and other sensitive receptors are located some distance from the Airport. Any additional lighting or structures will need to be focused such that light or glare is not projected into the community.

NATURAL FACTORS

AIR QUALITY

The EPA requires monitoring and corrective action for seven pollutants, including two sizes of particulate material. Areas that have consistent violations of air quality standards are considered "non-attainment." Areas that have been in "non-attainment" but have improved conditions are considered "maintenance." The Scappoose Industrial Airpark is outside of the Portland-Vancouver maintenance area for ozone and carbon monoxide.

Any construction impacts will need to consider the impact of particulate material on the local environment, including water quality and other resources. The Airport does not currently generate a significant amount of surface traffic, and that is anticipated to continue in the future. There are no "air quality hot spots" for surface transportation facilities in the Airport vicinity.

WATER QUALITY

The Airport site is in former Columbia River floodplains. There are several creeks and drainages off-airport, as well as ponds that have formed in former gravel quarry sites. The Airport sanitary sewer is presently served by septic tanks and drainfields. Stormwater is collected and infiltrated primarily via swales in the Airport infield and along the taxiways.

PLANTS AND ANIMALS, INCLUDING ENDANGERED AND THREATENED SPECIES AND ESSENTIAL FISH HABITAT

The Airport is located within the Columbia River Valley. Historically, the Airport area was part of the Columbia River floodplain and has been used for cropland, grazing, and for gravel mining. The location, along with the abundant water features (the river, quarry ponds) makes it an important area for migrating and wintering waterfowl. Geese and other waterfowl benefit from the river, its islands, and the ponds.

The Airport is almost immediately west of the Ridgefield National Wildlife Refuge, in Washington. The area provides vital winter habitat for Canada geese and other wintering waterfowl. Sandhill cranes, shorebirds, and a variety of songbirds use the area around the Refuge and the Airport

during spring and fall migrations. Some species, such as mallards, great blue heron and red tailed hawks are year round residents of the area. Black tailed deer, coyote, raccoon, skunk, beaver and brush rabbits have been seen in the area.

Threatened, endangered, or candidate bird species in the Airport vicinity include streaked horned lark (state candidate), peregrine falcon (federal endangered), purple martin (state sensitive), and western bluebird (state sensitive). A recent survey, which included three site visits to investigate the presence of streaked horned lark, concluded that the species was not present at the Airport. Because of the proximity to the Columbia River, salmonids are a concern as are any commercial fish species protected under the Magnuson-Stevens Act. Previous studies at the Airport show no evidence of the terrestrial species in residence.

Other species of concern include painted turtles and pond turtles (state critical), and Howell's montia (state critical plant). Observation and records searches for previous projects on the Airport show no likely presence of these species in the area.

Any development plans would require an updated review and site visit for presence and effect on these plant, terrestrial animals and fish.

On-Airport, there were rodent spoil piles and ground squirrels observed. A variety of songbirds, a red-tailed hawk and great blue herons were observed. In other visits, flocks of Canada geese have been seen on the northern runway safety area. The maintained grass of the Airport, combined with the close proximity to the Columbia River and quarry ponds, provides an attraction for Canada geese and other large. The grassy habitat supports small mammals, which attracts raptors to the area as well.

The FAA wildlife strike database does not have any entries for Scappoose. However, the FAA funded a Wildlife Hazard Site Visit (WHSV) in mid-2014 for the Airport to comply with current environmental regulations. The WHSV has been completed and is currently under review by the FAA. The report recommends that the Port prepare a Wildlife Hazard Management Plan (WHMP) to deal with the few issues on and around the airport. The WHMP should be completed in 2015.

The Scappoose Industrial Airpark property includes site conditions typical of an airport facility, in regards to the maintenance of the grounds and vegetation. Existing vegetation includes a mixture of invasive and native species, predominantly made-up of grasses. An extensive mowing schedule maintains all vegetation for airport safety and visibility as required by FAA regulations.

Any activity on the Airport would need to consider impacts to these species under the Endangered Species Act as well as habitat impacts under the Magnuson-Stevens Act.

WETLANDS AND FLOODPLAINS

The Airport does not appear to have any wetlands on-site. Drainageways appear to be working well due to the gravelly nature of the soils, and there is no evidence of long-term standing water-like characteristics. At the time of any development action, a formal wetland determination may be prepared, if and when needed.

The majority of the Airport is shown on FIRM Map 41009C0463D as being outside of any designated flood areas. The southern end of the runway, east taxiway, and runway safety area are shown as within "the 1% annual chance or greater flood hazard zone," but is protected by a provisionally accredited levee system. Additional information regarding the potential impact of FEMA Dike Certification requirements on the Airport is provided on page 22.

ENERGY SUPPLY AND NATURAL RESOURCES:

This category focuses on the impact of airport actions on energy and natural resources used in construction materials. In general, construction materials are not in short supply. Fuel for construction equipment is available nearby. The site has adequate electrical supply to provide power to navigation aids and security lighting on the Airport.

SOLID WASTE

Typically, general aviation airports do not generate significant amounts of solid waste. Often materials include food and beverage containers, or packaging for aircraft maintenance products. Food containers may create a bird and rodent attractant.

During construction, pavement materials are often recycled into the new pavement, reducing the need for disposal.

Plans for future activity at the Airport should consider the manner in which waste is collected and removed.

HAZARDOUS MATERIALS

The Airport has one privately owned off-Port property commercial fueling site. There is potential for additional contamination anywhere maintenance or fueling takes place, as a result of accidental spills.

In addition to fueling, aircraft maintenance activities may also have contributed to spills. No detailed exploration of spill or contamination history has occurred on the Airport. Any such areas where construction is proposed would need to undergo some level of due diligence, such as a "Phase One Environmental Site Assessment" to identify any history of possible contamination.

CONSTRUCTION IMPACTS

Construction impacts typically include temporary noise, dust or traffic impacts, as well as the potential for erosion and water quality impacts associated with material spills, associated with construction. Once construction activities are identified, construction timing, phasing and mitigation measures need to be considered.

CONTROVERSY

Controversy is typically associated with off-airport impacts. In the case of Scappoose Industrial Airpark, there appears to be minimal, if any, controversy surrounding the Airport.

OTHER ISSUES

There do not appear to be any other environmental-related issues on or around the Airport.

ENVIRONMENTAL CONCLUSION

There may be environmental issues on the Airport or in the Airport vicinity related to floodplains, wetlands and endangered species. Additional study regarding these issues may be conducted, if needed, once a project is defined.

AIRSPACE

For the safety of aircraft operations, it is important to protect the airspace around an airport.

The FAA-approved Airport Layout Plan (ALP) drawing set, prepared in 2004 as part of the last master plan, includes an Airspace Drawing. An Airspace Drawing illustrates the boundaries of imaginary airspace defined by the FAA. An Airspace Drawing is prepared in accordance with Title 14 Code of Federal Regulations Part 77, *Objects Affecting Navigable Airspace*, which defines a set of "imaginary surfaces" that should be protected from obstructions to air navigation, when

possible. One of the most critical of these surfaces is the approach surface to each runway. The surface extending the farthest from the Airport is approximately 10,000 feet from the non-precision instrument runway end, Runway 15.

Runway 15 uses a standard left traffic pattern while a non-standard right traffic pattern is used for Runway 33. Non-standard right traffic patterns are often implemented when area obstructions are present, community noise impacts require noise abatement procedures, special aviation activities is kept a safe distance from air traffic, environmentally sensitive areas must be avoided, or other issues need to be mitigated with traffic pattern adjustments. For Scappoose Industrial Airpark, the right traffic pattern is applied as a noise abatement procedure. With regard for two residents in the area, there is also fly-friendly noise abatement procedure around the north end of Runway 15.

Due to Portland International Airport's close proximity to Scappoose, pilots departing Scappoose must have onboard navigational and communication equipment to enter the PDX airspace. There is no special use airspace in the immediate vicinity of the Airport that restricts or limits aircraft operations. The closest Victor Airway is V112. Victor Airways are "highways in the sky" and represent corridors of protected airspace defined by radio navaids.

OFF-AIRPORT LAND USE AND DEVELOPMENT

This section identifies the existing land use designations within the vicinity of the Airport, and assesses land use compatibility, land use controls, and development projects that may impact or limit future airport development projects. During the master planning process, it is important to consider off-airport land use to ensure long-term compatibility with airport operations. In recent years, residential encroachment has restricted future growth opportunities for smaller public use airports. Airport noise levels, height restrictions for facilities, and other safety issues should be considered when planning for area land use changes.

The Oregon Department of Aviation publishes the *Airport Land Use Compatibility Guidebook,* providing guidance on compatible land uses near public and private airport facilities. The *Airport Land Use Compatibility Guidebook* (2003) identifies the following land use compatibility concerns near airports in Oregon[6]:

- **Density Development**: Restrict land density in areas where aircraft are flying at low altitudes.
- **Open Areas**: Provide an adequate open area for emergency landings.
- **Height of Structures**: Meet or exceed guidelines in FAA Regulations Part 77 regarding tall structures within airport-vicinity airspace.
- **Lights**: Avoid upward lighting that may confuse pilots during landing.

[6] Oregon Department of Aviation, *Airport Land Use Compatibility Guidebook* (2003), Sections 3.2 and 3.3

- **Smoke**: Smoke generated by industrial facilities and/or field burning can impact visibility – such facilities and/or activities should not be located within the vicinity of an airport.
- **Electronic Interference**: Land or facility uses that generate electronic transmissions are not compatible with airports, as such transmissions can interfere with navigational signals and radio communications.
- **Bird Attractants**: Land uses that attract birds, such as landfills or water impoundments, create dangerous conditions for aircraft. FAA Order 5050.4A states that bird attractants should not be located within 5,000 feet of runways accommodating piston-type aircraft, and within 10,000 feet of runways accommodating turbine (jet) aircraft.
- **Noise Impacts**: FAA Part 150 should be referenced with determining acceptable land use based on day-night average sound level (DNL).

AREA LAND USE / ZONING

The Scappoose Industrial Airpark is owned by the Port of St. Helens. The Airport is situated on a 196-acre site and zoned as Public Use Airport (PUA). Land to the west and southwest of the site falls within the City of Scappoose, whereas land to the north and east falls within Columbia County (**Exhibit 2G**). The City of Scappoose and Columbia County have defined an Airport Overlay Zone identifying airspace and runway protection zones. Some Light Industrial (LI) land is located along West Lane Road, west of the Airport. Residential housing of various types and densities are located south and southwest of the Airport, including Manufactured Housing (MH), Moderate Density Residential (R-4), and High Density Residential (A-1).[7] Airpark Development LLC owns nearly all privately-owned property adjacent to the Airport.[8]

POTENTIAL IMPACT OF FEMA DIKE CERTIFICATION REQUIREMENTS ON AIRPORT

The future certification status of the Scappoose area 9.9 mile dike is uncertain, due to new FEMA requirements requiring recertification of all dike systems based on new safety standards.[9] The Scappoose Drainage Improvement Company held a public meeting on July 8, 2013, to discuss the recertification requirements and impact to property owners. Recertifying the dike according to the updated standards will be an expensive endeavor; however, if the dike is not recertified, 750 residential homes and a number of municipal, educational and commercial buildings will be reclassified as residing in a flood zone. It is unclear whether the impacted area would include some or all of Scappoose Industrial Airpark land. If the Airport does indeed fall within the affected area, and the land is reclassified as a flood zone area, insurance requirements would likely increase for the Port of St. Helens. Additionally, it is unclear whether flood zone reclassification

[7] City of Scappoose Zoning Map – compilation date 1/28/13
[8] Portland Tribune, *Port Kicks-off Airport Master Plan Update*, March 22, 2013
[9] Portland Tribune, *Fee Would Pay for Scappoose Dike Certification*, June 14, 2013

of the land supporting the Airport runway, taxiways, buildings, aprons, and other infrastructure would compromise the Airport's ability to meet FAA requirements. Even if the central Airport infrastructure is not impacted, the reclassification of surrounding property as in a flood zone would likely deter developers from investing in the area, thereby hampering the Airpark's future expansion plans. The Port of St. Helens should continue to work closely with the Scappoose Drainage Improvement Company and other stakeholders to ensure that the dike is recertified under the new FEMA safety standards.

FINANCIAL INVENTORY

According to Port of St. Helens financial records for the Airport over the last five years, revenues have averaged $509,600 with operations and maintenance expenses combined with debt service averaging $183,700. This leaves an average positive cash flow of nearly $326,000. However, total expenses generally exceed revenues, which it did in the last five years, when the POSH funds capital improvements, larger maintenance projects, and obstruction removal. Plus, it does not account for staff time and overhead expenditures. The POSH has received grant funding to support the capital improvements at the Airport, but the POSH provides matching funds on the balance. Presently, airport sponsors with capital improvements eligible for FAA funding can receive grants for up to 90% of the total project cost.

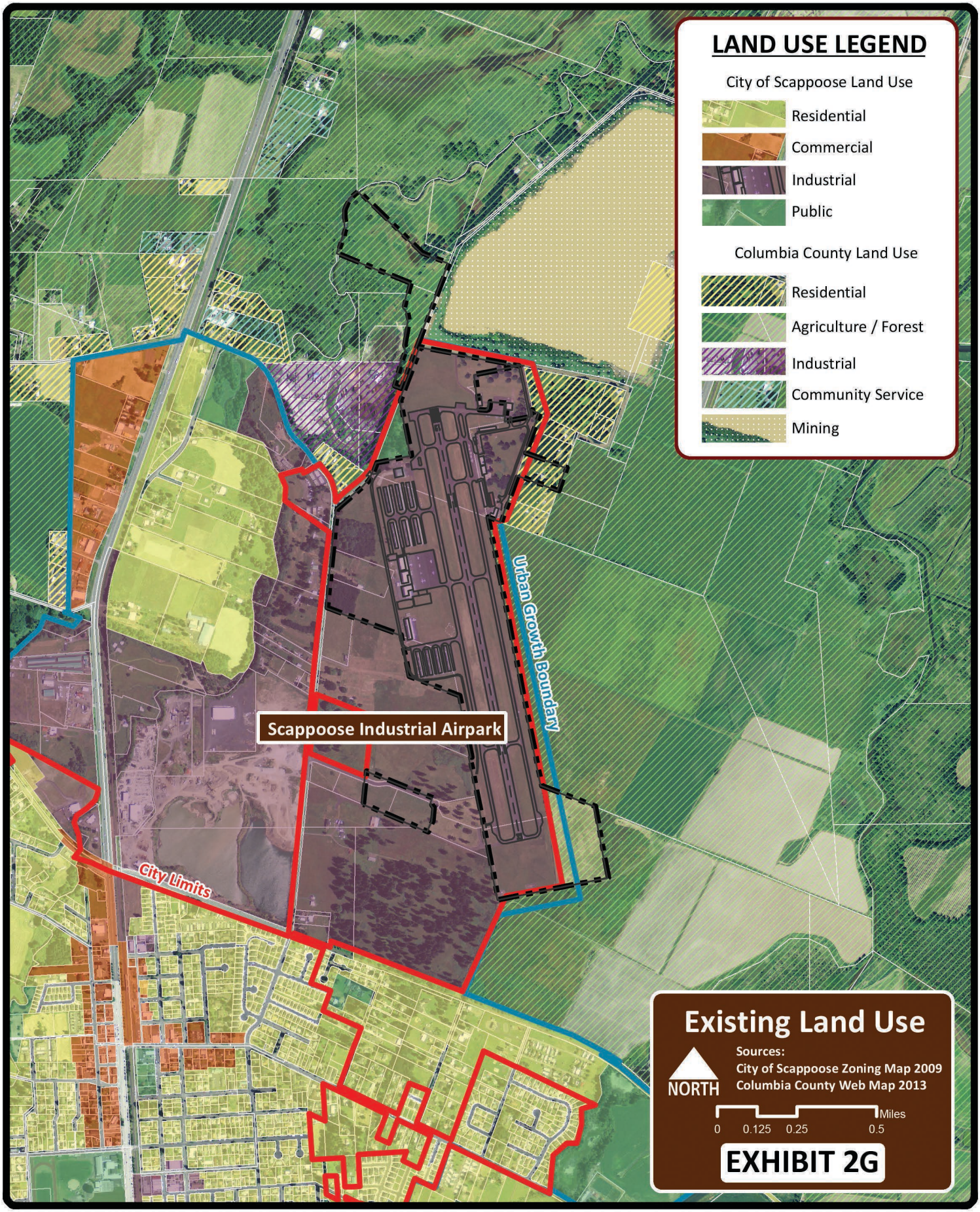
RATES AND CHARGES

The Port's rate and fee structure encompasses T-hangar rental and tiedown rates for aircraft owners, and approximate ground lease rates for commercial tenants. **Table 2A** summarizes the present airport rates and fees as of July 2013, provided by the Port. The Port performs a market analysis and considers CPI information to update the Airport's rates and fees every two years.—typically in July. The current rates will run from July 2013 to July 2015. It's important to note that lease rates may also vary based on location, amenities, market considerations and other lease terms.

Table 2A. Airport Rates and Fees for Scappoose Industrial Airpark

Description	Cost Per Month
East Open Hangar Building	$ 91
East Side 10-unit Hangar Building	$ 139
East Side 5-unit Hangar Building	$ 158
West Side Interior Hangars	$ 193
West Side End Hangars	$ 217
Tiedown	$ 31
Ground Lease (benchmark: $0.35/sf per year for bare land, or per month w/bldg)	varies

Source: Port of St. Helens, Effective July 1, 2013


LAND USE LEGEND
City of Scappoose Land Use
Residential
Commercial
Industrial
Public
Columbia County Land Use
Residential
Agriculture / Forest
Industrial
Community Service
Mining
Urban Growth Boundary
Scappoose Industrial Airpark
City Limits
Existing Land Use
NORTH
Sources:
City of Scappoose Zoning Map 2009
Columbia County Web Map 2013
Miles
0
0.125
0.25
0.5
EXHIBIT 2G

Chapter Three FORECASTS

Forecasting aviation demand helps determine the size and timing of needed airport improvements. This chapter indicates the types and levels of aviation activity expected at the Scappoose Industrial Airpark (Airport) during a 20-year forecast period. Projections of aviation activity for the Airport were prepared for the following timeframes:

- Near-term (2017)
- Mid-term (2022)
- Long-term (2032)

The primary objective of forecasting is to define the magnitude of change that can be expected over time. Because of the cyclical nature of the economy, it is impossible to predict with certainty year-to-year fluctuations in activity when looking 20 years into the future. However, a trend can be established that characterizes long-term potential. While a single line expresses the anticipated growth for each element of aviation activity, actual growth may fluctuate above and below this line. Forecasts serve only as guidelines, and planning must remain flexible to respond to unforeseen changes in aviation activity and resultant facility needs.

This chapter presents forecasts for the following components of aviation activity:

- **Based Aircraft, Including Fleet Mix.** The number and type of aircraft based at the Airport helps determine the future aircraft hangar, apron, and auto parking facility requirements. Fleet Mix refers to the distribution of aircraft by type.

- **Aircraft Operations, Including Annual, Peak, and Local vs. Itinerant.** An operation is counted as an aircraft either landing or taking off (*i.e.*, an aircraft landing then taking off counts as two operations). Local operations are touch-and-go and other training operations that stay near the airport. Air taxi, general aviation, and military aircraft operations are included. The operations forecast helps in analyzing runway capacity and determining runway, taxiway, and navigational aid requirements.

- **Critical Aircraft and Airport Reference Code.** The critical, or design, aircraft is derived from the operational fleet mix. The critical aircraft and its airport reference code determine many airfield design requirements, such as runway and taxiway size and strength, and safety clearances around aircraft movement areas.

The forecasts presented in this chapter are consistent with the Airport's role defined by the Oregon Aviation Plan 2007. As previously described in Chapter 1, Introduction, that role is an Urban General Aviation Airport.

TRENDS AFFECTING AVIATION

This section describes trends in national, state, and local general aviation activity as well as area socioeconomic trends—all of which may influence activity at the Scappoose Industrial Airpark.

NATIONAL AVIATION TRENDS

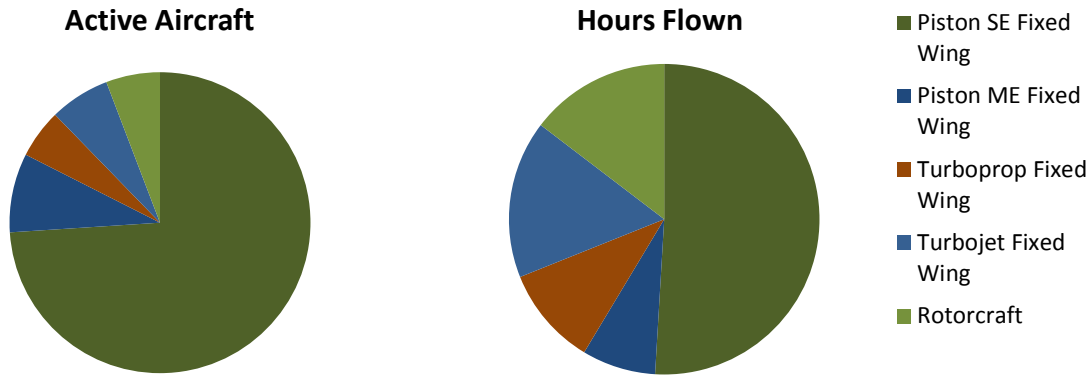
General aviation (GA) is a large and important segment of national air transportation. Reviewing national GA trends provides insight into the factors influencing its growth. GA refers to a wide range of flight activity and, by general definition, is all activity that is not commercial airline or military. GA aircraft are also widely varied, although the majority of general aviation aircraft are piston-powered, fixed wing airplanes. **Table 3A** shows the nationwide distribution of general aviation aircraft by type and hours flown, which reveals the substantial variation in hours flown between higher performance, more expensive aircraft and the piston airplanes; **Exhibit 3A** illustrates this variation.

Table 3A. U.S. GA and Air Taxi Active Fleet and Hours Flown

Aircraft Type	Active Aircraft	% Fleet	Hours Flown	% Hours Flown	Hours per Aircraft
Piston SE Fixed Wing	135,935	74.0%	11,641,551	50.9%	85.6
Piston ME Fixed Wing	15,600	8.5%	1,754,860	7.7%	112.5
Turboprop Fixed Wing	9,670	5.3%	2,357,408	10.3%	243.8
Turbojet Fixed Wing	11,890	6.5%	3,755,965	16.4%	315.9
Rotorcraft	10,665	5.8%	3,343,721	14.6%	313.5
Total	183,760	100%	22,853,505	100%	124.4
Experimental	24,410	66.1%	1,232,253	70.6%	50.5
Sport Aircraft	6,825	18.5%	330,816	19.0%	48.5
Other	5,675	15.4%	182,058	10.4%	32.1
Total	36,910	100%	1,745,127	100%	47.3

Source: FAA Aerospace Forecast 2013-2033, (dated Mar2013); figures are 2012 estimates.
SE=single engine, ME=multi-engine

Exhibit 3A. Comparison of U.S. GA and Air Taxi Active Fleet versus Hours Flown



Source: Table 3A Data

Before the economic recession, which officially started in late 2007, GA activity was stable and experiencing growth. In 2008, GA activity started to decline. Speculator-driven soaring fuel prices in mid-2008 also contributed to the decline. The recession affected all aspects of GA such as recreational activity, flight training, aircraft production, number of pilots and the hours aircraft were flown. The harm to the development of new aviation technology and businesses is exemplified by the Eclipse/DayJet story. Eclipse Aviation was the leading developer and manufacturer of the Very Light Jet (VLJ). The VLJ is a small, low-cost jet capable of using short runways and offering the speed and comfort of high-altitude jet flight. Eclipse was the first to deliver a VLJ in late 2006. DayJet, operating a fleet of Eclipse aircraft in the Southeastern U.S.,

employed a unique air taxi business model—"per seat, on-demand"—that was a radical change from the tradition of a single customer chartering a whole aircraft. DayJet ceased operating in September 2008, blaming the tight credit market for its demise. After producing 260 VLJs, Eclipse Aviation declared bankruptcy in November 2008. Fortunately, a new company, Eclipse Aerospace, purchased Eclipse Aviation's assets, restarted production in June 2012, and is anticipating its first delivery in the third quarter of 2013, according to www.eclipse.aero. While Eclipse struggled in its early years, its development ideas generated interest in the industry establishing a platform for other manufacturers to consider the possibilities to serve a growing market segment.

According to national reports, the economic recession ended in the summer of 2010; however, recovery of GA traffic since that time has been slow. The General Aviation Manufacturers Association (GAMA) has reported some good news. In 2012, worldwide shipments for general aviation airplanes increased for a second year in a row following a three-year decline. However, the increase is attributed to increased shipments in turboprops and single engine piston aircraft shipments while business jets saw a 3.4% decrease. Consequently, general aviation billings saw a slight 1% decrease due to the type of aircraft that made up the growth in shipments.

In the first quarter of 2013, optimism returned as total airplane shipments were up 9.6% over the first quarter of 2012, with growth in all segments: piston (3.8%), turboprops (26%), and business jets (4.0%). According to Honeywell's *Business Aviation Outlook,* an average annual growth rate of three to four percent is anticipated from 2012 to 2022. After surveying more than 1,500 flight departments around the world, Honeywell indicated that 30% of operators have plans to purchase a new business jet as a replacement aircraft or new addition within the next five years.

The declining trend in GA flying also ended with the most recent activity indicators showing flat or modest growth. While GA operations at air traffic control towers showed a declining trend through 2011, GA operations for 2012 increased by 0.6%. The FAA estimates that the active general aviation fleet decreased by 1.2% in 2011, and then remained unchanged in 2012. General aviation flight hours also saw a decline in 2011 and then flat growth in 2012. A long-term declining trend in the number of student pilots reversed in 2010, with a 64.8% increase, which was largely due to the FAA's issuance of a rule increasing the duration of certificates for student pilots under age 40. Two years later, 2012 figures reveal that student pilots increased 1.1% over 2011.

According to *FAA Aerospace Forecasts Fiscal Years 2013-2033*, published in March 2013, the FAA noted that the timing and strength of a recovery in aviation demand remains highly uncertain as the operational environment continues to evolve. Nevertheless, the long-term outlook remains favorable. The FAA predicts business aviation will continue to show stronger growth than the personal and recreational aviation segments as businesses consider factors such as possible commercial airline flight delays, and safety and security issues. The number of active[1] general

[1] An active aircraft is one that has a current registration and was flown at least one hour during the calendar year.

aviation and air taxi aircraft is projected to grow 0.5% annually over the next two decades. Annual growth rates vary by type of aircraft and the FAA projects that the more expensive and sophisticated turbine-powered fleet (including helicopters) will grow at an average of 2.8% annually over the next two decades; of that fleet, the turbine jets will see the strongest growth of 3.5% annually. In contrast, the piston-powered aircraft fleet is projected to decrease at 0.2% annually.

As the active aircraft fleet grows, the number of general aviation hours flown is projected to increase at 1.5% per year for the same timeframe (2033) , which is a more conservative growth rate than the 2.2% that the FAA projected just a couple of years ago. FAA annual growth rate projections vary for hours flown, from a declining rate of -0.2% for piston aircraft, to a high growth of 4.3% for jet aircraft.

The industry continues to point out that promising technological developments coupled with the economic recovery will support positive growth trends.

One of the emerging and much anticipated technological advancements is NextGen—short for Next Generation. NextGen, a national initiative, is anticipated to modernize aviation and is already being implemented by airlines and at large air carrier airports. NextGen is transitioning our air traffic management from a ground-based system to a satellite-based system—Global Positioning System (GPS).

The basic benefits of NextGen are increased airspace capacity (reduced congestion), enhanced safety and economic benefits. The economic benefit could make doing business in GA airport communities more attractive as it will handle a wide range of aircraft types and eliminate the need for costly instrument landing equipment. The Wide Area Augmentation System (WAAS) available for the last decade augments GPS to provide more precise navigational guidance. This is anticipated to provide a continued positive growth trend in business aviation activity.

As trends shift, and often in unpredictable ways, the FAA cautions that its forecasts depend on many unknown factors. Some of these factors include the national and world economies, U.S. unemployment, price of oil, and national fiscal issues.

STATE AND LOCAL AVIATION TRENDS

The primary source for discussion of state and local aviation trends is the FAA Terminal Area Forecast (TAF), Oregon Aviation Plan (OAP) 2007 and local aviation activity information and data.

According to the OAP 2007, there were 96 airports in the state airport system with an estimated 4,875 based aircraft in 2005. For comparison, the aircraft registry shows 8,264 aircraft registered in the state of Oregon in May 2013. However, the number of aircraft registered can often differ from based aircraft counts, particularly if many of the aircraft are inactive, stored at private

airfields, or spend the majority of time at airports outside the state. The OAP projected that statewide based aircraft would grow an estimated 1.23% yearly to 6,225 by 2030. For the same timeframe, GA operations are projected to grow from 1.62 million (2005) to 2.22 million total operations—an estimated 1.58% yearly, which is slightly above the based aircraft growth rate.

In 2005, the Scappoose Industrial Airpark accounted for an estimated 3.1% of total based aircraft and 3.8% of total GA operations in the Oregon state airport system.

The FAA Terminal Area Forecast (TAF)—for airports in the federal airport system, like Scappoose—is projecting an increase in based aircraft in the state at an average annual growth rate of 1.09%, less aggressive than the 1.23% growth rates that OAP 2007 projected. However, the OAP 2007 study was conducted before the economic recession and the FAA projections were published this year. Oregon's total GA operations declined from 2008 to 2011, but the FAA is projecting growth over the next two decades at 1.31% annually—also more conservative than the 1.58% growth projected in the OAP 2007.

The Scappoose Industrial Airpark is without an Air Traffic Control Tower (ATCT) so daily airport operations are not tracked. Consequently, annual airport operations and the type of operations are estimated. When available, fuel sales records can provide one measure in aviation activity. The POSH should obtain aviation gasoline (100LL) and jet fuel (Jet A) sales records from the FBO on a routine basis to monitor changes in activity.

For this master planning study, airport operations estimates for Scappoose are derived from the FAA TAF, which reported 75,500 operations for 2011, and the FAA Airport Master Record reports the same estimate for 2012. However, pre-recession airport operations were reported as nearly 64,000 in 2007, and then increased over the last five years. This is contrary to the nationwide decrease in GA activity. While it is uncertain how accurate the 64,000 figure from 2007 is, the FAA TAF report of strong growth in airport operations at Scappoose over the last five years is considered inaccurate. Based aircraft reported in the FAA TAF over the last five years are also considered inaccurate as the count dropped from 158 to 45 in five years while the POSH reports that their average occupancy rates have remained around 95 percent for the same period. **As reported in Chapter 1, Inventory, the based aircraft count for Scappoose is estimated at 130, down from 2007 levels, but substantially higher than FAA TAF reports for the last couple of years.**

SOCIOECONOMIC TRENDS

An understanding of the economy around Scappoose Industrial Airpark is useful for forecasting aviation demand since air transportation use and aircraft ownership are often sensitive to changes in area population and economy. Higher income often relates to higher levels of aircraft ownership, pilots per capita, and aircraft use. Further, higher income may translate to increased

use of air transportation for business and more discretionary income for personal aviation use. Likewise, demand for aviation is sensitive to unemployment trends, which saw a significant increase and subsequent slow recovery in recent years. Finally, economic development plans in the community and region may generate increased demand for air transportation.

Table 3B shows that over the last 20 years, the populations of Oregon and Columbia County have risen. While Oregon's total population growth outpaced Columbia County from 1990-2000, the most recent decade shows Columbia County's growth rate above the statewide growth.

Table 3B. Historical State and County Population

	Oregon	Columbia County
1990	2,842,337	37,557
2000	3,421,399	43,560
2010	3,831,073	49,351
	Average Annual Growth Rates	
1990-2000	1.87%	1.49%
2000-2010	1.14%	1.26%
1990-2010	1.50%	1.37%

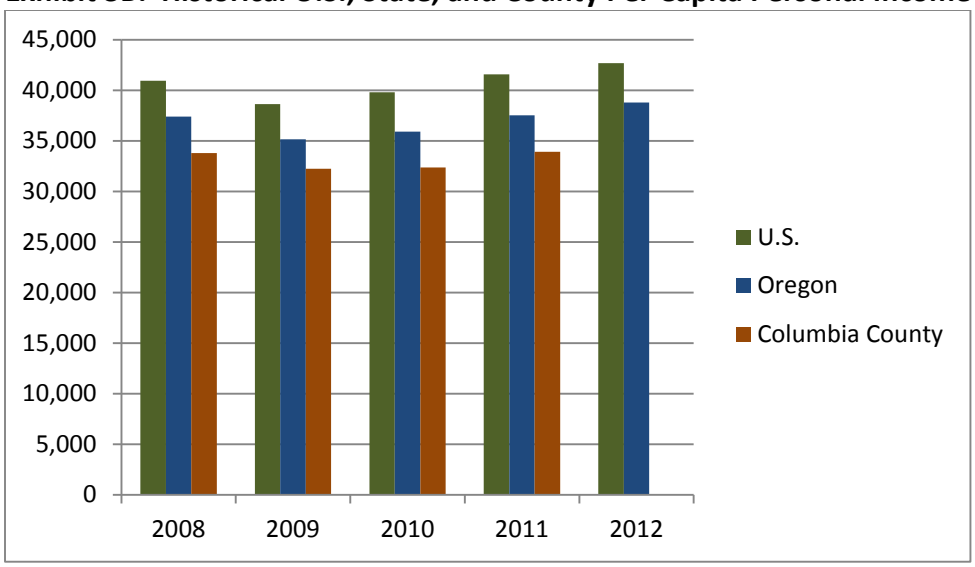
Source: U.S. Census Bureau

Since the 2010 Census, population estimates indicate a slower growth. Columbia County's average annual growth rate was 0.1% from 2010 to 2012 – a net increase of 250 residents.[2] Much of the county's population growth was concentrated in the City of Scappoose due to the area's proximity to the Portland job market. The City of Scappoose had a population of 6,685 residents in 2012, with an average annual growth rate of 0.1% (similar to the county rate).[3]

Historical income trends for the nation, state and county are presented in **Exhibit 3B.** As illustrated, the national per capita personal income (PCPI) level in recent history has exceeded the PCPI level for the state and county.

[2] Knoder, Erik A. Region 1 Population – Cities and Counties. Oregon Labor Market Information System (OLMIS), January 29, 2013
[3] Ibid.

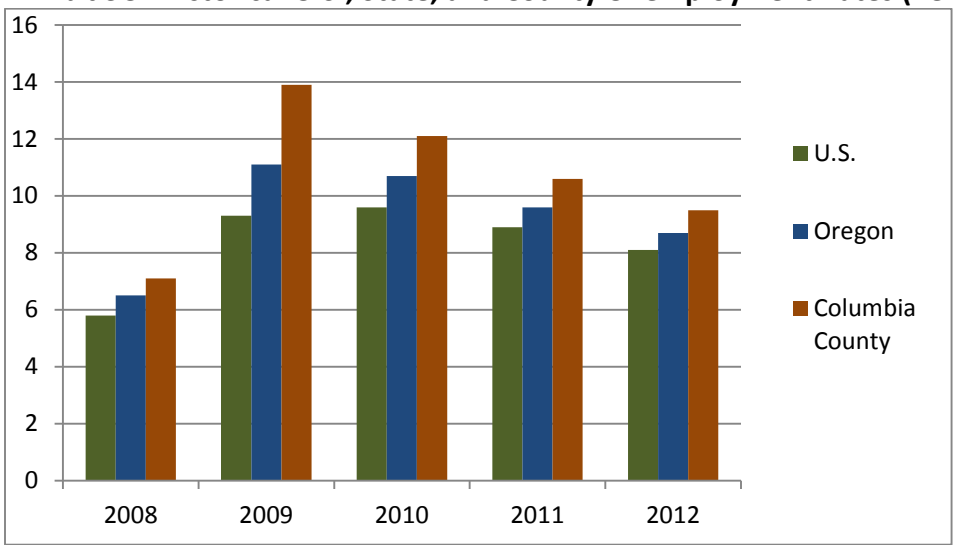
Exhibit 3B. Historical U.S., State, and County Per Capita Personal Income



Source: U.S. Department of Commerce, Bureau of Economic Analysis 2013
Note: 2012 County Per Capita Personal Income figure not available for 2012

Unemployment rates are a general indicator of economic stability. Columbia County's unemployment rates typically run higher than state and national rates, yet follow a similar pattern. The recent economic recession greatly impacted employment opportunities for Columbia County residents. As shown in **Exhibit 3C**, the countywide unemployment rate skyrocketed from 7% in 2008 to nearly 14% in 2009. However, unemployment rates have steadily declined since peaking in 2009.

Exhibit 3C. Historical U.S., State, and County Unemployment Rates (Percentage)



Source: U.S. Bureau of Labor Statistics 2013

As of May 2013, the unemployment rate for Columbia County was 8.3%.[4] The decline of unemployment rates over the past four years suggests that the regional economy is slowly recovering from the effects of the recession.

While reviewing historical socioeconomic trends provides a measure of the region's economic health in the past, future projections are reviewed to assess support for future aviation growth.

Table 3C depicts population projections for the state and county published by the Oregon Office of Economic Analysis in 2013.

Table 3C. Population Projections for State and County

	Oregon	Columbia County
2010	3,837,300	49,430
2020	4,252,100	54,517
2030	4,768,000	61,273
	Average Annual Growth Rates	
2010-2030	1.09%	1.08%

Source: Oregon Office of Economic Analysis - County Population Projections (2013)
Note: Population figures for 2010 vary slightly from US Census Bureau 2010 data.
Local sources of population projections are available and forecast higher annual growth (2%).

As shown above, the state and county population is projected to increase at an average annual rate of 1.09% and 1.08%, respectively. This projected growth is slower than the historical population growth for the state and county over the last 10 to 20 years, as depicted earlier in Table 3B.

Employment growth projections by industry, published in the Scappoose Economic Opportunities Analysis (2011), suggest employment growth potential in Scappoose could be substantial.[5] The report forecasts an average annual growth rate (AAGR) of 7.6% for the City of Scappoose, with 8,068 additional jobs by 2030. Industries with the highest level of projected growth include Professional and Business Services (12.8% AAGR) and Manufacturing (11.7% AAGR).

Scappoose's proximity to the Portland job market has made it a popular bedroom community for commuting workers. [6] Approximately three-quarters of Scappoose residents commute to jobs located outside of Columbia County. Most Scappoose residents commute to jobs in the Portland metropolitan area. While there are significantly fewer jobs than workers in the City of Scappoose, the city still has its share of non-resident workers. Approximately 35% of Scappoose jobs are filled

[4] Oregon Labor Market Information System (OLMIS) – Current Unemployment Rates.
[5] City of Scappoose, Economic Opportunities Analysis, January 10, 2011
[6] City of Scappoose, Economic Opportunities Analysis, January 10, 2011

by workers living outside of Columbia County. This indicates a willingness among residents of neighboring counties to commute to Scappoose for work purposes. If the Scappoose Industrial Airpark proceeds with future development plans, it is likely that a sizeable portion of the resulting jobs may be filled by residents from Multnomah County, Washington County, and other areas. These trends could support the continued growth of aviation in the region.

The City of Scappoose's location is well-positioned for "spillover" growth from Portland. The shortage of industrial land in Portland's metro region is increasingly motivating firms to seek land in neighboring communities where there are more options and fewer restrictions. Scappoose is an attractive option for firms seeking large industrial sites within close proximity to the Portland metro area. Scappoose can provide developers with large, reasonably-priced industrial parcels located within close vicinity to a regional airport.

The Port of St. Helens has maintained a strong vision for the long-term growth and development of the Airport. However, the Airport's long-term development potential could be enhanced by extending the Urban Growth Boundary (UGB) to the area. In 2011, the Scappoose City Council and Columbia County Board of Commissioners voted to expand the city's UGB by 378 acres near the airport to accommodate future industrial and commercial growth. The UGB expansion was approved by Scappoose voters in 2011, and the Oregon Department of Land Conservation and Development in 2012; however, the proposed expansion is currently under appeal. It is uncertain when (or if) the expansion will be ultimately implemented.

The uncertainties associated with the UGB expansion have prevented the POSH and adjacent landowners (such as Airpark Development LLC) from moving forward with plans to develop the area into a mixed-use aviation park. A Scappoose Airport Business Plan was prepared for Airpark Development LLC in August 2012, illustrating a development scenario for land surrounding the airport. The plan will need to be updated once the UGB issue is resolved.

If the UGB expansion were ultimately instituted, the land base around the Airport would be greatly expanded, positioning the area for new growth. Research indicates that expansion of Scappoose's UGB would greatly benefit the City's future economic growth potential. The City of Scappoose Economic Opportunities Analysis (EOA) report provided a breakdown of proposed land uses for the additional acreage to generate a significant increase in jobs over the next 20 years. The proposed distribution included 115 acres for commercial development, 144 acres for airport use, 215 acres for industrial development, and 20 acres for institutional use.[7] The Port presently owns undeveloped land east of West Lane Road and west of Skyway Drive, which could be developed as shown on the existing ALP prepared for the previous master plan.

A number of developers have expressed interest in constructing and operating facilities near the Airport. Approximately 1,000 acres near the Airport were recently added to the South Columbia County Enterprise Zone – a designation that promotes local development through tax incentives.

[7] The Chronicle Online, Scappoose poised for economic growth spurt, January 10, 2011

This will likely attract additional commercial developers to the Airpark and the surrounding area. In 2009, Portland Community College (PCC) signed a letter of intent with Airpark Development LLC to develop land in the Scappoose Industrial Airpark, including a 20-acre parcel within the current UGB, and 282 acres east of the UGB. PCC is interested in developing the site as a Columbia County educational facility; however, these plans cannot be finalized until the UGB expansion issue is resolved. Consequently, PCC recently announced that they were considering other potential sites for their proposed project.[8]

BASED AIRCRAFT FORECAST

The FAA Terminal Area Forecast (TAF) maintains records of the numbers and types of aircraft based at the Airport (**Table 3D**), but the substantial drop in figures for 2008 to 2011 may signify errors. The reported 45 based aircraft in 2011 was also reported on the FAA Airport Master Record (Form 5010) for 2012. However, as of late June 2013, the Airport Master Record was updated and presently identifies the based aircraft at Scappoose to total 117. As noted in Chapter 1 (Inventory), discussions with the POSH regarding present hangar and tiedown leases suggest that the based aircraft count is currently at 130. Consequently, this figure is used for the forecasting effort. Although the accuracy of numbers of based aircraft has improved since the FAA sponsored a nationwide inventory in 2007, some based aircraft data entered could be in error. The FAA defines a based aircraft as one that is active—flown at least one hour per year.

Using 130 as the existing based aircraft count, various forecasting models are applied. Due to the inconsistency and uncertain accuracy of the historical based information, regression analyses and trend line forecasting models were not used. **Exhibit 3D** graphically illustrates the recent historical numbers of based aircraft, along with the forecast based aircraft from 2013 to 2032. **The preferred forecast is the population growth model—descriptions of the forecasting models follow Exhibit 3D.**

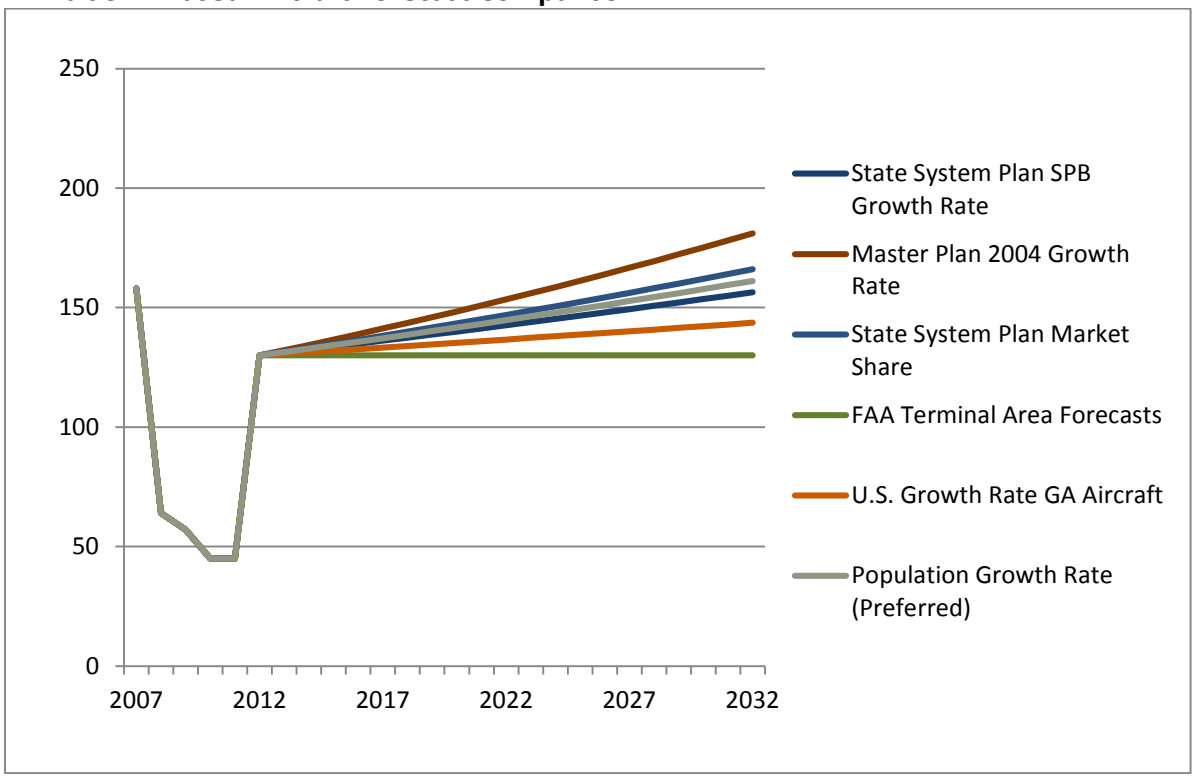
[8] *Portland Tribune, PCC seeks alternatives for Columbia County facility, May 24, 2013*

Table 3D. Historical Based Aircraft at Scappoose Industrial Airpark

Year	Single Engine	Multi-Engine	Jet	Helicopter	Other	Total
2000	63	4	0	6	2	75
2001	124	5	1	1	20	151
2002	122	5	1	0	12	140
2003	123	5	1	0	12	141
2004	124	5	1	1	20	151
2005	124	5	1	1	20	151
2006	140	5	0	1	12	158
2007	140	5	0	1	12	158
2008	49	2	0	1	12	64
2009	43	1	0	1	12	57
2010	43	1	0	1	0	45
2011	43	1	0	1	0	45
2012	114	2	0	2	12	130

Source: FAA TAF for 2000-2011 figures; estimated 2012 figures derived in coordination with Columbia County.
Note: Figures reveal substantial fluctuations and accuracy cannot be confirmed.

Exhibit 3D. Based Aircraft Forecast Comparison



STATE SYSTEM SCAPPOOSE (SPB) GROWTH RATE

The latest airport system plan, OAP 2007, projected based aircraft to grow at an average annual rate of 0.93% for Scappoose. In the OAP 2007, this resulted in 182 total based aircraft by 2025, but it was based on a current based aircraft count of 151 (2005 data). For this master plan forecast model, the baseline figure for based aircraft is adjusted to 130 with the 0.93% rate applied, resulting in a total of 156 based aircraft in 20 years.

MASTER PLAN 2004

In the Scappoose Industrial Airpark Master Plan published in 2004, the preferred forecast for based aircraft used an average annual growth rate of 1.67%. While the existing based aircraft count used for the forecast at the time was 140, the Airport's current 130 aircraft count is used for this model. As a result, the based aircraft count by 2032, is projected to reach 181 or an increase of 51 aircraft—the highest increase of the models presented above. It is recognized that the 2004 Plan's baseline figures are 10 years old, and well before the numerous economic and aviation industry changes that have occurred in recent years.

STATE SYSTEM PLAN MARKET SHARE

The latest airport system plan projected statewide based aircraft to grow at an average annual rate of 1.49%. This model assumes that the Scappoose Industrial Airpark will maintain its current share of the state based aircraft count over the 20-year planning period so the 1.49% growth rate is applied producing a forecast of 177 based aircraft for the 20-year planning period.

TERMINAL AREA FORECAST (TAF)

The FAA's most recent forecast for the Scappoose Industrial Airpark, published in March 2013 used the 2011 based aircraft figure of 45 as the baseline and projected no growth for the Airport over the next 20 years. Adjusted to the current 130 based aircraft, the forecast for this TAF model indicates the Airport will remain at 130 based aircraft by 2032.

U.S. GROWTH RATE FOR GA AIRCRAFT

This forecast model assumed that the number of based aircraft at the Airport would grow at 0.5% per year, which is the growth rate the FAA forecast for GA aircraft, nationwide, in March 2013. While much lower than the 2004 Master Plan and State System Plan forecast, this model projects that an additional 14 aircraft will be based at the Airport by 2032, for a total of 144 aircraft.

POPULATION GROWTH RATE (PREFERRED)

The preferred forecast follows the Columbia County population growth rate of 1.08%, which is below the Oregon state airport system anticipated growth rate of 1.49% and the previous master plan projected growth rate of 1.67%, but both of these planning documents were prepared prior to the economic recession. Considering the FAA and aviation industry projections published more recently are more conservative than projections a couple of years ago, a growth rate around one percent is well-aligned with trends and industry expectations. This preferred forecast model results in a based aircraft total of 161 by 2032, which is an increase of 31 aircraft over 2012. In comparison, the 161 based aircraft forecast for the 20-year planning window is just above the estimated based aircraft count of 158 reported in 2007 before the economic recession. Consequently, this forecast model projects that recovery to the highest historical based aircraft figures will be gradual over the 20-year planning period.

Table 3E lists the fleet mix projected for the based aircraft in the next 5-, 10-, and 20-year timeframes.

Table 3E. Based Aircraft and Fleet Mix Forecast for Scappoose Industrial Airpark

Year	Single Engine	Multi-engine	Jet	Helicopter	Other	Total
2012	114	2	0	2	12	130
2017	118	3	1	3	12	137
2022	124	3	2	3	13	145
2032	134	4	4	5	15	161
			Fleet Mix			
2012	88%	2%	0%	2%	9%	100.00%
2017	86%	2%	1%	2%	9%	100.00%
2022	85%	2%	1%	2%	9%	100.00%
2032	83%	3%	3%	3%	9%	100.00%

This based aircraft forecast was submitted to the FAA for review and approval. In a letter dated February 18, 2014, the FAA approved the forecasts. A copy of the approval letter is included in Appendix D.

AIRCRAFT OPERATIONS FORECAST

Table 3F shows the history of aircraft operations from the FAA TAF for Scappoose Industrial Airpark from 2000 to 2011. Operations for 2012 represent an adjusted figure. Without an ATCT, operations are estimated. Further, fuel flowage data was unavailable so operational estimates, changes, and peaking activity over the last few years cannot be assessed by fuel sales. Since input from interviews and airport user surveys concluded that operations did decline during the

economic recession, the historical operations data from the FAA TAF is also in question. While 75,500 annual operations has been reported in the FAA TAF over the last couple of years, and in the latest FAA Airport Master Record update, this figure is well above the pre-recession activity levels reported in the FAA TAF. However, the 75,500 operations figure appears to align with pre-recession forecasts for the Airport, but could potentially be connected to the acoustical count performed in 2002 for Scappoose, which also concluded with an estimated 75,000 annual operations and documented in the previous master plan. However, this figure was never incorporated into the FAA TAF figures for 2002 or soon after.

For the airport master plan forecasting effort, total operations have been adjusted to better align with airport user feedback and the regional/national drop in GA operations resulting from the recession**. The adjusted operations figure to be used as the 2012 baseline for the master plan is 60,000 operations.**

Table 3F. Historical Aircraft Operations at Scappoose Industrial Airpark

	Itinerant Operations					Local Operations			
Year	Air Carrier	Air Taxi & Commuter	GA	Military	**Itinerant Total**	GA	Military	**Local Total**	**TOTAL Operations**
2000	0	2,500	30,505	1,500	34,505	18,904	0	18,904	53,409
2001	0	2,500	31,201	1,500	35,201	18,979	0	18,979	54,180
2002	0	2,500	32,637	1,500	36,637	19,454	0	19,454	56,091
2003	0	2,500	34,073	1,500	38,073	19,929	0	19,929	58,002
2004	0	2,500	35,474	1,500	39,474	20,397	0	20,397	59,871
2005	0	2,500	36,909	1,500	40,909	20,872	0	20,872	61,781
2006	0	2,410	36,366	1,419	40,195	21,985	0	21,985	62,180
2007	0	2,415	37,389	1,343	41,147	22,489	0	22,489	63,636
2008	0	2,329	36,839	1,270	40,438	23,690	0	23,690	64,128
2009	0	2,334	37,820	1,201	41,355	24,208	0	24,208	65,563
2010	0	5,000	40,000	500	45,500	30,000	0	30,000	75,500
2011	0	5,000	40,000	500	45,500	30,000	0	30,000	75,500
2012	0	2,500	33,500	600	36,600	23,400	0	23,400	60,000

Source: FAA TAF used for 1990-2011 figures; the 2012 figures are adjusted down from 2011 based on airport user interviews/survey responses and regional/ national drop in GA operations to below pre-recession levels.

The preferred forecast for operations examined each component of traffic individually, as explained in the following paragraphs.

AIR TAXI AIRCRAFT OPERATIONS

The air taxi category refers primarily to passenger/cargo charter or air taxi, fractional jet operations, and air ambulance. IFR records show that companies that used the Scappoose

Industrial Airpark in 2012 for air taxi service operations included several companies, some unnamed, but others were identified; examples include AIRPAC, Ameriflight, and Angel Flight. AIRPAC Airlines is a contract cargo operator based out of Seattle's Boeing Field that typically flies a Piper Seneca in the Scappoose Industrial Airpark; AIRPAC states that their customers typically include banks, health labs and courier companies. Ameriflight is also a cargo courier, with several locations in the U.S. including Portland International Airport and SeatTac International Airport. Angel Flight is an organization that matches patients in need of medical transport who cannot afford it with pilots and companies willing to provide transport as a charitable service. Some of the other air taxi operators that have used Scappoose in the past include companies such as LJ Aviation and Flight Options providing fractional jet ownership and/or jet time cards, which is a type of an advanced-pay air taxi time card without a contract commitment.

Air taxi flights are usually IFR. However, some air taxi flights are not counted as pilots sometimes file their IFR flight plans after takeoff or cancel them before landing.

The FAA Terminal Area Forecast for Scappoose Industrial Airpark projects 0.21% growth in air taxi operations through 2032. In contrast, the TAF projects air taxi operations for the state of Oregon to grow at an average annual rate of 1.06%. Further, the FAA's national forecast projects GA and Air Taxi hours flown to increase at an average of 1.5% annually. The preferred forecast for air taxi operations assumes that Scappoose will maintain its market share in Oregon; therefore, the 1.06% annual growth rate for air taxi operations is selected. By 2032, air taxi operations are projected to reach 3,099—up from an estimated 2,500 in 2012. This results in moderate growth that remains below historical peak activity in estimated air taxi operations.

GA AIRCRAFT OPERATIONS

The annual GA operations forecast is derived for both local and itinerant operations using an operations per based aircraft (OPBA) ratio. The current OPBA ratio is determined by using the current number of based aircraft (130) and estimated annual GA local and itinerant operations (56,900). This equates to a current OPBA of 438. Then, for each year in the forecast, operations equal the forecast number of based aircraft multiplied by an established OPBA ratio. This common practice recognizes that some of the operations in an OPBA ratio are by based aircraft and some are by transient/visiting aircraft. The FAA has provided the following guidelines for OPBA ratios:[9]

- 250 OPBA is typical at a rural GA airport with little itinerant traffic
- 350 OPBA is typical at a busier GA airport with more itinerant traffic
- 450 OPBA is typical at a busy reliever airport with a large amount of itinerant traffic.

[9] FAA Order 5090.3C, *Field Formulation of the National Plan of Integrated Airport Systems (NPIAS).*

The Airport's current OPBA of 438 falls within a typical range for a busy GA airport. Based on the current airport characteristics, aviation industry trends, the economic development in the area, and the growing itinerant activity in the Portland-metro area that spills over to area airports, the OPBA is projected to gradually increase to 450 by 2032. Accordingly, GA operations will increase to 72,450 operations, a 1.22% average annual growth rate, for the 20-year planning period. In contrast, the FAA TAF projects a 2.05% and 1.76% average growth rate for itinerant and local GA operations, respectively.

As discussed earlier, *FAA Aerospace Forecasts Fiscal Years 2013-2033* projects GA hours flown to grow 1.5% annually, but the drop in piston aircraft and strong increase in jet activity is part of the mix to be considered for individual airport forecasts. While the Oregon Aviation Plan projected a stronger growth in operations, this projection occurred prior to the economic recession and the resulting impacts to GA. While population growth has not shown a correlation with GA activity in recent past since numerous factors affecting aviation do not affect population, forecast population is still an important consideration to validate aviation growth. With Oregon population projections of 1.09% annually and Columbia County projections at 1.08%, this offers another supporting factor for the anticipated recovery in GA activity.

In 2012, GA itinerant operations represent an estimated 59% of total airport operations. The preferred forecast assumes the itinerant GA portion will remain the same--transient activity such as the corporate GA segment is expected to grow proportionately with local operations such as training activity, particularly as other area airports become busier and training operations shift to less congested airports.

MILITARY AIRCRAFT OPERATIONS

For 2012, military operations are estimated at 600, or 1% of total airport operations. Future military aircraft operations are difficult to predict, and the FAA typically projects no growth or decline in military aircraft operations in its annual Terminal Area Forecasts and national aerospace forecast. For Scappoose, the FAA TAF projects zero growth through the planning period. The preferred forecast for military operations uses the FAA TAF's zero-growth forecast, but is based on the 2012 estimate of military operations totaling 600 operations.

PREFERRED FORECAST FOR TOTAL OPERATIONS

The preferred forecast for aircraft operations, shown in **Table 3G**, sums up the individual component forecasts. This forecast was submitted to the FAA for review and approval. In a letter dated February 18, 2014, the FAA approved the forecasts. A copy of the approval letter is included in Appendix D.

Table 3G. Aircraft Operations Forecast for Scappoose Industrial Airpark

	Itinerant Operations				Local Operations		
Year	Air Taxi	GA	Military	Total Itinerant	GA	Total Local	Total Operations
2012	2,500	33,500	600	36,600	23,400	23,400	60,000
2017	2,638	35,625	600	38,863	24,756	24,756	63,619
2022	2,784	37,967	600	41,351	26,384	26,384	67,735
2032	3,099	42,746	600	46,445	29,705	29,705	76,149

PEAK AIRCRAFT OPERATIONS FORECAST

Airport operations routinely fluctuate between and high and low activity levels. Identifying the peak levels is important to the subsequent identification of facility requirements as airside and landside facilities should be designed to accommodate peak levels of use. Peak demand is usually expressed as "Peak Month" (the month in a calendar year when the highest level of activity occurs), "Design Day" (the average daily level of activity during the Peak Month), and "Design Hour" (the busiest hour within the Design Day).

From limited IFR operations data and airport user input, it appears the peak month for operations is July and contains about 11% of the annual total. The peak day is calculated by dividing the peak month by 31 days. The design hour is estimated to be 15% of the peak day.

The peak operations forecast appears in **Table 3H**.

Table 3H. Peak Operations Forecast for Scappoose Industrial Airpark

	2012	2017	2022	2032
Annual Operations	60,000	63,619	67,735	76,149
Peak Month (11% of Annual)	6,600	6,998	7,451	8,376
Design Day	213	226	240	270
Design Hour (15% of Peak Day)	32	34	36	41

CRITICAL AIRCRAFT AND AIRPORT REFERENCE CODE

According to FAA criteria, an airport's design is based on the characteristics of the critical aircraft, which is the most demanding aircraft that uses the airport "regularly" or "substantially." The FAA defines regular or substantial use as at least 500 annual itinerant operations. The Airport Reference Code (ARC) is the main criterion for determining applicable FAA airport design standards for dimensions such as runway and shoulder widths; separations of runways, taxiways, and taxilanes; and cleared areas. However, new FAA guidance provides guidance for runway design codes and taxiway design groups, for example, by providing standards to serve different design aircraft on different runways and taxiways.

The ARC is defined by the Aircraft Approach Category and the Airplane Design Group of the critical aircraft. The Aircraft Approach Category is determined by the approach speed, or 1.3 times the stall speed of the aircraft in its landing configuration at its maximum landing weight. The letters A, B, C, D, and E represent the Aircraft Approach Category. The Airplane Design Group of the aircraft is based on the wingspan or tail height, and is defined by Roman numerals I, II, III, IV, V and VI. **Table 3I** shows the ARC component definitions and typical aircraft that meet these definitions.

Table 3I. Airport Reference Code (ARC) Components

Approach Category	**Approach Speed**	**Typical Aircraft**
A	Less than 91 knots	Cessna 150, 172, 206, Beech Bonanza
B	91 to 120 knots	King Air, Piper Navajo, Gulfstream I
C	121 to 140 knots	Boeing 727, 737, Learjet, Challenger
D	141 to 165 knots	Boeing 747, Gulfstream V
Airplane Design Group	**Wingspan**	**Typical Aircraft**
I	Less than 49 feet	King Air, Cessna 150, 172, 206, Gates Learjet, Beech Bonanza
II	49 to 78 feet	King Air, Super King Air, Cessna Citation, Dassault Falcon, Gulfstream I, Challenger
III	79 to 117 feet	Boeing 727, 737, DC-3, DC-6, Gulfstream V

Airplane Design Group may be determined by tail height, if more demanding than wingspan:

Airplane Design Group	**Tail Height**
I	Less than 20 feet
II	20 to 29 feet
III	30 to 44 feet

Source: FAA AC 150/5300-13A, Airport Design. Notes: 1) The above ARC information represents the Airport's highest runway design code, which is defined by the above as well as visibility minimums. 2) Aircraft Approach Category E (166 knots or more) and Airplane Design Groups IV, V, and VI (118 feet or more) are not shown.

According to airport user interviews and survey respondents, the most demanding aircraft types operating at the Airport on a "regular" basis fall within Approach Category B and Airplane Design

Group II. Consequently, the **Airport Reference Code for the Scappoose Industrial Airpark is presently B-II,** which is the same ARC identified in the previous master plan. Further, **B-II is the forecast ARC for the 20-year planning period** according to the anticipated changes in the operations fleet mix forecast, which follows aviation industry trends. **The critical aircraft identified for Scappoose Industrial Airpark in the B-II family is the King Air.** However, there are several other aircraft operating at the Airport in the Approach Category B and/or Airplane Design Group II. **Small B-I and B-II business jets, such as the Cessna Citation 560,** also operate at Scappoose, but based on the recent decline in GA activity levels, **these aircraft are not conducting more than 500 annual itinerant operations, but are expected to exceed this threshold in the near-term (2017).**

While occasional operations by Approach Category C operations are anticipated, they are well below the 500 annual itinerant operations threshold and do not support an upgrade in the ARC from B-II. However, the OAP 2007 recommends an ARC of C-II be supported at airports designated as Urban GA Airports, like Scappoose. This is considered in the chapters on facility requirements and development alternatives.

Chapter Four REQUIREMENTS

Scappoose Industrial Airpark Master Plan Update

Chapter 3, Forecasts, provided a forecast of the aviation demand levels that are expected at Scappoose Industrial Airpark throughout the 20-year planning period. This chapter, Facilities Requirements, will examine the capacity of the existing airport facilities and their adequacy in accommodating the forecast demand. The chapter will identify the need for new facilities and/or existing facilities improvements as well as the activity level at which these facilities and improvements become needed.

Three planning activity levels were identified, they are: near-, mid- and long-term. The planning activity levels roughly correspond to 5-year, 10-year and 20-year periods in the forecast. It is important that actual improvements are based on the activity level rather than specific time intervals, since actual airport activity may fall below or accelerate above the forecasts and all development should be demand-driven.

Table 4A illustrates the forecast level of activity associated with the various planning levels.

Table 4A. Planning Activity Levels

Planning Activity Level	Near-Term	Mid-Term	Long-Term
Year	2017	2022	2032
Based Aircraft	137	145	161
Number of operations	63,619	67,735	76,149
ARC	B-II	B-II	B-II

Source: Chapter 3, Forecasts

The requirements identified in this chapter will provide the framework for identifying possible long-term development concepts for the Airport in the next chapter. For comprehensive planning purposes, the needs discussed in this chapter are not limited to those facilities and services that might be funded or provided by the Port of St. Helens (POSH), County, City, State or FAA, but also anticipate facilities and services that private entities might provide.

PLANNING CRITERIA

The development and use of planning criteria ensures that recommended improvements and proposed development align with the goals and objectives of the national, state, regional and local air transportation systems, appropriate aviation industry segments, and the airport sponsor's vision. The sources from which the planning criteria are drawn include:

- Federal Aviation Administration (FAA) – FAA design guidelines found in Advisory Circular (AC) 150/5300-13A Airport Design provide the planning criteria, with respect to the current as well as future critical or design aircraft, for the runway, taxiways and apron areas.

- Transportation Security Administration (TSA) – Although the TSA does not regulate general aviation airports like Scappoose, it does provide guidance for security at general aviation airports. The guidelines provided by the TSA are tailored to an airport's size and risk level.

- Oregon Aviation Plan - Provides a distribution of airports by classification as well as recommendations and direction on how to meet the state's long term commercial and general aviation needs. The Plan also provides a set of performance objectives based on the airport's classification.

- Business Aviation Industry – The National Business Aviation Association (NBAA) represents the industry and provides recommendations for airports' facilities and services to accommodate business aviation needs.

- POSH, Columbia County, City of Scappoose and Airport Users – Planning Advisory Committee members, other meeting participants and survey respondents provided input specific to Scappoose Industrial Airpark. The local airport community is an important source since its operational issues, community relationships, and future vision for the airport help shape the list of future facility needs.

AIRPORT ROLE

The airport's role in the National, State and Regional systems was discussed in Chapter 1, Introduction. This section provides a brief review of the airport's role in the various systems. The identification of the airport's role is the basis in defining its current and future needs.

The National Plan of Integrated Airport Systems (2013-2017) classifies Scappoose Industrial Airpark (SPB) as a general aviation facility. Further, FAA's General Aviation Airports: A National Asset, published in May 2012, divided the general aviation airports into four categories based on existing activity measures (2009 data) such as the number and types of based aircraft (i.e., aircraft that are stored at an airport), as well as the volume and types of flights. The four categories are national, regional, local, and basic. **The document classifies SPB as a local airport**. A local airport is defined as one that "supplements local communities by providing access primarily to intrastate and some interstate markets." Further, the document describes local airports as the backbone of the national general aviation system. They account for 42 percent of the general aviation airports eligible for Federal funding. They also account for approximately 38 percent of the total flying at the studied general aviation airports and 17 percent of flying with flight plans.

The Oregon System Plan (OAP 2007) designates Scappoose Industrial Airpark as an Urban General Aviation (GA) Airport. The OAP designates a role for each airport within the system, helping to distinguish between the various levels of service and activities associated with each airport across the state. OAP 2007 defined five different roles or classifications for the 97 airports considered in the statewide system. As noted in Chapter One, these five classifications are:

- Category I, Commercial Service – 8 airports
- **Category II, Urban GA – 10 airports**
- Category III, Regional GA – 13 airports
- Category IV, Local GA – 27 airports
- Category V, Remote Access/Emergency Service – 39 airports

The OAP recommends a set of minimum and desired facilities and services for Urban GA Airports. **Table 4B** outlines these facilities and services and compares them to Scappoose Industrial Airpark's existing facilities.

Table 4B. OAP Recommendations for Urban GA Airports

	Existing Facilities	Minimum Criteria	Desired Criteria
AIRSIDE FACILITIES			
FAA – ARC	B-II	C-II	Varies
NPIAS	Yes	Yes	Yes
Runway Length	5,100 feet	5,000 feet	Varies by Airport
Runway Width	100 feet	100 feet	Varies by Airport
Runway Pavement Type	Bituminous	Bituminous, Concrete	Bituminous, Concrete
Taxiways	Dual Full Parallel	Full Parallel	Full Parallel/High Speed Exit
Approach Type	Non-Precision	Precision	Precision
Visual Approach Aids	P4L, REIL (15/33)	One Runway End	Both Runway Ends
Instrument Approach Aids	LOC/DME (15) VOR/DME (33)	Not an Objective	One Runway End
Runway Lighting	MIRL	MIRL/HIRL	MIRL/HIRL
Taxiway Lighting	Reflectors	MITL/HITL	MITL/HITL
GENERAL FACILITIES			
Rotating Beacon	Yes	Yes	Yes
Lighted Wind Indicator	Yes	Yes	Yes
Weather Reporting	ASOS	AWOS/ASOS	AWOS/ASOS
Hangared Aircraft Storage	150	75% of Based Aircraft	100% of Based Aircraft
Apron Parking/Storage	50	75% of Daily Transient	100% of Daily Transient
Terminal Building	No	Yes	Yes
Auto Parking	Moderate	Moderate	Adequate
Fencing	Perimeter	Perimeter	Perimeter
Cargo	None	Designated Apron Area	Small Handling Facility w/ Apron
SERVICES			
Fuel	100 LL & Jet A	100 LL & Jet A	100 LL, Jet A, 24-hr service
FBO	Full Service	Full Service	Full Service, 24 hour
Ground Transportation	Offsite Rental Car, Taxi, Other	Offsite Rental Car, Taxi, Other	Rental Car, Taxi, Other
Food Service	Vending	Vending	Coffee Shop/Deli & Cold Foods
Restrooms	Yes	Yes	Yes
Pilot Lounge	Yes w/ weather reporting	Yes w/ weather reporting	Yes w/weather reporting

Source: Inventory, OAP 2007

The current Airport Reference Code (ARC) of B-II is forecast to remain the same through the 20-year planning period. OAP recommends a minimum ARC of C-II for Urban GA Airports. Airside requirements for B-II and C-II classifications will be reviewed throughout this chapter.

Other OAP 2007 recommendations for which SPB fails to meet the minimum criteria include a precision approach on at least one runway end, Medium Intensity Taxiway Lighting System (MITL) and a general aviation terminal building.

To assist airport communities with understanding and serving the needs of the corporate jets, the NBAA also publishes a set of facilities and services to consider. The publication, titled *NBAA Airports Handbook*, outlines both optimum and acceptable criteria. Examples of optimum criteria include a full taxiway system, approach lighting, high intensity runway lighting (HIRL), ASOS, full-service FBO, transient hangar space, major aircraft maintenance, and nearby restaurant and hotel/motel. The Scappoose Industrial Airpark meets more than half of these optimum standards, but is without HIRL, approach lighting, and a nearby restaurant and lodging. NBAA identifies medium intensity runway lighting and runway end identifier lighting as acceptable facilities, which the Airport provides. The NBAA also identifies a 24-hour Air Traffic Control Tower (ATCT) as optimum, but the NBAA considers airports without an ATCT as acceptable.

In addition to the published guidance and criteria for facilities and services, it is important to consider the local community's needs for the Airport. Scappoose can continue to be a convenient alternative to the more congested Portland International Airport for general aviation activity by accommodating demand as activity grows. As discussed in Chapter 2, Forecasts (Socioeconomic Trends section), Scappoose's location is well-positioned for "spillover" growth from Portland. The Airport's long-term development potential could be enhanced by extending the Urban Growth Boundary (UGB) to the area. The UGB expansion was adopted by the City and County in 2011, approved by the state of Oregon in 2012, and appealed to the Court of Appeals in 2013. The timeline for resolution of the appeal is unknown. The uncertainties associated with the UGB expansion have prevented the POSH and adjacent land owners (such as Airpark Development LLC) from moving forward with plans to develop the area into a mixed-use aviation park. A number of developers have expressed interest in constructing and operating facilities near the Airport. The August 2012 Scappoose Airport Business Plan that illustrates a development scenario for land surrounding the Airport will need to be updated once the UGB issue is resolved. If the UGB expansion is ultimately instituted, the land base around the Airport would be greatly expanded, positioning the area for new growth and potentially accelerating the need for facility improvements at the Airport.

The following sections address the facility needs of the Scappoose Industrial Airpark (Airport) for the 20-year planning period.

AIRSIDE REQUIREMENTS

AIRSIDE CAPACITY/DEMAND ANALYSIS

As indicated in Chapter 3, Forecasts, the Airport is expected to serve more than 76,000 operations annually by 2032. It is essential to analyze the current capacity of the airfield in order to determine its adequacy for accommodating the forecast demand.

The capacity analysis is based on FAA AC 150/5060-5, Airport Capacity and Delay. Additionally, ACRP Report 79 published by the Transportation Research Board (TRB) in 2012 provides a Prototype Airfield Capacity Spreadsheet Model that is "built on base calculations following the theory in the FAA *Airfield Capacity Model (ACM)* and applies variable separation, spacing and clearance standards following the guidelines included in FAA JO 7110.65, *Air Traffic Control*, and FAA EM-78-8A, *Parameters of Future ATC Systems Relating to Airport Capacity/Delay*." The spreadsheet model provided by the TRB was used to calculate the airfield capacity at Scappoose Industrial Airpark.

Two measures of airfield capacity commonly used in airport planning include:

- **Hourly capacity:** considers the throughput during a typical busy hour. Factors such as percentage of arrivals, runway crossings, and taxiway exit locations are considered to arrive at an hourly number of aircraft that can use the airfield without undue delays.

- **Annual Service Volume (ASV):** is an estimate of the number of aircraft operations that can be accommodated in one year. This measure is used to program additional runways, and/or modified taxiway exits.

Generally, airfield capacity improvements should be planned and programmed when an airport reaches 60% of its capacity. Construction of these improvements must begin before or upon the airport reaching 80% of its capacity.

In calculating the Airport's ASV, the projections of annual operations by the fleet mix specified in Chapter 3 were used. The analysis considered various factors including airfield layout, meteorological conditions, runway conditions, runway use, aircraft mix, percent arrivals, percent touch-and-go's, and exit taxiway locations. The demand characteristics that are relevant to calculating airfield capacity are the mix of aircraft types that utilize the airport in the design hour along with the percentage of arrivals and the percentage of touch-and-go operations as well as the percentage of IFR operations.

The Annual Service Volume for Scappoose Industrial Airpark was calculated at 230,000 operations. With a forecast of 76,000 operations, the Airport will only reach 33% of its capacity within the 20-year planning so capacity is more than sufficient to accommodate the demand projections.

AIRSIDE DESIGN STANDARDS

The Planning and development of airside facilities is based on complying with the FAA design standards listed in AC 150/5300-13A, *Airport Design*. This section summarizes the design standards contained in AC 150/5300-13A, and identifies conditions unique to SPB that influence design recommendations.

The FAA is responsible for the overall safety of civil aviation in the United States and all of the design standards in AC 150/5300-13A are primarily driven by safety. Other factors that influence the design standards included in the AC are efficiency and utility. The changes that affect the safety and efficiency of aviation are constantly evolving as the aviation industry continues its rapid development. AC 150/5300-13A, issued in September 2012, replaced and cancelled AC 150/5300-13, Airport Design, dated September 29, 1989 (including subsequent changes).

AC 150/5300-13A includes various clarifications and introduces new terms and concepts. This section will provide a brief summary of some of these new concepts and their application to Scappoose Industrial Airpark.

DESIGN AIRCRAFT

The design aircraft is the most demanding aircraft that currently operates or is forecast to operate at the airport on a “regular basis”, which the FAA defines as an aircraft with 500 or more itinerant annual operations. Characteristics of the design aircraft, such as approach speed, wingspan, tail height, main gear width, cockpit to main gear length, aircraft weight, and takeoff and landing distances influence the dimensions of airfield facilities.

Table 4C shows the various aircraft characteristics and the related design components that they influence.

Table 4C. Aircraft Characteristics and Design Components

Aircraft Characteristics	Design Components
Approach Speed	RSA, ROFA, RPZ, runway width, runway-to-taxiway separation, runway-to-fixed object.
Landing and Takeoff Distance	Runway Length
Cockpit to Main Gear Length (CMG)	Fillet design, apron area, parking layout
Outer to Outer Main Gear Width (MGW)	Taxiway width, fillet design
Wingspan/Tail Height	Taxiway and apron OFA, parking configuration, hangar locations, taxiway-to-taxiway separation, runway to taxiway separation

Source: FAA AC 150/5300-13A

It is important to note that the design aircraft may be a specific aircraft type, or a composite of aircraft characteristics. **The forecast chapter identified the King Air as the current critical aircraft** for Scappoose Industrial Airpark. However, growing activity by small business jets such as the Cessna 560 are projected to exceed the 500 operations threshold by 2017, but these aircraft are within the B-II classification like the King Air.

RUNWAY DESIGN CODE

In addition to the Airport Reference Code (ARC) mentioned in the forecast chapter, AC 150/5300-13A introduced the Runway Design Code (RDC) which is based on planned development and signifies the design standards to which the runway is to be built. The RDC is composed of three components, the Aircraft Approach Category (AAC), the Airplane Design Group (ADG) and the Visibility Minimums.

The first component, AAC, is depicted by a letter (A through E) and relates to the approach speed of the design aircraft. The second component, ADG, is depicted by a Roman numeral (I through VI) and relates to either the aircraft wingspan or tail height (physical characteristics); whichever is most restrictive. The third component relates to runway visibility minimums as expressed in Runway Visual Range (RVR) equipment measurements. RVR-derived values represent feet of forward visibility that have statute mile equivalents (e.g. 2400 RVR = ½-mile). The third component would read “VIS” for runways that are designed for visual approach use only.

Table 4D summarizes the Runway Design Code (RDC) classifications. Scappoose Industrial Airpark is B-II since the instrument approach visibility minimums are not less than one mile.

Table 4D. Runway Design Code Classifications

Aircraft Approach Category (AAC)	
AAC	**Approach Speed**
A	Approach Speed less than 91 knots
B	Approach speed 91 knots or more but less than 121 knots
C	Approach speed 121 knots or more but less than 141 knots
D	Approach speed 141 knots or more but less than 166 knots
E	Approach speed 166 knots or more

Airplane Design Group (ADG)		
Group #	**Tail Height (ft)**	**Wingspan (ft)**
I	< 20’	< 49’
II	20’ - < 30’	49’ - < 79’
III	30’ - < 45’	79’ - < 118’
IV	45’ - < 60’	118’ - < 171’
V	60’ - < 66’	171’ - < 214’
VI	66’ - < 80’	214’ - < 262’

Approach Visibility Minimums	
RVR (ft)	**Flight Visibility Category (statue mile)**
4000	Lower than 1 mile but not lower than ¾ mile (APV ¾ but< 1 mile)
2400	Lower than ¾ mile but not lower than ½ mile (CAT-I PA)
1600	Lower than ½ mile but not lower than ¼ mile (CAT-II PA)
1200	Lower than ¼ mile (CAT-III PA)

Source: FAA AC 150/5300-13A

TAXIWAY DESIGN GROUP

Under former guidance, taxiway design was based on Airplane Design Groups (ADG). In the updated Advisory Circular AC 150/5300-13A, taxiway design is based on newly established Taxiway Design Group (TDG), which is based on the overall Main Gear Width (MGW) and the Cockpit to Main Gear (CMG) distance. There are seven (1 through 7) TDG classifications. With respect to Scappoose Industrial Airpark, the design aircraft belongs to TDG 2. Aircraft with higher TDG group do use the airport and are expected to continue doing so throughout the planning period; however, operations by aircraft with a TDG higher than 2 are not expected to surpass the 500 operations threshold in the planning period.

OTHER DESIGN CONSIDERATIONS

Additional design criteria are determined based on aircraft weight and type of approach. A small aircraft is defined in Advisory Circular 150/5300-13A, *Airport Design*, as "an airplane of 12,500 pounds or less maximum certificated takeoff weight". An aircraft weighing more than 12,500 pounds is considered a large aircraft. Aircraft weight affects the required Part 77 surfaces and pavement design strength. Part 77 of the Federal Aviation Regulations defines "Objects Affecting Navigable Airspace" and establishes imaginary surfaces around airfields and approach/departure slopes to and from runways.

SCAPPOOSE INDUSTRIAL AIRPARK DESIGN STANDARDS

As discussed in Chapter 3, Forecasts, the critical aircraft identified for Scappoose Industrial Airpark is the King Air which belongs to the B-II family. Small B-I and B-II business jets such as the Cessna Citation 560 also operate at SPB and are expected to exceed the 500 operations threshold in the near future (2017).

Oregon Aviation Plan (OAP 2007) recommends that Urban GA Airports, like Scappoose Industrial Airpark, support C-II operations. Occasional operations by Aircraft Approach Category C aircraft and jets do take place at the airport but are not expected to surpass the threshold of 500 annual itinerant operations required to upgrade the Airport's design aircraft within the planning period. Throughout this chapter, requirements to accommodate aircraft in the C-II family are examined along with the requirements to accommodate B-II family aircraft.

Scappoose Industrial Airpark's instrument approaches include a published RNAV (GPS) Approach for Runway 15 with visibility minimums as low as one mile. Based on the above, the RDC at Scappoose Industrial Airpark is determined to be B-II and the TDG 2. The RDC and TDG are expected to remain unchanged throughout the planning period. The effect of providing instrument approaches with lower visibility minimums on the design standards are also discussed in this chapter.

Table 4E illustrates the existing airfield dimensions and separations at Scappoose Industrial Airpark as well as the design standards as provided in AC 150/5300-13A.

Table 4E. Existing Conditions and Design Standards

Airplane Design Group &Aircraft Approach Category		*B-II*		*C-II*	
Approach Visibility Minimums		*VIS & 4000*	*2400, 1600 & 1200*	*VIS & 4000*	*2400, 1600 & 1200*
Description	*Existing*				
RUNWAY					
Runway Width	100 ft	75 ft	100 ft	100 ft	100 ft
Runway Centerline to Holding Position		200ft	250 ft	250 ft	250 ft
Runway Centerline to Parallel Taxiway Centerline	225 – 240 ft	240 ft	300 ft	300 ft	400 ft
Runway Centerline to Aircraft Parking	>250 ft	250 ft	400 ft	400 ft	500 ft
Runway Safety Area Length Beyond Runway End	300 ft	300 ft	600 ft	1000 ft	1000 ft
Runway Safety Area Length Prior to threshold	300 ft	300 ft	600 ft	600 ft	600 ft
Runway Safety Area Width	150 ft	150 ft	300 ft	500 ft	500 ft
Runway Object Free Zone Length beyond Runway End	200 ft	200 ft	200 ft	200 ft	200 ft
Runway Object Free Zone Width	400 ft	400 ft	400 ft	400 ft	400 ft
TAXIWAY					
Taxiway Width	Varies, Minimum 35 ft	Based on TDG	Based on TDG	Based on TDG	Based on TDG
Taxiway Safety Area		79 feet	79 feet	79 feet	79 feet
Taxiway Object Free Area		131 ft	131 ft	131 ft	131 ft
Taxilane Object Free Area		115 ft	115 ft	115 ft	115 ft

Source: Inventory, FAA AC 150/5300-13A

RUNWAY REQUIREMENTS

NUMBER AND ORIENTATION OF RUNWAYS

The number of runways on a field is a function of the demand activity levels and/or wind coverage. Busy airports often provide parallel runways to increase their capacity and accommodate high activity levels while minimizing delays. As previously discussed, Scappoose Industrial Airpark's single runway provides sufficient capacity to accommodate the existing and forecast activity levels.

FAA Advisory Circular 150/5300-13A recommends a secondary/crosswind runway when the primary runway orientation fails to provide 95 percent wind coverage for specific crosswind components. The 95 percent wind coverage is computed on the basis of the crosswind component not exceeding 10.5 knots (12 mph) for A-I and B-I; 13 knots (15 mph) for A-II and B-II; 16 knots (18 mph) for C-I through D-II; and 20 knots for A-IV through D-VI.

Wind data specific to the airport was obtained from the National Oceanic and Atmospheric Administration (NOAA). Based on this all-weather wind analysis for Scappoose Industrial Airpark, utilizing the FAA Airport Design Software supplied with AC 150/5300-13A, the existing single runway configuration provides excellent wind coverage (i.e., in excess of 99.65%) for each of the crosswind components (10.5 knots, 13 knots and 16.5 knots). ***Therefore, no crosswind or wider primary runway is needed from a wind coverage standpoint.*** **Table 4F** illustrates the results of the wind analysis.

Table 4F. Wind Coverage Analysis

Crosswind Component (knots)	10.5	13	16
Wind Coverage (%)	99.65	99.85	99.99

Source: National Oceanic and Atmospheric Administration, National Climatic Data Center, Station 72683 Scappoose, Oregon. Period of Record: 2001-2009

RUNWAY LENGTH

The runway length requirements for Scappoose Industrial Airpark, and for all airports, are influenced by several factors that include the Airport's elevation, mean maximum daily temperature of the hottest month, runway gradient, critical aircraft and the stage length of the longest nonstop trip destination.

Runway length requirements are determined based on the guidance provided by AC 150/5325-4B, Runway Length Requirements for Airport Design, which specifies the use of the 5-Step procedure for determining runway length requirements for purposes of airport design.

It must be noted that, for small aircraft with a maximum takeoff weights (MTOW) of 12,500 pounds or less and larger aircraft with an MTOW of more than 12,500 pounds (up to and including 60,000 pounds), the use of the runway length curves specified by AC 150/5325-4B generates runway lengths equivalent to those generated using the FAA Airport Design Computer Program. The runway lengths produced by the FAA Airport Design Computer Program were verified for accuracy through the use of the runway length curves specified by AC 150/5325-4B.

The Airport's 58-foot elevation above mean sea level (MSL), its 82 degrees Fahrenheit (F) mean maximum temperature of the hottest month and its runway end elevation difference of 28 feet were among the variables entered into the FAA's Airport Design Computer Program as data input

to produce runway length requirements (data output). The results of the analysis are illustrated in **Table 4G.**

Table 4G. Runway Length Requirements

Airport elevation	58 feet
Mean daily maximum temperature of the hottest month	82 F.
Maximum difference in runway centerline elevation	28 feet
Length of haul for airplanes of more than 60,000 pounds	500 miles
Dry runways	
RUNWAY LENGTHS RECOMMENDED FOR AIRPORT DESIGN	
Small airplanes with approach speeds of less than 30 knots	300 feet
Small airplanes with approach speeds of less than 50 knots	800 feet
Small airplanes with less than 10 passenger seats	
75 percent of these small airplanes	2440 feet
95 percent of these small airplanes	3000 feet
100 percent of these small airplanes	3550 feet
Small airplanes with 10 or more passenger seats	4130 feet
Large airplanes of 60,000 pounds or less	
75 percent of these large airplanes at 60 percent useful load	4880 feet
75 percent of these large airplanes at 90 percent useful load	6430 feet
100 percent of these large airplanes at 60 percent useful load	5380 feet
100 percent of these large airplanes at 90 percent useful load	7890 feet
Airplanes of more than 60,000 pounds	Approximately 5030 feet

Source: FAA Airport Design Software (runway lengths shown are equivalent to runway length curves as specified in AC 150/5325-4B)

As illustrated in **Table 4G**, the current runway length of 5,100 feet is sufficient for all small airplanes (12,500 lbs. or less) including those with 10 or more passenger seats. The length is also sufficient for 75 percent of large airplanes (up to and including 60,000 pounds) at 60 percent of their useful load under dry conditions.

Given the majority of aircraft using and projected to use the runway fall within the small airplane category and that most large airplanes using the Airport are capable of using the runway (with the occasional required load reduction due to summer temperatures and/or longer runway length need), a runway extension is not justified within the 20-year planning period. However, long term development alternatives identified in the next chapter may consider runway lengthening should demand beyond the 20-year timeframe support the need for additional length.

For comparison, **Table 4H** presents runway length requirements for a sample listing of business jet aircraft and their runway length requirements adjusted for Scappoose conditions. The aircraft are listed in order of increasing runway length requirement. As shown in the table, nearly the first half of the business jets listed can be adequately served by the Airport's 5100-foot runway length, including the Cessna 560 Citation Excel, Learjet 45, and the Mitsubishi MU-300 Diamond, which is the last jet in the list that requires less than 5,100 feet.

RUNWAY WIDTH

The runway width requirement is a function of the newly created Runway Design Code (RDC), which, as previously explained, is a combination of the ADG, AAC and visibility minimums. For an ADG and AAC combination of B-II and visibility minimums as low as ¾ mile, the required runway width is 75 feet. For an AAC and ADG combination of B-II and visibility minimums lower than ¾ mile as well as for an AAC and ADG combination of C-II regardless of the visibility minimum, the required runway width is 100 feet.

Runway 15-33 is 100 feet wide which meets the requirements for the current and forecast RDC of B-II as well as the requirements for the OAP recommended RDC of C-II. This 100-foot width may be needed beyond the 20-year planning period if C-II activity surpasses the 500 annual itinerant operations threshold or if C-II activity accelerates beyond the master plan forecast. However, if consideration is given to reducing the runway width, then a benefit-cost analysis should be completed to assess the pavement cost savings versus the cost considerations for other associated needs such as lighting relocation and remarking.

Table 4H. Business Jet Runway Length Requirements at Scappoose (SPB)

Business Jets	AAC and ADG	Approach Speed (knots)	Wing Span (ft)	Max. Takeoff Wt (MTOW) (lbs)	Runway Length SPB
Cessna 551 Citation II/SP	*B-II*	*108*	*51.8*	*12,500*	*3,249*
Cessna 501 Citation I/SP	*B-I*	*112*	*46.8*	*10,600*	*3,451*
Cessna 500 Citation	*B-I*	*108*	*47.1*	*11,850*	*3,563*
Cessna 550 Citation II	*B-II*	*108*	*51.7*	*13,300*	*3,630*
Cessna 525 CitationJet (CJ-1)	*B-I*	*107*	*46.7*	*10,400*	*3,731*
Cessna 552/T-47A	*B-II*	*107*	*52.2*	*16,300*	*3,843*
Cessna 560 Citation V Ultra	*B-II*	*108*	*52.2*	*16,300*	*3,843*
Learjet 31	*C-I*	*124*	*43.1*	*16,500*	*4,101*
Cessna 525A CitationJet II (CJ-2)	*B-II*	*118*	*49.5*	*12,500*	*4,112*
Sabreliner 60	*C-I*	*134*	*44.6*	*20,200*	*4,202*
Cessna 560 Citation Encore	*B-II*	*108*	*52.2*	*16,830*	*4,269*
Cessna 560 Citation Excel	*B-II*	*107*	*55.7*	*20,000*	*4,303*
Cessna 550 Citation Bravo	*B-II*	*112*	*52.2*	*14,800*	*4,314*
Raytheon 390 Premier	*B-I*	*120*	*44*	*12,500*	*4,529*
Learjet 23	*C-I*	*124*	*NA*	*12,500*	*4,762*
BeechJet 400A/T/ T-1A Jayhawk	*C-I*	*121*	*43.5*	*16,100*	*4,952*
Learjet 45	*C-I*	*129*	*47.1*	*20,200*	*5,009*
Mitsubishi MU-300 Diamond	*B-I*	*109*	*43.5*	*14,630*	*5,098*
Sabreliner 75a/80	C-II	128	50.4	24,500	5,278
Dassault Falcon 900	B-II	100	63.4	45,500	5,524
Dassault Falcon 50	B-II	113	61.9	37,480	5,563
Cessna 650 Citation VII	C-II	126	53.6	23,000	5,715
Sabreliner 40	B-I	120	44.5	18,650	5,771
Dassault Falcon 900 EX	C-II	126	63.5	48,300	5,866
Learjet 35/36	C-I	133	39.5	18,300	5,883
Cessna 750 Citation X	C-II	131	63.6	36,100	6,040
Cessna 650 Citation III/VI	C-II	131	53.3	21,000	6,051
Dassault Falcon 2000	B-II	114	63.5	35,800	6,152
Raytheon/Hawker 125-1000 Horizon	C-II	130	61.9	36,000	6,163
Astra 1125	C-II	126	52.8	23,500	6,219
Learjet 55	C-I	138	43.7	21,500	6,230
Learjet 60	D-I	149	43.9	23,500	6,286
Raytheon/Hawker 125-800	B-I	120	51.3	28,000	6,309
Gulfstream IV	D-II	149	77.8	71,780	6,387
Sabreliner 65	C-II	124	50.5	24,000	6,387
Sabreliner 75	C-I	137	44.5	23,300	6,443
Galaxy 1126	C-II	140	58.2	34,850	6,443
Bombardier CL-600/601 Challenger	C-II	125	61.8	41,250	6,667
Gulfstream V	D-III	NA	98.6	89,000	6,992
Bombardier BD-700 Global Express	C-III	126	94	96,000	7,340

Source: Runway lengths derived from Airport NEWS, October 2001, FAA Central Region, which includes business jets modeled for standard conditions. Standard conditions were corrected for SPB conditions.

TAXIWAYS

Taxiways are constructed primarily to facilitate aircraft movements to and from the runway system. While some taxiways are necessary to provide access between the aprons and the runways, others are necessary to provide safe and efficient use of the airfield as activity increases at an airport. As previously mentioned, Advisory Circular AC 150/5300-13A no longer bases taxiway design on Airplane Design Group (ADG). Taxiway design is, however, based on a newly established Taxiway Design Group (TDG), which is based on the overall Main Gear Width (MGW) and the Cockpit to Main Gear (CMG) distance. The TDG for Scappoose Industrial Airpark was determined to be TDG-2.

The airport has two full-length parallel taxiways—Taxiway A on the east side of the runway and Taxiway B on the west side. Both taxiways are 35 feet wide which is the width recommended for TDG-2. Taxiway A's centerline is 240 feet from runway centerline while Taxiway B is 225 feet from centerline at the north end of the runway and 240 feet at the southern 1,100'. The required runway to taxiway centerline separation for ARC B-II and a visibility minimum no lower than ¾ mile is 240 feet. The north end of Taxiway B does not meet the minimum taxiway centerline to runway separation. Consequently, future improvements to Taxiway B should include a 15-foot relocation of the taxiway to the west to meet the 240-foot runway-to-taxiway centerline separation requirement.

The minimum runway-to-taxiway centerline separation requirement increases to 300 feet for ARC B-II and visibility minimums below ¾ mile, which is only needed if the Airport chooses to significantly improve its instrument approach capability. The 300-foot separation requirement also applies for ARC C-II, but with visibility minimums not lower than ¾ mile. An ARC C-II with visibility minimums below ¾ mile requires a runway to taxiway centerline separation of 400 feet. While C-II is not forecast for the Airport within the 20-year planning period, this standard is mentioned for planning purposes should the POSH choose to consider accommodating such aircraft beyond the 20-year planning period as OAP 2007 recommends C-II for airports serving the Urban GA role like Scappoose. This concept will be discussed further in the subsequent chapter on development alternatives.

The width of the connecting taxiways meet or exceed the 35-foot design standard with several 50-foot wide taxiways connecting the apron area and parallel Taxiway A.

Taxiways A2, A3 and B4 provide direct access from the apron to the runway. Current FAA design standards require such direct access be eliminated to reduce the risk of runway incursions. In other words, the connecting taxiways should require the pilot to make turns prior to runway access to increase pilot awareness of the active runway. For example, the taxiway from the apron would connect to a parallel taxiway requiring the pilot to make a 90 degree turn towards another connecting taxiway that provides access to the runway. Consequently, the POSH should plan all future taxiway connectors and consider realignment of others to comply with this guidance.

AIRCRAFT PARKING APRON

An aircraft parking apron should be designed to accommodate transient aircraft as well as locally based aircraft that are not stored in hangars. The number of tiedowns required is based on the number of potential based aircraft as well as an estimated percentage of transient aircraft requiring tiedown space.

It is anticipated that most future based aircraft will be stored in enclosed hangar storage facilities. If hangars are not provided, additional apron space will be required. For planning purposes, it is assumed that 15 percent of locally based aircraft will require space on the parking apron due to some aircraft requiring both hangar storage and parking apron space.

Transient apron space is determined by estimating the percentage of busy-day operations that will require tiedown space at a given time.

A planning criterion of 360 square yards per based aircraft and 500 square yards per transient aircraft is used to determine the apron requirements. These dimensions take into account the space needed for the tiedown space and wingtip clearance, but with minimal area for circulation. Additional space is needed depending on apron and tiedown layout and the areas serving ADG I and ADG II aircraft.

Currently, the largest aircraft apron is located on the west side of the airport and has an area of 15,900 square yards. This apron provides 30 tiedown spaces for small transient as well as small based aircraft. A smaller aircraft apron is located on the east side, has an area of 3,700 square yards and eight tiedowns for small aircraft.

Table 4I illustrates the analysis of apron space need for the planning period.

Table 4I. Apron Space Requirements

	Existing	2017	2022	2032
Operations				
Annual operations	60,000	63,619	67,735	76,149
Peak Month	6,600	6,998	7,451	8,376
Design Day (Average Day of Peak Month)	213	226	240	270
Itinerant Operations (61% of Design Day)	130	138	147	165
Itinerant Aircraft				
Itinerant Aircraft Landing	65	69	74	83
Aircraft Simultaneously Parked (50%)	33	35	37	42
Based Aircraft				
Total Based Aircraft	130	137	145	161
Based Aircraft Using Apron	20	21	22	25
Required Positions				
Total Aircraft Parked	53	56	59	67
Apron Area Requirements (square yards)				
Itinerant Aircraft Apron Area	16,500	17,500	18,500	21,000
Based Aircraft Apron Area	7,200	7,560	7,920	9,000
Total Apron Area Required	**23,700**	**25,060**	**26,420**	**30,000**
Capacity vs. Demand				
Existing Terminal Area Apron Available	19,600	19,600	19,600	19,600
Additional Apron Required	4,100	5,460	6,820	10,400
Demand/Capacity Ratio	121%	128%	135%	153%

Source: WHPacific, Inc.

PAVEMENT CONDITION AND STRENGTH

As indicated in the Inventory chapter, Runway 15-33 has a pavement strength rating of 30,000 pounds single wheel loading (SWL), 50,000 pounds dual wheel loading (DWL), and 90,000 pounds dual tandem wheel loading (DTW). The current strength rating is considered adequate for the current as well as forecast fleet mix to use the airport.

The Oregon Department of Aviation (ODA) prepared a Pavement Evaluation/ Pavement Management Plan for Scappoose Industrial Airpark in October 2012. Pavement Condition Indexes (PCI) and Pavement Condition Ratings (PCR) were calculated for each pavement section based on data collected during visual inspections conducted in July of 2012. The evaluation shows that the runway pavement condition ranges from Fair (PCI of 70) on the Runway 15 end to Satisfactory (PCI of 75) on Runway 33 end. The PCI value is a numerical rating of the pavement condition that ranges from 0 to 100, with 0 being the worst possible condition and 100 being the best possible condition.

As part of the Pavement Evaluation/ Pavement Management Plan for Scappoose Industrial Airpark, Micro PAVER software was used to model projected pavement deterioration rates and create a pavement maintenance program. The model shows that the Runway pavement is expected to have a PCI of 65-66 by 2017 and a PCI rating of 59 by 2022. Typically, a flexible pavement overlay is required for runways with a PCI rating between 40 and 65. Chapter Two, Inventory, provided exhibits identifying the PCI ratings by specific section numbers.

A Five-Year Global Maintenance and Rehabilitation Plan was created for the Airport as a result of the evaluation and software modeling. This Master Plan recommends that the Five-Year plan be implemented (**Table 4J**). Additionally, based on the software modeling, the Master Plan recommends a runway overlay by or prior to 2022. Scappoose participates in the ODA sponsored Pavement Maintenance Program (PMP) and 2013 the program identified that a slurry seal of the runway was needed. The slurry seal it was placed along with new runway markings in September 2013. This will help prolong the life of the pavement.

Table 4J. Taxiway and Apron Pavement Recommendations

Section Number	Section Name	PCI	PCR	Distresses	Recommended Action
A04SC-01	Apron 04	44-45	Poor	Block Cracking	Reconstruct with 3" AC over 10" Aggregate Base
T06SC-01	Taxiway 06	44	Poor	Raveling Block Cracking	Reconstruct with 3" AC over 10" Aggregate Base
T04SC-01	Taxiway 04	22	Serious	Raveling Block Cracking Weathering	Reconstruct with 3" AC over 10" Aggregate Base
T05SC-01	Taxiway 05	4	Failed	Raveling Alligator Cracking Depression Block Cracking	Reconstruct with 3" AC over 10" Aggregate Base

Source: ODA 2012 Pavement Evaluation/ Pavement Management Plan
Note: Section numbers are shown in Chapter Two, Inventory.

The Pavement Management Plan recommends slurry seal treatments for all other Scappoose Industrial Airpark pavements not slated for reconstruction.

Scappoose Industrial Airpark is subject to airport pavement inspection requirements detailed in FAA Grant Assurance Number 11. A visual pavement inspection is required every three (3) years, according to the methodology specified in ASTM D5430. Additionally, monthly "drive-by" inspections must be conducted and recorded, noting any unforeseen changes. Scappoose Industrial Airpark is due for its next visual inspection in 2015 and the next PMP cycle in 2016.

OTHER AIRSIDE DESIGN STANDARDS

Several design and dimensional standards outlined by the FAA should be considered in the planning and design of airports. A summary of the standards that apply or might apply (through and beyond the planning period) was provided in Table 3E, Existing Conditions and Design Standards.

Runway to Parallel Taxiway Separation: The purpose of this separation is to provide adequate wingtip clearance. As previously mentioned, the current RDC of B-II requires a separation of 240 feet. Sections of the north end of Taxiway B do not comply with this separation as they are at 225 feet from the runway. The separation requirement increases to 300 feet for visibility minimums lower than ¾ mile or for C-II standards. Visibility minimums lower than ¾ mile combined with C-II standards require a 400-foot separation.

Runway Safety Area (RSA): The identification of the existing and future RSA at an airport is important to ensure that the RSA is located on airport property and is properly cleared and graded to comply with FAA standards. RSAs are of particular importance to the FAA and receive high priority funding since they enhance the safety of aircraft that overshoot, undershoot, or veer off the runway. The RSA, which is a cleared and graded area centered about the runway centerline, is determined by the RDC. The current RDC of B-II requires a RSA 150 feet wide that extends 300 feet beyond the runway end. These requirements increase to a width of 300 feet and a 600 feet length beyond runway end for visibility minimums lower than ¾. C-II standards require a 500 feet wide RSA that extends 1,000 feet beyond runway end. ***The existing RSA at Scappoose Industrial Airpark is 150 feet wide and extends 300 feet beyond runway end.***

Runway Object Free Area: Like RSA, the OFA is centered on the runway centerline, extends beyond the runway ends, and is determined by the RDC. The OFA must remain clear of objects at the RSA elevation, but it does not have a grading requirement. ***The existing 500 feet wide OFA that extends 300 feet beyond the runway end meets the requirements for RDC B-II.*** These requirements do increase for lower visibility minimums or for an upgrade to C-II.

Obstacle Free Zone (OFZ): The runway OFZ is airspace centered on the runway centerline and extending 200 feet beyond the runway end. ***The existing 400 feet OFZ at Scappoose Industrial Airpark is sufficient for operations by large aircraft.***

Runway Protection Zone (RPZ): The purpose of the RPZ is to enhance the protection of people and property on the ground. The RPZ is a trapezoidal area centered about the extended runway centerline and beginning 200 feet from the runway end. All objects should be clear of the RPZ but limited uses are permitted. The FAA published a memorandum with the subject "Interim Guidance on Land Uses within a Runway Protection Zone" (dated Sep 27, 2012) to clarify the standards. While the FAA acknowledges the challenges that sponsors face with fully controlling the RPZ and resolving any land use issues within the RPZ, the letter specifically states that "…the FAA expects airport sponsors to take all possible measures to protect against and remove or mitigate incompatible land uses." Roadways inside the RPZ are identified as an incompatible land use. It is advisable that the Port of St. Helens have control of the RPZ through fee simple ownership and/or easements. An RPZ with an inner width of 500 feet, an outer width of 700 feet and a length of 1,000 feet is required for B-II and visibility minimums not lower than ¾ mile. These requirements increase for lower visibility minimums or for an upgrade to C-II. Further, coordination with the FAA would be required if the design aircraft changes (upgrade to C-II) and incompatible land uses exist within the RPZ.

Surface Gradient: The maximum allowable longitudinal grade on the existing runway is 2.0% which is associated with Aircraft Approach Category A and B runways. Aircraft Approach Category C runways require that the maximum longitudinal grade be 1.5% with no more than 0.8% within the first and last quarter of the runway length. ***The runway's 0.55% grading does comply with these surface gradient standards.***

Federal Aviation Regulation (FAR) Part 77 – Objects Affecting Navigable Airspace: establishes standards for determining which structures pose potential obstructions to air navigation. It does this through defining specific airspace areas around an airport that cannot contain any protruding objects. These airspace areas are referred to as "Imaginary Surfaces." Objects affected include existing or proposed objects of natural growth; terrain; or permanent or temporary construction, including equipment, which is permanent or temporary in character.

These imaginary surfaces are described in subsequent elements of the master plan and will be graphically depicted on a Part 77 Airspace Drawing in the Airport Layout Plan (ALP) set. These surfaces will be evaluated during the development of the ALP set and any penetrations will be noted and addressed for removal or marking.

One of the important imaginary surfaces for the development alternatives element (next chapter) includes the approach surface, which is applied to each end of each runway based on the type of approach. The approach slope of a runway is 20:1, 34:1, or 50:1, depending on the

sophistication of the approach. FAA approach surfaces are 20:1 for visual approaches, 34:1 for non-precision approaches, and 50:1[1] for precision approaches.

NAVIGATIONAL AIDS

Electronic and visual approach aids provide guidance to arriving aircraft and enhance the safety and capacity of the airfield. Such facilities are vital to the success of the airport and provide additional safety to passengers using the air transportation system. Instrument approaches are categorized as either precision or non-precision. Precision instrument approach aids provide an exact alignment and decent path for an aircraft on final approach to a runway while non-precision instrument approach aids provide only runway alignment information. Most existing precision instrument approaches in the United States are instrument landing systems (ILS) utilizing glide slope and localizer electric equipment installed adjacent to the runway.

With the advent of Global Positioning System (GPS), stand-alone instrument assisted approaches will eventually be established that provide vertical guidance down to visibility minimums currently associated with precision instrument runways. As a result, airport design standards that formerly were associated with a type of instrument procedure (precision/non-precision) are now revised to relate instead to the designated or planned approach visibility minimums.

Instrument procedures published for the airport include a non-precision localizer/distance measuring approach (LOC/DME) to Runway 15 and a VOR/DME non precision approach to Runway 33 and a RNAV (GPS) approach for Runway 15. OAP 2007, Individual Airport Report recommends the establishment of an instrument approach procedure for at least one runway end at Urban GA Airports.

WEATHER REPORTING

The Airport has an Automated Surface Observing System (ASOS), located on the west side of the Airport, that provides weather conditions for the Airport on an hourly basis or when weather conditions change significantly. The ASOS is operated and controlled by the National Weather Service in cooperation with the FAA and Department of Defense (DOD). The ASOS provides weather information on a 24/7 basis through a frequency or call in.

[1] Precision instrument approach slope is 50:1 for inner 10,000 feet and 40:1 for an additional 40,000 feet.

PAVEMENT MARKINGS AND AIRFIELD SIGNAGE

Airport pavements are marked with painted lines and numbers in order to aid in the identification of the runway(s) from the air and to provide information to the pilot during the approach phase of flight. There are three standard sets of markings used depending on the type of runway:

- Basic - For runways with only visual or circle to land procedures. These markings consist of runway designation markers and a centerline stripe.

- Non-precision - For runways to which a straight-in, non-precision instrument approach has been approved. These markings consist of runway designation markers, a centerline stripe, and threshold markings.

- Precision - For runways with a precision instrument approach. These markings consist of the non-precision markings plus aiming point markings, touchdown zone stripes, and side stripes indicating the extent of the full strength pavement.

Depending on the type of aircraft activity and physical characteristics of the pavement, additional markings may be required for any of the three categories above. Runway pavement and displaced threshold markings are painted white, while taxiway pavement markings are painted yellow.

All runway and taxiway markings periodically need to be remarked so that they remain visible to the users of the Airport. Runway markings were re-painted in 2013 as part of a PMP project; all new markings comply with FAA Advisory Circular (AC) 150/5340-1K, *Standards for Airport Markings*. Also, as part of the same PMP project, airport signs were replaced with new LED equipment and all hold line markings were adjusted and repainted to comply with the new sign locations,

AIRFIELD LIGHTING

Airport lighting systems provide critical guidance to pilots during nighttime and low visibility operations. Runway 15-33 is equipped with a medium intensity lighting system that was installed in 2000. The system is working properly and is considered adequate for the planning period. There are Runway End Identifier Lighting (REIL) systems on each runway end that facilitate the identification of the runway ends. These systems are working properly and are considered adequate for the planning period.

Effective ground movement at night is enhanced by the availability of taxiway lighting. The existing taxiway pavements are equipped with centerline reflectors only. As mentioned in the inventory chapter, about half of the reflectors are gone, chipped or faded. OAP 2007 recommends that Urban GA Airports be equipped with Medium Intensity Taxiway Lighting (MITL)

or High Intensity Taxiway Lighting (HITL) at a minimum. This Master Plan will recommend the replacement of the taxiway reflectors with a MITL.

APPROACH LIGHTING AND WIND INDICATORS

In most instances, the landing phase of any flight must be conducted in visual conditions. To provide pilots with visual guidance information during landings to the runway, electronic visual approach aids are commonly provided at airports.

Currently, Runway 15-33 is equipped with a four-box precision approach path indicator (PAPI-4) system on the left hand side of both ends of the runway. However, the Runway 15 PAPI system was temporarily removed from service pending the removal of tree obstructions to the north. ***Once the Runway 15 PAPI system is put back in service, the two PAPI systems are considered to be sufficient for the planning period.***

Wind indicators provide pilots with information as to ground level wind conditions while segmented circles indicate airport traffic patterns. There are two lighted wind indicators on the west side of the airfield – one near Runway 15 end, at one at midfield. A third wind indicator located on the east side of the airfield near the FBO facilities at the north end of the airport is not lighted. It is recommended that this indicator be upgraded to a lighted wind indicator for night time operations.

LANDSIDE REQUIREMENTS

Landside facilities are those that support the airside facilities but are not part of the aircraft operation and movement areas. These facilities are necessary for handling aircraft, passengers and freight while on the ground. These facilities provide the essential interface between the air and ground transportation modes. The capacity of the various components of the landside facilities was examined in order to determine new facilities and improvement needs for the planning period.

TERMINAL BUILDING

The OAP 2007 Recommendations for Urban GA Airports include the provision of a general aviation terminal building. It must be noted that although the airport does not have a terminal building, the FBO and other businesses operating at the airport do provide the range of facilities and services that are normally provided in a general aviation terminal building.

Additionally, although the airport provides vending machines (minimum recommendation of OAP for Urban GA Airports), many survey responders indicated that the provision of a café or restaurant would be a welcomed improvement.

HANGARS

The demand for hangar facilities typically depends on the number and type of aircraft expected to be based at the airport. Hangar facilities are generally classified as T-hangars or conventional hangars. Conventional hangars can include individual hangars or multi-aircraft hangars. These different types of hangars offer varying levels of privacy, security, and protection from the elements. Demand for hangars varies with the number of aircraft based at the airport. Another important factor is the type of based aircraft. Owners of smaller single-engine aircraft usually prefer T-hangars, while owners of larger, more expensive and sophisticated aircraft will prefer conventional hangars. The weather also plays a role in the demand for hangar facilities. For planning purposes, it is necessary to estimate hangar requirements based upon forecast operational activity. However, hangar development should be based upon actual demand trends and financial investment conditions.

OAP 2007 recommends that Urban GA Airports provide, at a minimum, hangar storage space for 75% of their based aircraft. The State plan recommends that hangar space be provided for 100% of based aircraft, if possible. Some aircraft owners will choose to tiedown their aircraft due to operational needs, hangar availability and/or hangar rental rates. Generally, aircraft that will choose the tiedown option are single engine aircraft. Most multi-engine aircraft, helicopters and business jets will be stored in conventional hangars.

Based on the above, and for the purposes of this analysis, it is assumed that 90 percent of single-engine aircraft will be stored in T-hangars, 5 percent in conventional hangars and the remaining 5 percent will be on tiedowns. Additionally, it is assumed that 100 percent of multi-engine, helicopters and business jets will be stored in conventional hangars. A planning standard of 1,200 square feet per single engine aircraft has been used along with a planning standard of 3,000 square feet per multi-engine aircraft, jet or helicopter. Since portions of conventional hangars are also used for aircraft maintenance and servicing, requirements for maintenance/service hangar area were estimated using a planning standard of approximately 15 percent of the total hangar space needs. **Table 4K** illustrates the results of the hangar storage requirements.

Table 4K. Hangar Storage Requirements

	Current Need	Short Term	Intermediate Term	Long Term
BASED AIRCRAFT				
Single Engine	114	118	124	134
Multi-engine	2	3	3	4
Jet	0	1	2	4
Helicopter	2	3	3	5
Other	12	12	13	15
AIRCRAFT TO BE HANGERED				
Single Engine	108	112	118	127
Multi-engine	2	3	3	4
Jet	0	1	2	4
Helicopter	2	3	3	5
Other	0	0	0	0
HANGAR POSITIONS				
T-hangar	103	106	112	121
Conventional	10	13	14	20
Total	**112**	**119**	**126**	**140**
HANGAR AREA REQUIREMENTS (s.f.)				
T-hangar Area	123,120	127,440	133,920	144,720
Conventional Hangar Area	18,840	28,080	31,440	47,040
Maintenance Area	2,826	4,212	4,716	7,056
Total Area	**144,786**	**159,732**	**170,076**	**198,816**
Available *(estimated)*	*150,000*	*150,000*	*150,000*	*150,000*
Additional Area Needed	**-**	**9,732**	**20,076**	**48,816**

Source: Consultant

FIXED BASE OPERATOR

As mentioned in the Inventory chapter, TransWestern Aviation is the FBO providing a range of services at Scappoose Industrial Airpark. These services include fueling service (100 LL and Jet A), aircraft parking (ramp or tiedown), pilot supplies, courtesy transportation, onsite camping, public telephone and restrooms. TransWestern Aviation's website also identifies the provision of courtesy cars, showers, and a conference room and charter air service from Norton Aviation LLC as additional services. TransWestern Aviation is located adjacent to the airport property and accesses the airport with a through-the-fence (TTF) agreement. There are also other businesses at the airport providing a range of aviation-related services (outlined in Chapter 2).

FUEL STORAGE

TransWestern Aviation, the airport's Fixed Base Operator, sells both 100 LL and Jet A fuel. There are two underground fuel storage tanks located next to the FBO. Each tank has a storage capacity of 10,000 gallons.

It is recommended that the airport has the capacity of storing a minimum of two weeks of fuel supply. Fuel purchase records from the FBO at Scappoose Industrial Airpark for the period of 2003-2013 show that the existing storage capacity for Jet A fuel is sufficient for the planning period as the airport currently has the capacity of storing about a half a year supply.

VEHICULAR ACCESS

Access to the main airport entrance is off Honeyman Road and Skyway Drive (the interior airport road on the west side of the airport). A secondary access to the airport is through Moore Road and Airport Road (interior access road on the east side of the airport).

Although the current vehicular access is sufficient for the current airport needs, any future landside developments on the east or west side of the airport must include the provision of vehicular access to serve the needs of the new development.

VEHICULAR PARKING

As outlined in the Inventory Chapter, the primary public auto parking areas for visitors are adjacent to Columbia Aviation on the west side and TransWestern on the east side. The Columbia Aviation parking area consists of 22 parking spaces, including one disability parking space. The Transwestern parking area consists of an estimated 17 parking spaces as many of the markings are faded. Other parking available is adjacent to several Airport tenant facilities as follows:

- Other west side public parking: 28 spaces. These spaces consist of 10 general parking spaces outside the gate adjacent to the corner of the Sport Copter building which is often used by Sport Copter and Oregon Aero visitors, 16 general parking and two handicapped parking spaces on the west side of the Sherpa building.

- Other east side public parking: 31 spaces plus numerous parking spaces available in the grass. Paved parking is available next to the NW Antique Airplane Club facilities and extending southward to nearby tenants.

- Restricted access parking areas on the west side: 32 spaces. Auto parking is available adjacent to the Sport Copter and Oregon Aero buildings on the aircraft apron side of the buildings.

- New Oregon Aero building parking: 37 spaces. During the master planning study, a new Oregon Aero building was constructed with adjacent auto parking to provide 37 additional parking spaces, including two disability parking spaces.

EMERGENCY SERVICES AND SECURITY

EMERGENCY SERVICES AND LAW ENFORCEMENT

There are no aircraft rescue and firefighting (ARFF) facilities located at Scappoose Industrial Airpark. ARFF services are the responsibility of the Scappoose Fire Protection District, a combination of career and volunteer firefighters. This station is located on Highway 30, approximately two miles from the airport and has an estimated response time of less than 8 minutes.

Based on FAA regulations, Scappoose Industrial Airpark is not required to provide Aircraft Rescue and Fire Fighting (ARFF) since the Airport does not have the commercial passenger service that would require a Part 139 certificate.

The City of Scappoose Police Department provides law enforcement support for the Airport. The police department provides random patrols of the Airport, and no suspicious activity has been reported by airport management in recent history.

AIRPORT SECURITY

The security needs of general aviation airports and their available resources are different than those of airports with airline service. The Transportation Security Administration, realizing these differences, created an office focused solely on security issues affecting general aviation. To guide airport sponsors in determining the security enhancements needed at their airports, the TSA published Security Guidelines for General Aviation Airports (IP – 001) in May 2004. The document contains an "Airport Characteristics Measurement Tool" that uses points to assess security risks for different airport characteristics. **Table 4L** summarizes the results of the Scappoose Industrial Airpark assessment.

Table 4L. GA Airport Security Assessment – Scappoose Industrial Airpark

Security Characteristics	*Public Use Airport*
Location	
Within 30 nm of mass population areas	5
Within 30 nm of a sensitive site	4
Based Aircraft	
Greater than 101 based aircraft	3
Runways	
Runway length equal to or greater than 5,000 feet	5
Asphalt or concrete runway	1
Operations	
Over 50,000 annual aircraft operations	4
Part 135 operations	3
Flight training	3
Total	28

Source: TSA Security Guidelines for GA Airports, Consultant

The results of the existing conditions assessment place the Airport in the low end of a TSA category that covers a point range of 25 to 44 points with the following recommendations for security enhancements:

- Signs
- Documented Security Procedures
- Positive Passenger/Cargo/Baggage ID
- All Aircraft Secured
- Community Watch Program
- Contact List
- All recommendations in 0-14 point category
- LEO (Law Enforcement Officer) Support
- Security Committee
- Transient Pilot Sign-In/Out Procedures
- Access Controls
- Lighting System
- Personnel ID system
- Vehicle ID system
- Challenge Procedures

The Airport has some of these security enhancements in place today, but should consider integrating and enforcing these recommendations.

FENCING AND GATES

There are four restricted access gates at the Airport—three on the west side and one on the east side. These gates require an access code to activate. On the west side, a gate is located just south of the Sherpa parking area providing access to the four banks of T-hangars at the south end of the building area, one (both a vehicle and pedestrian gate) is adjacent to Columbia Aviation, and another is located near the Sportcopter building.. On the east side, a gate is located near the FBO (TransWestern) facilities.

Perimeter fencing—consisting of 3-strand barbed wire on chain link or metal posts—encompasses the entire Airport. The fencing is in good condition. The fencing and restricted access gates enhance security. The presence of staff at the FBOs and other businesses also enhances security.

UTILITIES AND DRAINAGE

UTILITIES

Utilities at the Airport are briefly discussed here and include: water, sewer, natural gas, electric, and telecommunications.

WATER

Water service is provided by the City of Scappoose through an 18" main in West Lane and a 12" main along Sky Way Drive. In addition, City water service is available in the Aero Business Center through an 8" main along Wagner Ct.

SEWER

Onsite sanitary sewer disposal is via septic systems. The municipal sewer system runs southwest of the runway. Sewer lines run parallel to the southernmost portion of Taxiway B (B6), approximately 150 feet west of Taxiway B6 in the Aero Business Center through a series of lines ranging in size from 21" to 8". These sewer lines run back to the main lines along the Crown Zellerbach Rd to the south of the airport. The closest storm drainage sewer is also located southwest of the runway and runs adjacent to the sewer lines described above. The Port of St. Helens Strategic Business Plan (2012) states the POSH's intention to work with the City of Scappoose to extend sewer lines to allow for future east side expansion.

NATURAL GAS

The local natural gas provider is Northwest Natural Gas. Natural gas service currently does not extend to the Airport site. However, a high-pressure natural gas line is located approximately 1.5 miles away from the Airport site, should there be interest in seeking a gas main extension in the future.

ELECTRICAL

Electrical Power is provided by Columbia River People's Utility District (CRPUD). The Airport is connected to 3-phase power, transmitted via a combination of overhead and underground lines:

- Overhead primary lines extending along West Lane Road
- Overhead primary lines transition into underground primary lines along North Honeyman Road
- Series of overhead primaries along Moore Road, Airport Road and Ring Road connect and travel east
- Underground primary along West Lane Rd extends east to connect to Airport facilities, and south (parallel to southern driveway)

TELECOMMUNICATIONS

Comcast is the Airport's telecommunications and broadband Internet service provider. The Port of St. Helens Strategic Business Plan (2012) states the POSH's intention to improve broadband service to the Airpark.

DRAINAGE

The Airport grade slopes generally from north to south, with stormwater conveyed by inlets and culverts to open fields, drainage ditches, and a few water quality swales. The Airport's runway is a shed section sloping to the east. The west side of the Airport has four recent water quality swales constructed for the new Oregon Aero hangar and the west parking lot (by Columbia Aviation). There are no direct stormwater discharges to any local streams or rivers.

AIRPORT MAINTENANCE

The Port of St. Helens typically provides routine airport maintenance with Port equipment, vehicles, and staff, but also contracts for such services on an as-needed basis. There is no maintenance facility on the Airport so all equipment and vehicles that support Airport maintenance are stored off site.

SUMMARY

This chapter outlined the facilities required to meet aviation demand projected for Scappoose Industrial Airpark through the long-term planning horizon. The next chapter presents the various development alternatives identified to best meet the projected demand and identified facilities' needs.

Chapter Five ALTERNATIVES

Scappoose Industrial Airpark Master Plan Update

The objective of Chapter Five, Development Alternatives, is to identify and evaluate a set of alternatives for the Port of St. Helens (POSH) that not only meet the demand levels identified in Chapter 3, Forecasts, but are also constructible, financially feasible, and environmentally sustainable. A number of realistic airport layouts that incorporate the facilities needs and recommendations identified in Chapter 4, Facility Requirements, are presented and reviewed below.

It should be noted that although the master plan update is limited to a 20-year planning period, the POSH's vision for the development of the Scappoose Industrial Airpark (Airport) extends, as it should, well beyond this planning period. In order to account and protect for the POSH's long-term vision and to ensure flexibility in planning and development to respond to unforeseen needs, the alternatives presented consider the maximum development of the airport property (to include potential acquisitions and land exchanges).

The constraints, opportunities, constructability, economic feasibility and environmental impacts associated with each of the alternatives are discussed and a comparative evaluation of the alternatives is presented.

These alternatives were presented to the Planning Advisory Committee (PAC) for review and discussion during a January 2014 meeting. A public open house followed the PAC meeting so the public could review the alternatives, ask questions, provide comments, and be presented with the PAC's preliminary recommendations for a preferred development alternative. Since the alternatives were evaluated to identify general preferences for both individual items and the overall concepts presented, the resulting preferred alternative included a combination of items from various alternatives.

This Chapter concluded with the Port of St. Helens selection of a preferred alternative on the basis of the presented evaluation, the PAC recommendations, the public input and the POSH's vision for Scappoose Industrial Airpark and its future. The selected alternative, referred to as the preferred alternative, served as the basis for updating the Airport Layout Plan drawing set and the Airport's Capital Improvement Plan addressed in subsequent chapters.

The overall process leading to the selection of the preferred alternative is comprised of the following four key steps:

1. Site analysis to include the identification of opportunities and challenges for development
2. Identification of development concepts/scenarios to guide the layout of development alternatives
3. Comparative evaluation of the development alternatives
4. Selection of a preferred alternative

SITE ANALYSIS

The identification and assessment of the various opportunities and challenges to development at the Airport is necessary to provide the additional framework for identifying potential development alternatives. Development opportunities are those site features that offer flexibility and possibility in development such as undeveloped land. Development challenges are limitations or constraints at or around the Airport that may restrict or prohibit development and/or would require substantial cost, mitigation, and/or complex engineering solutions to overcome. Also notable is that some site conditions may represent both opportunities and challenges. An example of this includes existing roadways adjacent to airport property which may offer opportunities for additional access, but might also limit an airport's ability to expand and/or protect airspace and other surfaces depending on roadway location.

The physical development opportunities and challenges with the greatest influence on the Airport's development potential are outlined here:

Opportunities

- Undeveloped land within the Airport property to the northwest and northeast of the airfield.
- Existing utility infrastructure on both sides of the airfield. This includes potable water west of the runway, sewer, phone, power and fiber optic service lines.
- No significant known or documented environmental issues. However, there are some limited wetlands in the area. There are no noise complaints.
- Undeveloped flight line property to the west and east of the runway.
- Roadways (N. Honeyman Road, Moore Road, and West Lane Road) to provide additional airport access when needed.

Challenges

- Lack of Airport owned flight line property.
- Any future runway extension would require substantial land acquisition.
- Some of the landside developments to the east are within 300 feet of the runway centerline. Future upgrade to the Runway Design Code (RDC) would require demolition and redevelopment of such development.
- Close proximity of Moore Road to the north and N. Honeyman Road to the northwest. Both roads are within the Runway Protection Zone (RPZ) of Runway 15.

Also notable is the levee system. In the aftermath of hurricane Katrina and the breach of the Mississippi River levee in New Orleans, FEMA has mandated a new levee certification process. The Scappoose Drainage Improvement Company (SDIC) is currently undergoing the process of certifying its levee system. The certification process will have an impact on landowners within the district and their ability to purchase flood insurance and additional restrictions and costs for new development. However, the magnitude and extent of such impact has yet to be identified.

The SDIC boundary does cross the Airport property (illustrated in subsequent development alternatives exhibits). Although the potential impacts of the boundary crossing the Airport property have yet to be quantified, the POSH will remain in contact with the SDIC in order to ensure timely understanding of the effects of the recertification process.

DEVELOPMENT ALTERNATIVES

COMMON FEATURES

Common features are developments that are needed for the Airport to comply with the recommendations of AC 150/5300-13A, *Airport Design*, and continue to provide a safe and efficient environment for aircraft operations and related activities. While common features are in all build alternatives, there may be variations in the way they are integrated into the various alternatives. Common features of all alternatives include:

- Realignment of Taxiway B to meet the 240 feet minimum runway centerline to taxiway centerline separation for Runway Design Code (RDC) B-II. Alternative 4 introduces an upgrade in the RDC to C-II, requiring the realignment of Taxiways A and B to a minimum runway centerline to taxiway centerline separation of 300 feet.
- Realignment of taxiway connectors A2, A3, and B4 to eliminate direct access from the apron to the runway.
- Replacement of taxiway reflectors with Medium Intensity Taxiway Lighting (MITL).
- Improvements to the existing infrastructure to the east of the runway to include the enhancement of the fire system and the storm drain system.
- Extension of infrastructure lines to the east side, to support existing and/or future development, including potable water, electricity, fiber optic lines and others.
- Provision of a minimum of 10,400 square yards of additional aircraft apron area to accommodate a total of 67 (existing and additional) aircraft parking positions needed for the planning period.
- Provision of a minimum of 48,816 square feet of hangar space to accommodate a total of 140 based aircraft requiring hangar space by 2032.

ALTERNATIVES

The identification of long-term development alternatives followed the site analysis and identification of common features. As previously mentioned, these alternatives not only address the facility requirements outlined in the previous chapter but also examine potential development beyond the 20-year Master Plan period. The identification of development possibilities in the distant future and beyond the planning period is important for the evolution of a well-defined vision for the airport. This in turn helps prioritize and focus the planning, policy making, and essential actions necessary to achieve the vision and protect the long-term viability of the Airport. Acquiring land and implementing land use controls are examples of steps to protect the Airport and its future development. Otherwise, development around the Airport

could occur that would prohibit, limit, or make financially unattainable the proposed future improvements—improvements that would best meet the needs of local airport private and business users as well as the state and regional air transportation system.

Three build alternatives and a no-build or no action alternative were prepared. The build alternatives presented include both airside and landside development concepts. Although these alternatives do not necessarily exhaust all the variations and development design concepts that may be applied to the Airport, they do provide the appropriate base to produce the "preferred alternative" for the development of the Airport. The selection of a "preferred alternative" most often represents a composite of the alternatives with the most favorable elements from each alternative included. The "No Action" is presented for the purpose of comparison. While no new development is proposed in the No Action alternative, existing facilities are maintained so costs are limited to maintenance costs.

For the three build alternatives, all proposed development follows applicable FAA design standards and FAR Part 77 airspace planning standards. The Airport Reference Code (ARC) is presently B-II and is forecast to remain the same for the planning period. However, the Oregon Airport System Plan recommends that airports identified as Urban GA, like Scappoose, serve C-II aircraft. As a result, two of the three build alternatives represent B-II development and the third alternative supports C-II. For apron and hangar areas intended to serve small aircraft exclusively, design standards for Airplane Design Group (ADG) I are applied.

These alternatives will be reviewed and discussed with the PAC and public so the POSH may consider comments and recommendations prior to the official selection of a "preferred alternative".

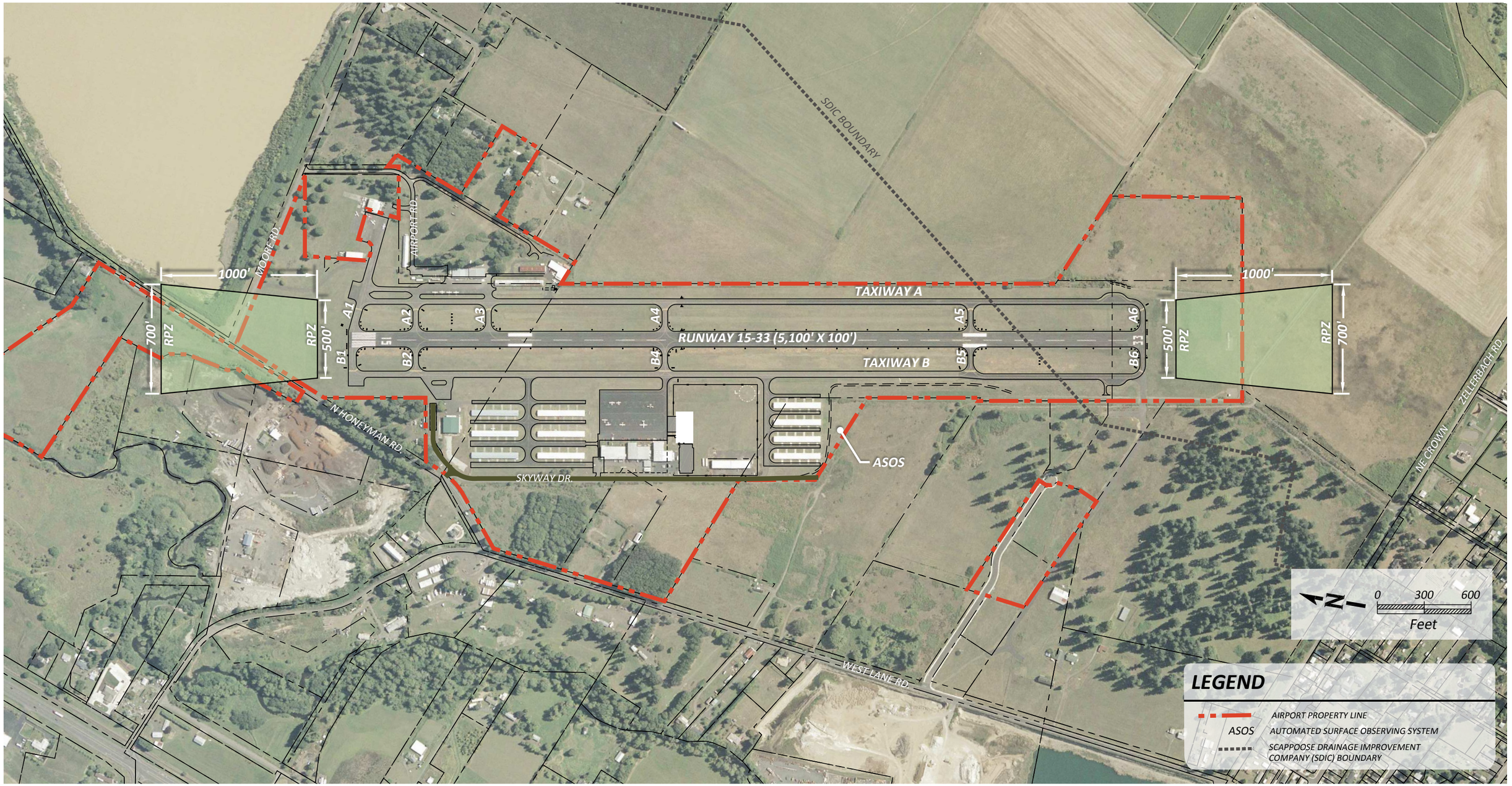
ALTERNATIVE 1 – NO-ACTION ALTERNATIVE

The POSH has the option of maintaining the existing facilities and capabilities of the Airport and not investing in the upgrade of existing or development of new facilities. Under this alternative, the POSH would continue to operate the Airport in "maintenance mode."

This alternative is not feasible nor recommended as it would lead to the inability of accommodating the forecast demand within the planning period. As previously mentioned, additional apron area and hangar space are needed to accommodate the forecast demand.

The No-action alternative, also referred to as the no-build alternative, is presented as a baseline from which the build alternatives are developed and compared.

Exhibit 5A illustrates the No-Action Alternative.



PORT OF ST. HELENS
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SCAPPOOSE INDUSTRIAL AIRPARK

AIRPORT MASTER PLAN UPDATE

Alternative 1
No Action

EXHIBIT 5A

WHPacific
9755 SW BARNES RD. STE 300 PORTLAND, OR 97225 503.626.0455

This section describes the three build alternatives with each alternative addressing both airside and landside components of the Airport such as the runway, taxiways, apron, hangars, and roadways. Of particular interest to the airside options is the location of the Runway Protection Zone (RPZ). In a September 2012 Memorandum, the FAA published "Interim Guidance on Land Uses within a Runway Protections Zone." Generally, the guidance requires that FAA Regional Office (RO) and Airports District Office (ADO) staff coordinate with the National Airport Planning and Environmental Division regarding certain land uses, including public roadways, within the limits of the RPZ as a result of specific actions. The FAA identifies these actions to include:

1. An airfield project (e.g., runway extension, runway shift)
2. A change in the critical design aircraft that increases the RPZ dimensions
3. A new or revised instrument approach procedure that increases the RPZ dimensions
4. A local development proposal in the RPZ (either new or reconfigured)

While the aviation demand forecasts do not support a runway extension or upgrade in the critical aircraft during the planning period, an unanticipated change in demand could trigger a mandatory consultation with the FAA. The required FAA coordination is to focus on finding a solution that addresses the incompatible use within the RPZ. The guidance also states that "This interim policy only addresses the introduction of new or modified land uses to an RPZ and proposed changes to the RPZ size or location. Therefore, at this time, the RO and ADO staff shall continue to work with sponsors to remove or mitigate the risk of any existing incompatible land uses in the RPZ as practical."

For Scappoose, the public roadways in the Runway 15 RPZ are considered an incompatible land use. If one of these roadways (Honeyman or Moore) are improved, the FAA's involvement would follow whether or not any change to the airfield, critical aircraft, or instrument approach occurred. Consequently, the RPZ location is considered as part of the long term development alternatives and associated discussion.

Recent communication with the FAA about the interim guidance and how it should influence an airport sponsor's evaluation of various development alternatives suggests that the airport consider the various implications of the guidance. Presently, the FAA is responding to triggering events, but not possible future triggering events. Further RPZ guidance is anticipated in the next year or so. Alternatives 2 and 4 presented in this section address the issue of the existing roads in the RPZ. Additionally, the FAA has been engaged in the discussion to determine the best approach to handle the existent incompatible land use.

Also notable is Runway 15-33's 100-foot runway width, which is more than the required 75-foot runway width for a Runway Design Code (RDC) B-II. The POSH has elected to maintain the 100-foot width based on the stated needs of airport tenants and to increase the safety of operations at the airport.

ALTERNATIVE 2

As discussed in the Forecasts chapter, Scappoose Industrial Airpark's most demanding aircraft currently belongs to the B-II family or category. Additionally, the most demanding aircraft is forecast to remain one that belongs to the B-II family for the remainder of the planning period. Development concepts provided in this alternative aim at serving aircraft up to B-II, which inherently serves smaller aircraft, too, such as those within the A-I and B-I family that also use the airport on a regular basis. This alternative assumes, as forecast, that the RDC will remain as B-II throughout the planning period. This also means that instrument approach procedures with approach visibility minimums of lower than one mile will not be provided.

Dimensions and separations presented in this alternative comply with those recommended in AC 150/5300-13A for an RDC of B-II and a Taxiway Design Group (TDG) 2. It must be noted that areas (taxilanes and aprons) that are expected to serve B-I aircraft exclusively have dimensions and separations that are associated with B-I.

As mentioned in the Requirements chapter, Moore Road and N. Honeyman Road are within the Runway 15 RPZ. Displacing the threshold by 980 feet to the south is needed to clear the RPZ of these roads. A displaced threshold signifies that the Landing Distance Available (LDA) will be reduced by the distance the threshold is displaced, 980 feet.

Another solution to clearing the RPZ is to relocate the threshold by 980 feet to the south. The relocation of the threshold would eliminate the need for declared distances but would result in a shorter runway with a length of 4,120 feet. If the threshold is relocated, the 980 feet between the existing and relocated threshold would not be available for any landings or takeoffs on either runway end.

Landside development areas shown in this alternative include: an area for a restaurant – mentioned as needed by numerous airport user surveys – or another aviation-compatible development to the west of the runway; an ADG I taxiway and hangar development to the west of the runway; expansion of the aircraft parking apron to the northeast of the airport property; and a new connecting taxiway and hangar development to the east of the runway and adjacent to Airport Road. Alternative 2 also shows various parcels for land acquisition to the west and east of the runway for aviation-compatible development and the acquisition of the property to the south of Runway 33 that falls within the RPZ. This alternative includes the proposed acquisition

of a parcel along the east airport property boundary that runs parallel to the runway—this parcel is similar to the parcel proposed for development in the 2004 Master Plan.

Exhibit 5B illustrates Alternative 2.

ALTERNATIVE 3

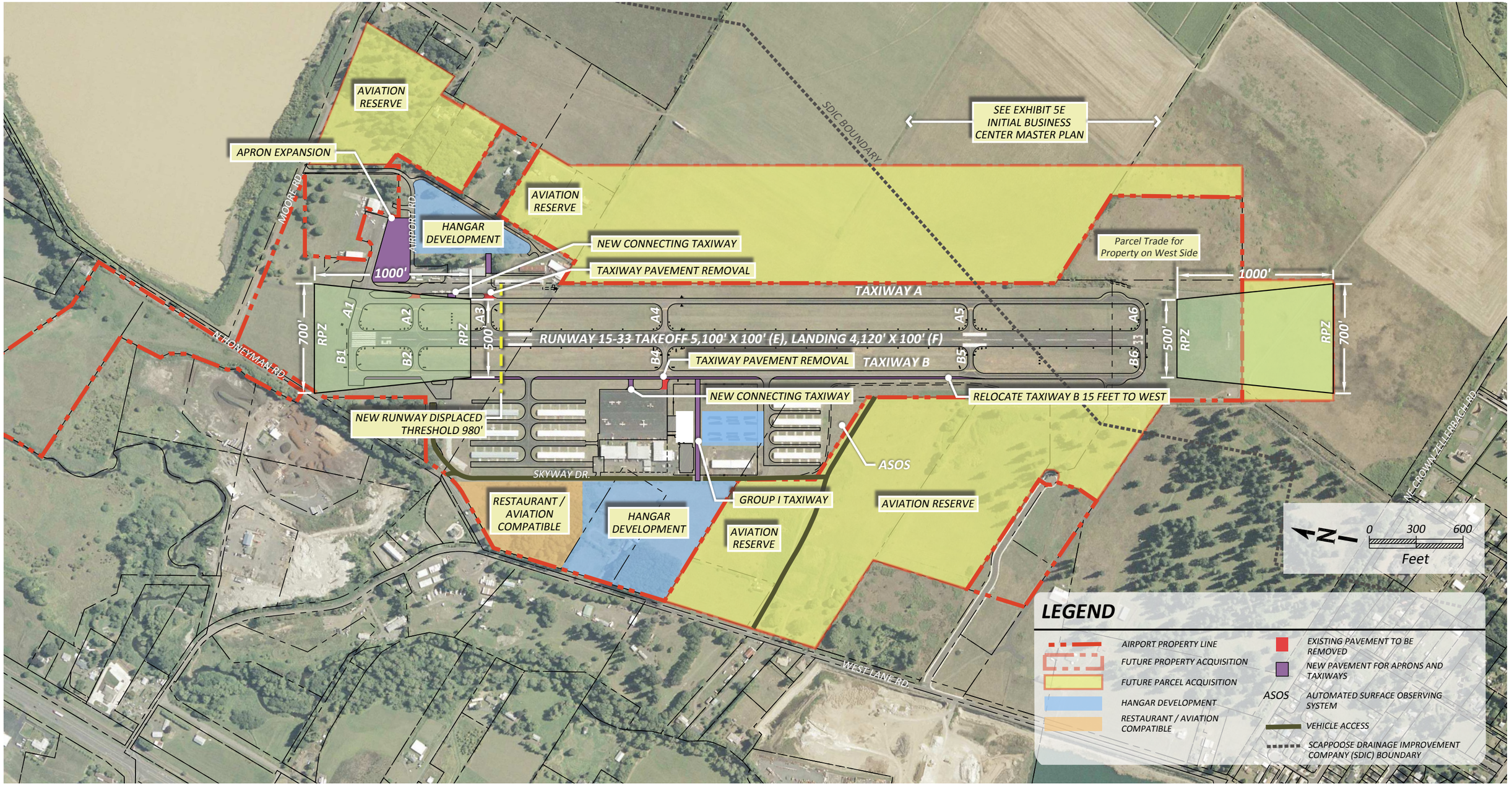
Alternative 3 also assumes that the RDC of B-II will remain unchanged for the planning period, as provided in the Forecasts. This means that the visibility minimum will remain at one mile and the RPZ for both runway ends will remain the same size (500 x 700 x 1,000 feet).

In this alternative, Runway 15-33 is extended 900 feet to the south for a total runway length of 6,000 feet. The 900-foot extension represents the maximum extension possible without NE Crown Zellerbach Road entering the RPZ of Runway 33. As documented in the Requirements chapter, many aircraft that currently use the Airport and are in the ADG I and/or II family would benefit from the proposed runway extension. The extension of the runway to the south would also provide for the extension of Taxiways A and B.

Alternative 3 provides for a significantly larger aircraft parking apron than shown in Alternative 2 to serve the FBO operations to the east of the runway. West of the runway, an ADG I taxiway is proposed to access future landside development, but is located farther south than the location shown on Alternative 2. This connecting taxiway will still serve an area of additional hangar development and aviation reserve. The alternative also provides for a corporate expansion to the south of Oregon Aero.

Land acquisitions east of the runway would provide for aviation reserve areas to be developed as dictated by the demand. West of the runway, land acquisitions would provide for an aviation reserve area adjacent to the proposed hangar development, provide the land necessary for the expansion of the aircraft parking apron to the south of the existing southernmost T-hangars, provide the area necessary to accommodate a future second FBO, and provide the area necessary for an ultimate helicopter operations area. Land acquisition to the south of the runway would ensure that Runway 33 RPZ is within the Airport property.

Alternative 3 is illustrated in **Exhibit 5C**.



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Alternative 2

EXHIBIT 5B

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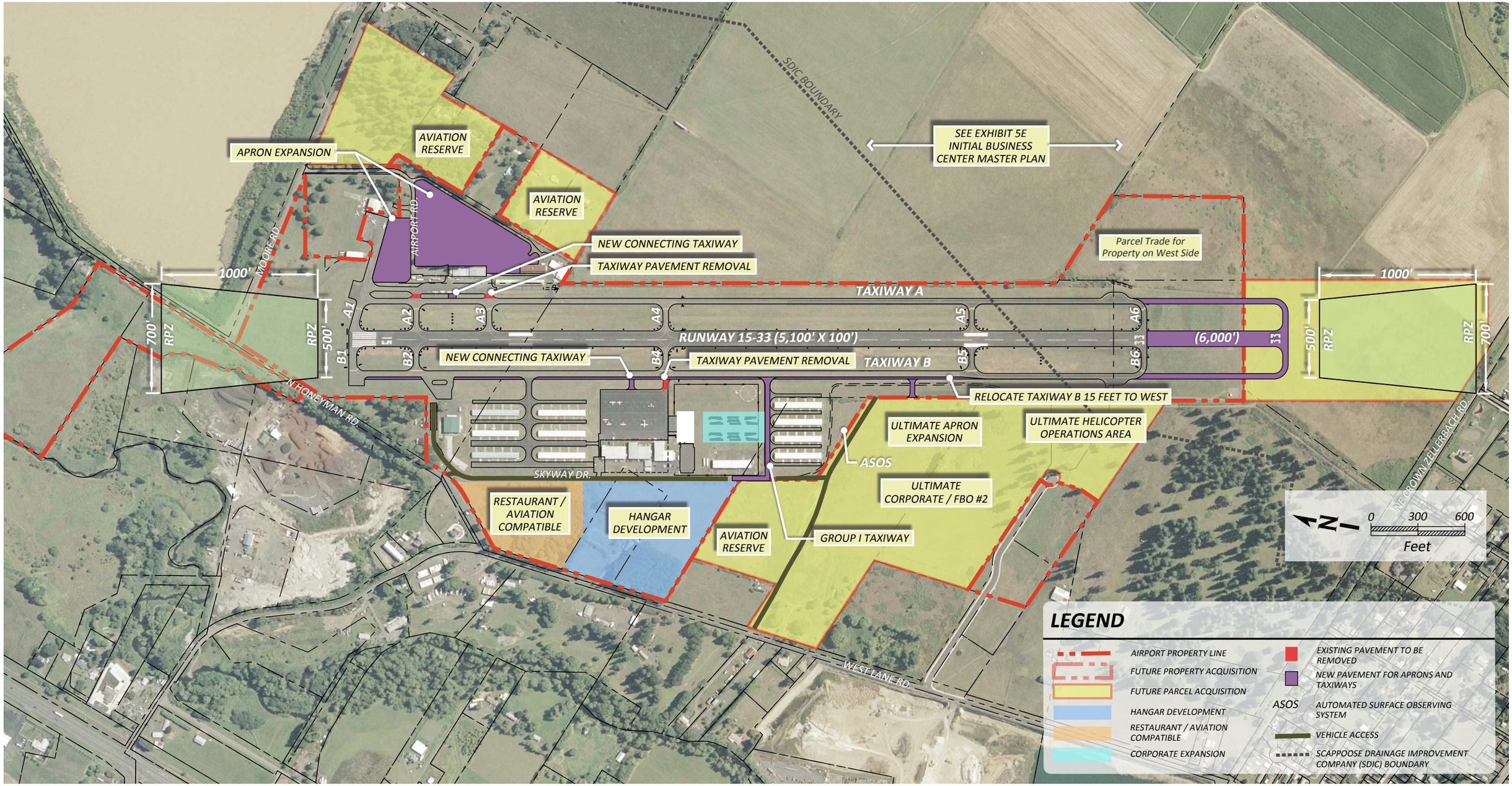

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Alternative 3

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ALTERNATIVE 4

As mentioned in the Requirements, Scappoose Industrial Airport is included in the State system plan and is classified as an Urban General Aviation (GA) Airport. OAP 2007 recommends that, at a minimum, an Urban GA airport has an Airport Reference Code (ARC) of C-II.

Alternative 4 assumes that the ARC would be upgraded to C-II to meet the minimum recommendation of OAP 2007. Since OAP 2007 does not touch on the approach visibility minimums, it is assumed that the visibility minimums would remain at one mile or greater. The resulting RDC, C-II, would require the increase of the RPZ dimensions on both ends (1,700 x 500 x 1,010 feet for C-II versus 1,000 x 500 x 700 feet for B-II). The larger RPZ dimensions would mean that even with Runway 15 relocated 980 feet to the south, both Moore Road and N. Honeyman Road would still cross it. Additionally, the new RPZ would extend beyond the Airport property, requiring the acquisition of avigation easements within the RPZ to the north of Moore Road and to the west of N. Honeyman Road. For Runway 33, the larger RPZ would translate to a larger fee simple and/or avigation easement acquisition to ensure that the RPZ falls within the Airport property or within airport-controlled property.

An RDC of C-II would require a 300-foot taxiway centerline to runway centerline separation (RDC of B-II requires a 240-foot separation). This would require the relocation of both Taxiways A and B to a distance of 300 feet from the Runway threshold. As the taxiways are shifted, the taxiway safety and object free areas are also shifted away from the runway and closer to landside development areas. Other recommended Runway separation dimensions such as the runway object free area would also increase. While the relocation of Taxiway B would have a minimal impact on the development west of the runway, the relocation of Taxiway A would have a considerable impact on the facilities and aircraft parking apron to the east of the runway. Many of these facilities would have to be removed, relocated or redeveloped due to them falling within the area covered by the relocated taxiway or its relocated safety and object free areas.

Alternative 4 is illustrated in **Exhibit 5D**.

SCAPPOOSE AIRPORT BUSINESS CENTER

All the alternatives presented above reference **Exhibit 5E,** Initial Business Center Master Plan. Airpark Development LLC owns a large parcel located to the east of the runway. The company has prepared initial plans for the development of the parcel. The development plan is illustrated in Exhibit 5E.

Additionally, some of the property acquisitions shown west of the runway are currently owned by Airpark Development LLC. A parcel in the southeast corner of the Airport property is labeled, throughout the three build alternatives, as “Parcel Trade for Property on West Side.” It is

assumed that due to Airpark Development LLC's ownership of the large parcel to the east, they would be interested in trading parcels they own on the west side for this particular parcel. However, Alternative 2, presented earlier, does show acquisition of a large portion of their property on the east side similar to the 2004 Airport Master Plan.

COMPARATIVE EVALUATION

In order to assist the public, PAC and POSH in assessing and comparing the various alternatives, an alternatives evaluation matrix is presented in **Table 5A**.

MAGNITUDE OF COST COMPARISON

It must be noted that detailed cost estimates were not prepared for each of the alternatives; however, the alternatives are compared in order of magnitude costs. While the landside costs for all build alternatives are comparable, the runway extension for Alternative 3 provides a major additional cost that is not associated with Alternative 2. Additionally, Alternative 4 has the highest cost as it requires the relocation of Taxiways A and B and the redevelopment of landside development to the northeast of the runway. Also, the land purchases associated with this alternative exceed those associated with Alternative 3 which in turn exceeds the land purchase costs associated with Alternative 2.

ENVIRONMENTAL COMPARISON OF ALTERNATIVES

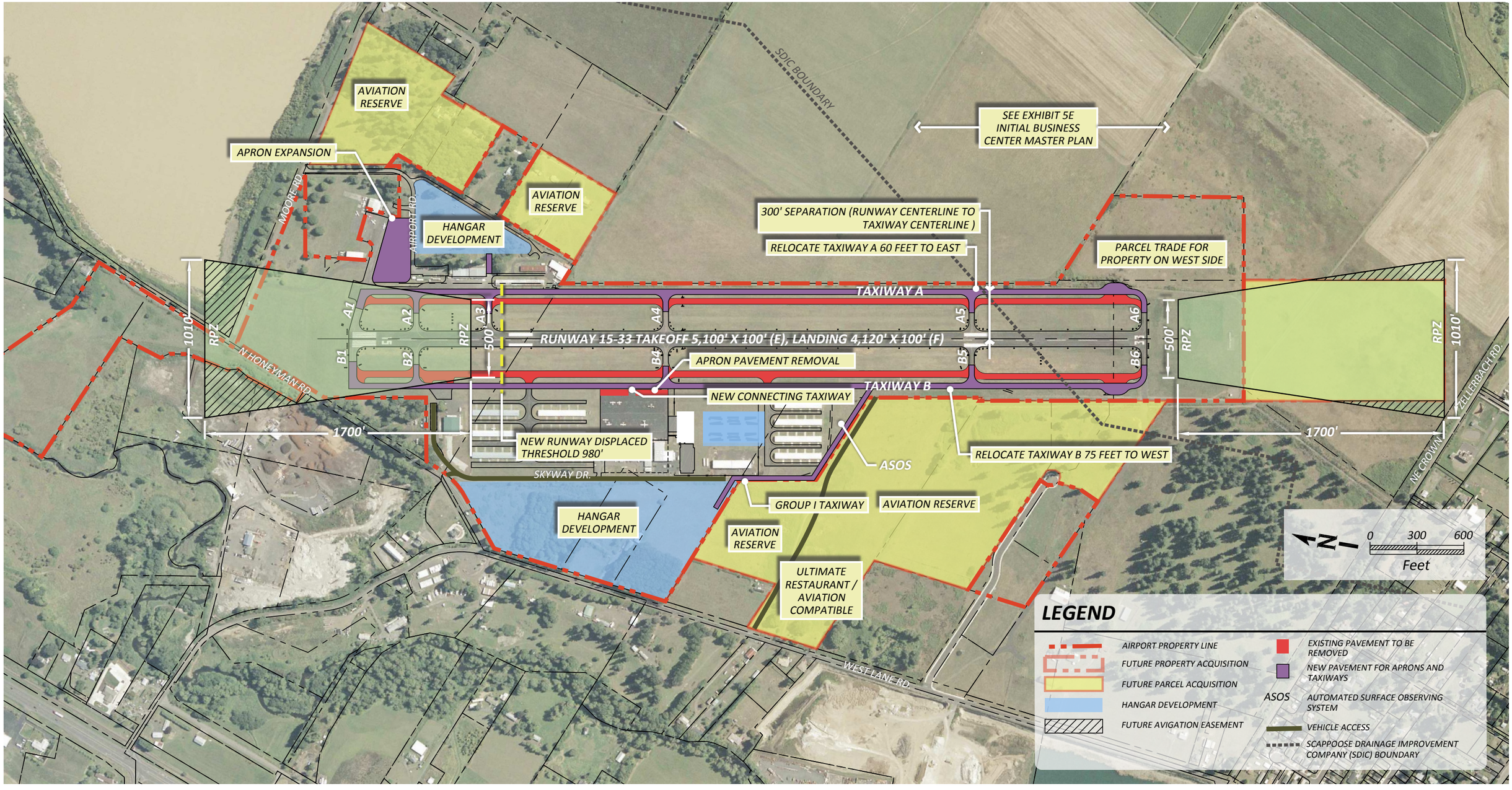
ENVIRONMENTAL SCREENING OF ALTERNATIVES

Each alternative was reviewed to assess its relative environmental impact, as well as identify any environmental constraints that may prohibit development. The results of this analysis are presented in **Table 5B**.

Each alternative presents an array of environmental opportunities and constraints. The following discussion summarizes the potential environmental concerns associated with each alternative.

ALTERNATIVE 1 – NO ACTION

The No-Action Alternative, also referred to as the no-build alternative, does not propose any new use designations on the airport. It includes only maintenance for the next 20 years. The No-Action Alternative does not present land use compatibility concerns, noise concerns, changes to the social environment, or direct threats to plant and animal communities. In terms of overall impact, **this alternative has the least impact to the existing natural and built environments.**



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AIRPORT MASTER PLAN UPDATE

Alternative 4

EXHIBIT 5D

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SCAPPOOSE AIRPORT BUSINESS CENTER

AIRPARK DEVELOPMENT LLC ILLUSTRATIVE MASTERPLAN AUGUST 2012

courtesy of:
Airpark Development LLC
OTAK
August 2012

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AIRPORT MASTER PLAN UPDATE

Initial Business Center Master Plan

EXHIBIT 5E

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Table 5A. Alternatives Evaluation Matrix

	Alternative 1 - No Action	Alternative 2	Alternative 3	Alternative 4
Ultimate RDC	B-II	B-II	B-II	C-II
Satisfies Forecast RDC	Yes	Yes	Yes	Yes
Meets Minimum State Recommendations for ARC	No	No	No	Yes
Ultimate Runway Length	5,100 feet	Declared Distances for RWY 15: TODA: 5,100 feet. LDA: 4,120	6,000 feet	Declared Distances for RWY 15: TODA: 5,100 feet. LDA: 4,120
Required Runway Centerline to Taxiway Centerline Separation	240 feet	240 feet	240 feet	300 feet
RPZ Dimensions	(1,000 x 500 x 700) feet	(1,000 x 500 x 700) feet	(1,000 x 500 x 700) feet	(1,700 x 500 x 1,010) feet
Incompatible Land Use in RPZ	Yes - Roads	No	Yes - Roads	Yes – Avigation Easement needed
Requires Land Acquisition	No	Yes	Same as Alt 2 and additional land to support RWY 33 extension and new RPZ	Same as Alt 2 and additional avigation easements to the north and south
Accommodates Forecast Demand	No	Yes	Yes	Yes
Provides for Expansion beyond the 20-year period	No	Yes	Yes	Yes
Opportunity for Phased Development	N/A	Yes	Yes	Yes
Associated Major Cost	Maintenance – least cost of all alternatives	Least Cost among build alternatives	Costlier than Alt 2 but less cost than Alt 4	Most Cost

Table 5B. Development Alternatives - Environmental Constraints and Impacts[1]

Impact Categories[2]	No-Action Alternative	Alternative 2	Alternative 3	Alternative 4
Air Quality	No change from existing. *1*	No apparent issues. *2*	No apparent issues. *2*	No apparent issues. *2*
Biotic Resources	No change from existing. *1*	No apparent issues. *2*	No apparent issues. *2*	No apparent issues. *2*
Land Use Impacts	No change from existing. *1*	Perception of community character change. *2*	Greater perception of community character change. *3*	Perception of community character change. *2*
Construction Impacts	No construction. *1*	Minimal issues. *2*	Runway/taxiway extension noise and airport operation impacts 3	Minimal issues. *2*
Section 4(f) Resources	No change from existing. *1*	No apparent issues. *2*	No apparent issues. *2*	No apparent issues. *2*
Threatened and Endangered Species	No change from existing. *1*	No apparent issues. *2*	No apparent issues. *2*	No apparent issues. *2*
Energy Supplies, Natural Resources and Sustainability	No change from existing. *1*	No apparent issues. *2*	No apparent issues. *2*	No apparent issues. *2*
Environmental Justice	No increase in off-site impacts. 1	No apparent issues. 2	No apparent issues. 2	No apparent issues. 2

[1] The small italic number in each cell represents the qualitative rank of each alternative for the specific category. Where all alternatives are approximately equal, a value of 2 was given. A value of 1 represents the least impacting alternative or a positive impact; a value of 4 represents the greatest impact. A summing of these values appears at the bottom of this table, which in turn provides a subjective ranking of the four alternatives. Induced economic impacts (jobs, tax revenue, et cetera) are considered positive impacts.

[2] The analysis is divided into 21 impact categories and is examined per FAA Order 1050.1E and guidance from the Council on Environmental Quality.

Impact Categories[2]	No-Action Alternative	Alternative 2	Alternative 3	Alternative 4
Farmlands	No change from existing. *1*	No apparent issues. *2*	Possible loss of productive farmland in southern RPZ. *3*	Possible loss of productive farmland in southern RPZ. *3*
Hazardous Materials	No change from existing. *1*	Risk for spills is associated w/ increased landside development. *2*	Risk for spills is associated w/increased landside development. *2*	Risk for spills is associated w/increased landside development. *2*
Historical, Archaeological and Cultural Resources	No change from existing. *1*	No apparent issues. *2*	No apparent issues. *2*	No apparent issues. *2*
Induced Socioeconomic Impacts	No change from existing. *4*	Development of landside improvements would create jobs and rent revenue. *3*	Development of landside improvements would create jobs and rent revenue. RW/TW extension would create construction jobs. *1*	Development of landside improvements would create jobs and rent revenue. TW construction would create jobs. *2*
Light Emissions and Visual Effects	No change from existing. *1*	No apparent issues. *2*	No apparent issues. *2*	No apparent issues. *2*
Energy Supply & Natural Resources	No change from existing. *1*	No apparent issues. *2*	No apparent issues. *2*	No apparent issues. *2*
Noise	No change from existing. *2*	Threshold relocation may reduce airport noise footprint. *1*	Runway extension would expand airport noise footprint. *3*	Threshold relocation may reduce airport noise footprint. *1*
Social Impacts	No change from existing. *1*	Increased development could increase surface traffic demand. Perception of change in community structure. *2*	Increased development could increase surface traffic demand. Perception of change in community structure may cause residents to move from southern neighborhood. *3*	Increased development could increase surface traffic demand. Perception of change in community structure. *2*
Solid Waste	No change from existing. *1*	No apparent issues. *2*	No apparent issues. *2*	No apparent issues. *2*
Water Quality	No change from existing. *1*	No apparent issues. *2*	No apparent issues. *2*	No apparent issues. *2*

Impact Categories[2]	No-Action Alternative	Alternative 2	Alternative 3	Alternative 4
Wetlands	No change from existing. *1*	No apparent issues. *2*	No apparent issues. *2*	No apparent issues. *2*
Cumulative Impact	No change from existing. *1*	No apparent issues. *2*	No apparent issues. *2*	No apparent issues. *2*
Controversy	No change from existing. *1*	Some issues related to community character and growth. *2*	Community character and growth issues plus noise. *3*	Some issues related to community character and growth. *2*
Total ranking	25	42	47	42

ALTERNATIVE 2

This alternative includes property acquisition and development plans for hangars, aviation-compatible uses and aviation reserves. The runway threshold on the north end would be displaced by 980 feet, resulting in a shortened runway for landing (4,120 feet compared to 5,100 for take-off). A portion of parallel Taxiway B would be relocated 15 feet to the west and several new taxiways and taxilanes would be built. Development is proposed on the east and west side. The northeast corner would have an expanded apron and additional hangars.

The RPZ dimensions would be 500 feet at the runway end, 700 feet at the outer end, and 1,000 feet in length. The change to the threshold would remove N. Honeyman Road from the RPZ. FAA typically discourages roads in RPZs. The southern RPZ would remain as it is today.

Development of the vacant land in POSH ownership, along with the development of new taxiways would increase impervious surface. Taxiway relocation would require minor revisions to the on-airport drainage system. The current system, with minor modifications, should be able to accommodate increased stormwater from new impervious surface.

The increase in hangar development, as well as new on-airport commercial and employment uses, may be perceived as a change in character by local residents. Development of the landside areas may also increase surface transportation demand, contributing to peak period congestion, or the appearance thereof for area residents.

This alternative has the least environmental impact of the three build alternatives.

ALTERNATIVE 3

This Alternative is similar to Alternative 2 in the allocation of future uses on the west side of the airport, but drops the proposed acquisition of property along the existing eastern airport property boundary that runs parallel to the runway. The hangar development in the northeast corner is replaced with an apron in this alternative. There would be some changes to connector taxiways. A portion of Taxiway B would be relocated 15 feet to the west, as in Alternative 2. The major difference between this alternative and the others is the extension of the runway 1,000 feet to the south.

The RPZ dimensions would be 500 feet at the runway end, 700 feet at the outer end, and 1,000 feet in length. The northern end Runway 15 RPZ would include a section of N. Honeyman Road and a small portion of a pond.

Development of the vacant land currently in POSH ownership would be similar to Alternative 2. The land at the southern end of the west side development area which is designated Aviation

Reserve in Alternative 2 is proposed for corporate aviation, a second FBO and a helicopter operation area, but such development is anticipated beyond the 20-year planning period when demand has grown to support such expansion. These uses may be more intensive and create off-site impacts for noise, aviation traffic and surface transportation impacts compared to the other build alternatives. The runway extension would likely move noise generation closer to a developing residential area under the other alternatives. The runway extension and the more intensive use proposal may generate public controversy, especially as compared to the other build alternatives.

Impervious surface increases would be the greatest under this alternative because of the extension of the runway and parallel taxiways and the apron increase in the northeast corner. Substantial changes to the existing stormwater collection system, would be needed to accommodate increased stormwater from new impervious surface.

This alternative has the greatest impact of the Build Alternatives.

ALTERNATIVE 4

The landside development for this alternative is similar to Alternative 2 on the west side and northeast area. The threshold would be displaced 980 feet on the north end, as in Alternative 2. The key difference in this alternative is the increase in centerline separation for the runway and both parallel taxiways to 300 feet each. The RPZs would also be expanded to 500 feet on the runway ends, 1,010 feet on the outer ends, and 1,700 feet long. While development cannot occur in the RPZs, existing uses may be displaced.

The northern RPZ would include N. Honeyman Road and a corner of the pond.

Development of the vacant land in POSH ownership would be identical to Alternative 2. Because of the relocation of both taxiways, the impervious surface increase may be slightly larger than in Alternative 1. The existing stormwater collection system, with minor modifications, should be able to accommodate increased stormwater from new impervious surface.

The increase in hangar development, as well as new on-airport commercial and employment uses may also be perceived as a change in character by local residents. Development of the landside areas may also increase surface transportation demand, contributing to peak period congestion, or the appearance thereof for area residents.

This alternative is similar to Alternative 2 in environmental impact.

As shown in Table 5B, the No-Build Alternative has the least impact, as it does not change the airport from its current configuration or change off-site impacts. Alternatives 2 and 4 have the

least impact of the build alternatives because these alternatives have no runway extension, but more land acquisition for aviation reserve landside development on the east side is shown in Alternative 2. However, Alternative 4 has more construction (taxiway relocation) on the west side than Alternative 2 which contributes to jobs, but may have farmland impact due to the expanded RPZs.

Alternative 3 is shown as having the greatest impact. This is due to the potential for noise increases, community changes and potential for controversy associated with the runway extension.

NOISE IMPACTS

Although a runway extension is shown in Alternative 3, such an extension is not needed for the 20-year planning period as discussed in the Forecasts and Requirements chapters. The runway extension is shown to illustrate the land acquisitions and avigation easements that need to be secured in order to protect for such an extension in the distant future – beyond the planning period. In addition, the full impact of the adjacent Business Park development is unknown at this time. Should demand for additional runway length be justified earlier than indicated the property would be available to accommodate the expansion.

The current ARC for Scappoose Industrial Airpark is B-II and it is forecast that the ARC would remain the same throughout the planning period. The previous Master Plan, prepared in 2004, also concluded that the Airport's ARC was B-II and it was forecast to remain as such through 2024. Additionally, the fleet mix percentages of aircraft operating at the airport are similar to the percentages identified in the 2004 Master Plan.

The 2004 Master Plan estimated that in 2002, the Airport had 75,075 total annual operations. Furthermore, the 2004 Master Plan forecasts estimated that total annual operations would reach 82,900 operations by 2007. Additionally, the previous ALP set provided the noise contours for 2002 and 2007 and determined that the noise levels generated by the Airport are below those acceptable for the various land uses around the Airport.

Given that the current Master Plan Update estimates the total 2012 annual operations at 60,000 and forecasts that this number would increase to 63,619 operations in 2017, and given that the fleet mix using the Airport remains practically the same as the fleet mix using the Airport in 2002, and since a runway extension is not warranted nor expected in the next five years, it was determined that noise contours for 2012 and 2017 would be smaller than those shown on the previous Master Plan for 2002.

Given that the land use of the areas covered by the contours provided in the previous Master Plan has not changed and given that the current (2012) as well as five-year (2017) noise contours

cover a smaller area, it is concluded that noise levels associated with airport operations are within the acceptable noise level allowable based on the land use.

PREFERRED ALTERNATIVE

During a PAC meeting on January 15, 2014, the PAC reviewed and evaluated the development alternatives to determine the most suitable long-term airside and landside development to be recommended to the Port of St. Helens as the "preferred alternative" for their review and approval. The preferred alternative was presented to the Port Commission on February 26, 2014. The Port Commission approved the preferred alternative concept, which has been depicted on the Airport Layout Plan (ALP) and presented in the Airport Plans Chapter.

As anticipated, the preferred alternative included elements from the various build alternatives. The following is a discussion of selected elements of the preferred alternative while **Exhibit 5F** provides a visual illustration of the same.

- **Airport Reference Code (ARC).** Given that the critical aircraft is expected to remain one of the B-II family, and due to the large magnitude of cost associated with relocating both Taxiways A and B to meet C-II standards, the PAC recommended that the ARC remains at B-II. However, all new development, especially on the east side should use C-II separation standards in order to protect for a future (beyond the planning period) ARC upgrade to C-II.
- **Runway Extension**. The PAC recommended a 900-foot runway extension to the south. Although the runway extension is not justified in the planning period, the PAC believes that its inclusion in the preferred alternative and ultimately on the Airport Layout Plan (ALP) will allow the Port to protect for such an extension should it be needed in the distant future.
- **Runway 15 Threshold/Runway Protection Zone (RPZ) Location**. The PAC recommended that Runway 15 threshold remain at its current location. This recommendation relates to the incompatible land use (roadways) within the RPZ. This issue was discussed at length during the PAC meeting and additional details relating to the discussion and associated FAA guidance are provided below in a separate section.
- **Development and Land Acquisition in NE Area.** The PAC recommended that the development of the northeast corner of the Airport be shown on the preferred alternative as it is shown on Alternative 3. This include the apron expansion to improve the circulation in and out of the FBO. The PAC also recommended the acquisition of the five parcels to the northeast, as shown on Alternative 3. The POSH explained that they do not intend to actively seek the acquisition of the properties shown but would like to document their interest in the properties were they to become available. The PAC recommended that these parcels be labeled as "Aviation Reserve". POSH staff indicated that they would

reach out to property owners prior to the preferred alternative appearing for a vote before the POSH's Council.

- **Sierra Pacific Property along Eastern Airport Property Boundary.** In regards to the Sierra Pacific property to the east, most PAC members delegated the decision to Sierra Pacific's representative Ed Freeman. Sierra Pacific indicated, through email as their representative was not present at the PAC meeting, that they do not support showing the property as future acquisition by the POSH. They would, however, support showing enough of the western edge of the property as acquisition to support a possible future upgrade to an ARC of C-II. The preferred alternative shows a small portion of Sierra Pacific property, adjacent to the Airport boundary, as future acquisition to support a future ARC upgrade.
- **Possible Parcel Trade.** The PAC recommends showing the property to the southeast of the runway as a possible trade for future property on the west side. Based on Sierra Pacific's plans to develop the east side of the Airport, the PAC believes that they will be interested in acquiring this property in exchange for some of their properties to the west of the runway, where most of the Port owned development lies.
- **West Side Development.** As for the west side of the Airport, the PAC included most of the items shown in Alternative 3 in their preferred alternative with few changes that include:
    - Moving the Group I Taxiway further to the south and providing a two way Taxiway in order to ensure proper circulation in and out of the new hangar development
    - Changing the designation of the area labeled on Alternative 3 as "Restaurant/Aviation Compatible" to "Aviation Related Commercial Development."

RPZ Discussion

The Interim Guidance on Land Uses within a Runway Protection Zone was issued in 2012. The guidance states that when a triggering event takes place, the Regional Office (RO) and Airport District Office (ADO) must work with the airport sponsor to identify and document a full range of alternatives that would:

- Avoid introducing the land use issue within the RPZ
- Minimize the impact of the land use in the RPZ (i.e., routing a new roadway through the controlled activity area, move farther away from the runway end, etc.)
- Mitigate risk to people and property on the ground (i.e., tunneling, depressing and/or protecting a roadway through the RPZ, implement operational measures to mitigate any risks, etc.)

Once the alternatives are identified, they must be coordinated with the National Airport Planning and Environmental Division and APP-400 (who will coordinate with the Airport Engineering Division, AAS-I OO).

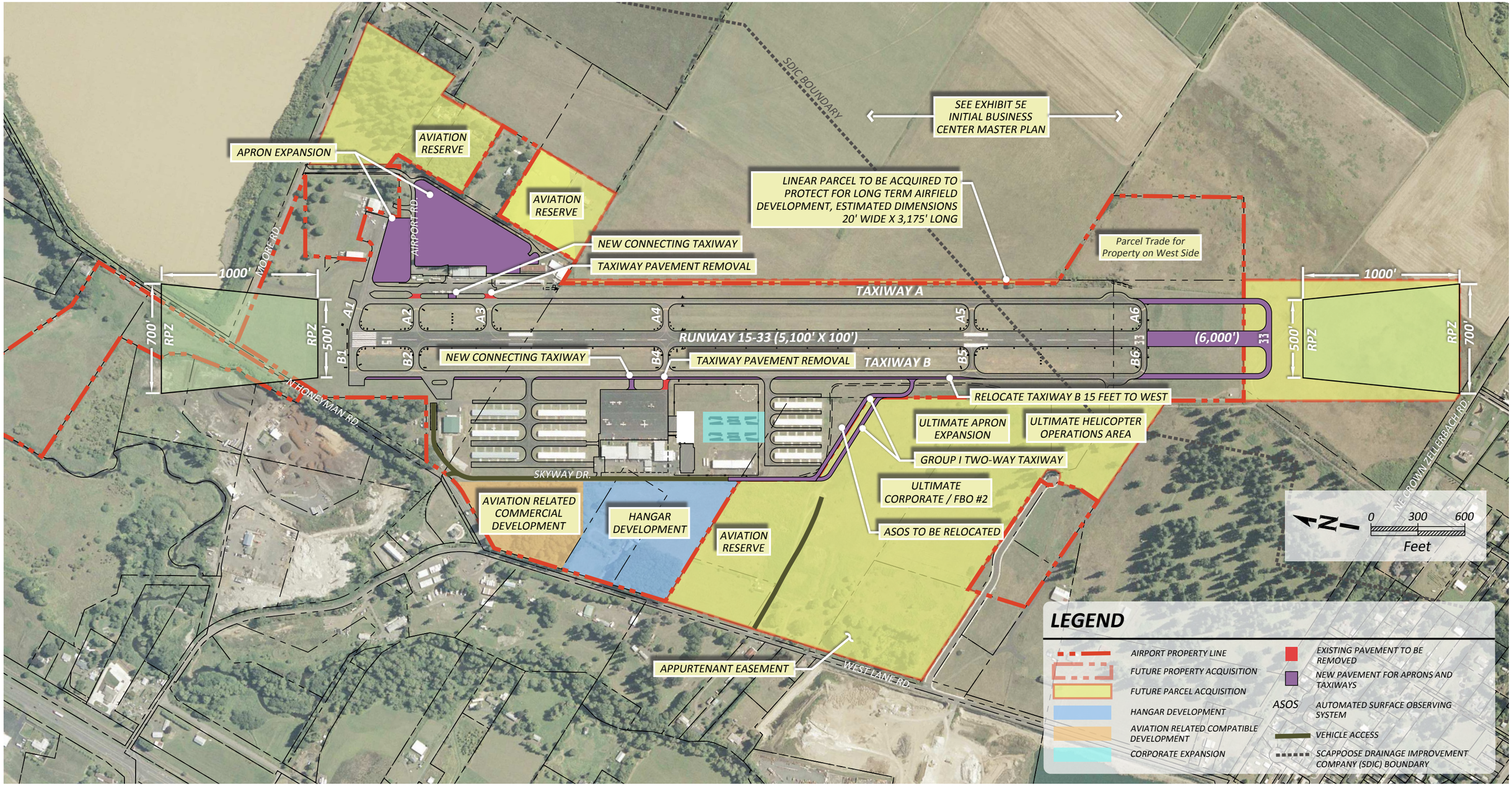
Further, a triggering event is defined as any incompatible land use that would enter the limits of the RPZ as a result of:

- An airfield project (e.g., runway extension, runway shift)
- A change in the critical design aircraft that increases the RPZ dimensions
- A new or revised instrument approach procedure that increases the RPZ dimensions
- A local development proposal in the RPZ (either new or reconfigured)

The guidance defines incompatible land uses in the RPZ that would require coordination with APP-400 as:

- Buildings and structures (Examples include, but are not limited to: residences, schools, churches, hospitals or other medical care facilities, commercial/industrial buildings, etc.)
- Recreational land use (Examples include, but are not limited to: golf courses, sports fields, amusement parks, other places of public assembly, etc.)
- Transportation facilities.
- Fuel storage facilities (above and below ground)
- Hazardous material storage (above and below ground)
- Wastewater treatment facilities
- Above-ground utility infrastructure (i.e. electrical substations), including any type of solar panel installations

During the PAC Meeting held on January 15, 2014, the PAC members discussed this RPZ land use guidance and what it potentially means with respect to the presence of N. Honeyman Road and Moore Road in the Runway 15 RPZ. The PAC recommended that due to the interim nature of the guidance and the fact that a triggering event is not anticipated in the short term, the preferred alternative not show the relocation of Runway 15 threshold to clear the roads out of the RPZ. Official FAA-published guidance on this issue and related land use guidance is expected to be released in 2014. PAC members support maintaining the Runway 15 threshold location today noting the loss of runway length as a major and unnecessary impact at this time. However, the PAC indicated that the alternatives presented could be referenced and reevaluated if and when a triggering event takes place or once final FAA guidance is published that requires the POSH address the RPZ issue. Therefore, the preferred alternative shows Runway 15 threshold remaining in its present location.



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SCAPPOOSE INDUSTRIAL AIRPARK

AIRPORT MASTER PLAN UPDATE

Preferred Alternative

EXHIBIT 5F

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Chapter Six COMPLIANCE REVIEW

As a recipient of Federal Airport Improvement Program (AIP) grant funds, Scappoose Industrial Airpark is contractually bound to various sponsor obligations typically known as "Grant Assurances". These Grant Assurances are included in the grant application package.

Although the FAA is continuously making an effort to educate airport sponsors in general of their obligations as grant recipients, much of the FAA's efforts with individual sponsors have been in reaction to violations that came to the FAA's attention and required correction.

The inclusion of this compliance review chapter in the Master Plan represents a proactive, or even preventive, effort to ensure that the Airport is in compliance with the Grant Assurances.

When administering the AIP, the FAA has implemented a simplified noncompliance process to withhold sponsor entitlement funds. The project grant application approval process, outlined in 49 U.S.C. § 47106. Subparagraph 47106(d), discusses withholding grant application approval and specifically calls out primary apportionment funds 47114(c) and supplemental apportionment for Alaska 47114(e) as requiring the opportunity for a hearing prior to withholding grant application approval due to a violation of grant assurances. The statute does not require a hearing to

withhold grant application approval for general aviation apportionment 47114(d); this includes 47114(d)(2) state apportionment and 47114(d)(3) non-primary apportionment. Non-primary apportionment are the funds commonly referred to as General Aviation Entitlements, i.e. $150,000 maximum per fiscal year per general aviation airport. Section (g)(2) of 49 U.S.C. § 47107 states that "The Secretary of Transportation may approve an application for a project grant only if the Secretary is satisfied that the requirements prescribed under paragraph (1)(A) of this subsection have been met." Subsection 1(A) says, "To ensure compliance with this section, the Secretary of Transportation shall prescribe requirements for sponsors that the Secretary considers necessary." The FAA can administratively determine that a sponsor is not meeting its grant assurances and withhold entitlement funds at general aviation airports.

This chapter examines existing as well as potential compliance issues and recommends remedial actions and timeframes for achieving compliance. The FAA Airport Sponsor Grant Assurances (as amended in April of 2012) and the FAA Airport Compliance Manual - Order 5190.6B –guides the compliance review and recommendations process.

GRANT ASSURANCES GUIDING PRINCIPLES

The FAA Airport Compliance Manual states that "the Airport Compliance Program is designed to protect the public interest in civil aviation. Grants and property conveyances are made in exchange for binding commitments (federal obligations) designed to ensure that the public interest in civil aviation will be served. The FAA bears the important responsibility of seeing that these commitments are met."

The inclusion of an airport in the FAA National Plan of Integrated Airport Systems (NPIAS) makes it eligible for the federal funds. That inclusion also means that the airport is part of, and is expected to serve a role in the larger national system. The grant assurances are put in place to ensure that the Federal involvement in an airport's development is guided by the principle that all airports included in the NPIAS contribute to an airport system that has the following attributes to meet the demand for air transportation:

- Airports should be safe and efficient, located at optimum sites, and developed and maintained to appropriate standards.
- Airports should be efficiently operated so that they are affordable to both users and Government. They must rely primarily on user fees and place minimal burden on the general revenues of the local, State, and Federal governments.
- Airports should be flexible and expandable, able to meet increased demand and able to accommodate new aircraft types.
- Airports should be permanent, with the assurance that they remain open for use over the long term.

- Airports should be compatible with the surrounding communities. They must maintain a balance between the needs of aviation and the requirements of residents in neighboring areas.
- Airports should be developed in concert with improvements to the air traffic control system and technological advancements.
- The airport system should support national objectives for defense, emergency readiness, and postal delivery.
- The airport system should be extensive, providing as many people as possible with convenient access to air transportation, typically by having most of the population within 20 miles of a NPIAS airport.
- The airport system should help air transportation contribute to a productive national economy and international competitiveness.

FAA Airport Compliance Manual - Order 5190.6B – not only addresses the types of commitments that grant receivers make and their application to airports but also provides the action required by FAA personnel to enforce these commitments.

AIRPORT SPONSOR ASSURANCES

AIP obligations or grant assurances relating to the use, operation, and maintenance of the airport remain in effect for the useful life of the facilities developed, equipment acquired, or project items installed in the facilities, not to exceed 20 years. Some assurances have no limit on the duration of terms; they remain in effect as long as the airport remains in operation. This is true for Grant Assurance 23, Exclusive Rights; Grant Assurance 25, Airport Revenues; and Grant Assurance 30, Civil Rights. In addition, under AIP grants, the duration of the terms, conditions, and assurances do not expire with respect to real property acquired with federal funds (land and appurtenances, when applicable) as covered by Grant Assurance 4, Good Title; Grant Assurance 31, Disposal of Land; and Grant Assurance 35, Relocation and Real Property Acquisition.

Thirty-nine (39) Grant Assurances are agreed to when accepting an AIP grant. This section will provide a brief description of each of these assurances along with an examination of the Port's compliance and/or ability to correct non-compliance issues.

1 – General Federal Requirements. The airport sponsor will comply with all applicable Federal laws, regulations, executive orders, policies, guidelines, and requirements as they relate to the application, acceptance, and use of Federal funds.

- It appears that the Port has, and will continue to comply with all applicable federal guidance to the best of its ability.

2 – Responsibility and Authority of the Sponsor. The grant applicant must have the legal authority to apply for, finance, and administer the grant.

- The Port, as acknowledged by the State of Oregon, is the local discretionary authority for the Airport.

3 – Sponsor Fund Availability. The Sponsor must have sufficient funds to match their portion of the AIP grant.

- The Port has historically complied with this assurance. Additionally, the Capital Improvement Plan (CIP) developed as part of this master plan identifies funding sources for the local match prior to applying for federal assistance.

4 – Good Title. The Sponsor must hold good title to the Airport, or to the site of proposed improvements.

- Exhibit A (included in the previous Master Plan) shows that the Port owns the entire Airport property. If any future developments or projects exceed the Airport's boundary, the Port will secure the land via fee acquisition or avigation easement. Additionally, a Property Map has been prepared as part of this Master Plan to reflect current property and proposed future acquisitions.

5 – Preserving Rights and Powers. The Airport sponsor will not take or permit any action that would deprive it of the rights and powers necessary to perform any of the grant assurances, nor will it sell, lease, encumber, or transfer any part of its title or interests in the Airport property.

- An important issue relating to this grant assurance is the granting of Through-the-Fence (TTF) leases. TTF activities allow access to airport facilities from off-airport users. Through-the-Fence Agreements can be divided to two categories, commercial Through-the-Fence (CTTF) and Residential Through-the-Fence (RTTF) agreements.

  The Airport does not have any existing RTTF agreements. The FAA has historically discouraged these agreements and in March of 2011, amended this grant assurance to prohibit new RTTF agreements and issued an interim policy to address existing RTTF at AIP-funded airports. However, Section 136 of the FAA Modernization and Reform Act of 2012, which was signed into a law in February of 2012, states that "a sponsor of a general aviation airport **shall not** be considered to be in violation of this subtitle, or to be in violation of a grant assurance made under this section or under any other provision of law as a condition for the receipt of Federal financial assistance for airport development, solely because the sponsor enters into an agreement that grants to a person that owns residential real property adjacent to or near the airport access to the airfield of the airport for the following:

A) Aircraft of the person.
B) Aircraft authorized by the person."

In order to implement the new law, the FAA issued Compliance Guidance Letter 2013-01 – FAA Review of Existing and Proposed Residential Through-the-Fence Access Agreements. The guidance provides important information on the lease agreements content and the approval process that the FAA requires.

Sierra Pacific has potential future plans to build an Airpark on their property and have indicated their interest in entering into a Residential Through-the-Fence agreement with the Port. Prior to entering into any agreement, the Port will review the information available from the FAA through their newly created "Residential Through-the-Fence Access Toolkit". The toolkit, which contains access agreement review sheets, recommendations for sponsors, official interpretations of the law, and sample agreements, is designed to help sponsors and applicants create successful, legal agreements with minimal agency interference. Additionally, any new RTTF agreements will be submitted to the FAA for review and approval prior to their finalization, in compliance with this grant assurance. Appendix E contains sample documents from the FAA Residential Through-the-Fence Toolkit.

The FAA has not changed its policy on commercial through-the-fence (CTTF) access agreements. Specifically, the FAA is not in support of any CTTF agreements that would compete with on-airport business. The FAA does, however, provide specific examples of CTTF agreements that would not compete with an on-airport business, such as an industrial park or manufacturing facilities.

A review of the existing through-the-fence commercial agreements revealed that these agreements place no contractual or legal encumbrances or conditions upon the airport property, and therefore they do not violate this grant assurance. Additionally, these agreements are consistent with the FAA's policies on commercial through-the-fence activities and ensure the off-airport businesses do not result in unjust economic discrimination for on-airport aeronautical service providers. The commercial through-the-fence lease holders are providing services that do not compete with existing on-airport businesses.

6 – Consistency with Local Plans. The proposed project must be reasonably consistent with Local, County, and State plans, to include the area surrounding the Airport.

- It appears that past projects undertaken at the Airport were consistent with Local, Port, and State plans. Additionally, this Master Plan, which will ultimately be incorporated into

the Port's Comprehensive Plan, recommends that all Oregon Department of Aviation land use regulations be adopted. It is anticipated that all future projects will comply with this assurance.

7 - Consideration of Local Interests. The sponsor will give fair consideration to the local community's interests.

- The environmental review, completed in Chapter 1, did not identify any known public controversy at the Airport. This Master Plan has been conducted with the assistance of a Planning Advisory Committee, with all meetings open to the public. Additionally, a series of Public meetings and open houses were held to allow for public input and participation. Future projects will undergo public involvement, consistent with the project's scope.

8 – Consultation with Users. Consultation with affected parties using the Airport must be conducted prior to, and during, any proposed project.

- There are no indications that the Port has not consulted with affected parties during prior projects. This Master Plan included a user survey and Airport users were represented on the Planning Advisory Committee. The Port will coordinate with affected parties, as necessary, consistent with the nature of the project.

9 – Public Hearing. For major projects, the Airport sponsor must give the community an opportunity for a public hearing to consider economic, social, and environmental effects of the proposed project.

- The Port will coordinate with the FAA to determine what qualifies as a major project. If necessary, the Port will publish in its newspaper of record the availability of public hearing, if requested by a member of the public. This Master Plan process includes five public open houses, all of which were advertised in two different newspapers and on the Port's website.

10 – Air and Water Quality Standards. For major construction projects, the sponsor must comply with applicable air and water quality standards to the satisfaction of concerned agencies.

- Consistent with the recommendations in Chapter 4, the Port should, as it has in the past, coordinate with applicable agencies during project design to determine permit requirements, if any.

11 - Pavement Preventative Maintenance. The sponsor must implement an effective airport pavement maintenance-management program for the useful life of any pavement construction with AIP assistance.

- The Oregon Department of Aviation implemented a Pavement Maintenance and Evaluation Program in 2000 that satisfies FAA's requirements for this grant assurance. The Port should continue its involvement in the Program.

12 - Terminal Development Prerequisites. If the sponsor were to develop a public-use terminal, it must certify that all safety and access equipment required by rule or regulation is provided to all passengers.

- If a terminal were to be developed, and when justified by demand, the plans and specifications prepared by the Port and its engineer – and approved by the FAA – would ensure all equipment needs are met.

13 - Accounting System, Audit, and Record Keeping Requirements. The Port must keep all project accounts and records relative to the project in accordance with the Single Audit Act of 1984. Additionally, the Port must make all records available for the purpose of audit and examination.

- Currently, it appears the Port's recordkeeping satisfies FAA's requirements. However, the Port should periodically evaluate their accounting system to ensure future compliance. Project documentation should be readily accessible and include such items as fund transfers, income received, expenditures, and any other information pertinent to the project.

14 – Minimum Wage Rates. For all contracts in excess of $2,000 that involve labor, the sponsor shall establish minimum wage rates in accordance with the Davis-Bacon Act (40 U.S.C. 276a-276a-5).

- The Port has, and will continue to, establish minimum rates of wages consistent with the Davis-Bacon Act for all federally-assisted contracts meeting this requirement.

15 – Veteran's Preference. Contracts for work involving AIP grants must ensure that preference is given to available and qualified veterans.

- The Port has indicated that all AIP funded projects do provide preference for qualified veterans. It is recommended that all future project plans and specifications include a clause regarding veteran's preference.

16 – Conformity to Plans and Specifications. The sponsor will execute the AIP projects per the plans, specifications, and schedule approved by the FAA. Any modifications to the project must obtain the FAA's approval.

- Regular contact with the FAA should be initiated by the Port and the Port's engineer to avoid any miscommunications or deviations from the approved program. Onsite construction inspection should help lessen the possibility of work being performed

inconsistent with the project's plans and specifications. It does not appear that any past projects have violated this requirement.

17 - Construction Inspection and Approval. Competent technical supervision must be provided by the sponsor throughout the construction project to assure the work conforms to the plans, specifications, and schedule approved by FAA.

- All future projects should be overseen by qualified construction inspection personnel. It does not appear that any past projects have violated this requirement.

18 – Planning Projects. During planning projects, the sponsor must execute the project as approved in the scope of work, while making the reports and documents available to the public.

- As it has in this Master Plan process, the Port has developed plans in an open manner with input from the community. The Port should continue this process for all future planning projects.

19 - Operation and Maintenance. The Airport and all facilities must be operated at all times in a safe and serviceable condition and in accordance with minimum standards set by the sponsor. Any temporary closure for non-aeronautical purposes must be approved by the FAA. The sponsor must promptly mark and/or light hazards and notify airmen of any condition affecting aeronautical use of the Airport.

- The Port meets the criteria of this grant assurance. Port Resolution 2009 – 12 establishes minimum standards that govern the activities of Airpark tenants in accordance with Advisory Circular (AC) 150/5190-7. The minimum standards were last amended in July of 2011. The Port will continue to revise and update the minimum standards for the Scappoose Industrial Airpark, as necessary, to ensure continuous compliance with this grant assurance.

20 – Hazard Removal and Mitigation. The sponsor must take appropriate action to assure the Airport's airspace is adequately cleared and protected.

- The Port has recently completed various tree removal projects in order to ensure that the Airport's airspace is cleared. The Port is committed to removing any remaining obstructions identified in this Master Plan.

21 - Compatible Land Use. To the extent reasonable, the sponsor shall include the adoption of zoning laws to restrict the use of land adjacent to or in the immediate vicinity of the Airport to activities and purposes compatible with normal airport operations.

- The City of Scappoose and Columbia County have defined an Airport Overlay Zone to ensure that land use and zoning in the Airport's surroundings are compatible with the Airport and its operations.

22 - Economic Nondiscrimination. The sponsor will make the Airport available as an airport for public use on reasonable terms and without unjust discrimination to all types, kinds, and classes of aeronautical activities. Any agreement the sponsor enters into with a third party must outline and enforce provisions that 1) services will not be unjustly discriminatory; 2) charges will be reasonable and just; 3) each FBO shall be subject to the same rates and charges; and 4) the sponsor will not grant any right which operates to prevent any person, firm, or corporation operating aircraft from performing any services that it may choose to perform.

- A review of the existing leases and agreements revealed that they do make the Airpark available to all types, kinds and classes of aeronautical activities. Additionally, these leases and agreements do not grant any exclusive rights that would prevent other users from performing any services (including, but not limited to, maintenance, repair, and fueling) that they may choose to perform.

23 – Exclusive Rights. The sponsor must not permit exclusive right for the use of the Airport by any person providing aeronautical services to the public. Services by a single FBO are not considered an exclusive right if it would be unreasonably costly or impractical for more than one FBO to provide the services and if allowing more than one FBO would require the reduction of the first FBO's lease area.

- A review of the Port's lease agreements did not reveal that exclusive rights were granted to any tenants and/or Through-The-Fence (TTF) operators. There is no indication that the Airport has in the past denied any lease requests on the basis of the request competing with an existing lease holder's business. The Port will continue to review all requests for the provision of aeronautical services at the Airport to ensure a competitive airport environment and safe and efficient operations.

24 – Fee and Rental Structure. The fee and rental structure for Airport facilities and services must be developed and maintained by the sponsor with the goal of helping the Airport become financially self-sustaining.

- The Port is continuously updating its fee and rental structure with the goal of becoming financially self-sustaining. That said, higher fees might not always lead to higher revenue since the lower fees are the reason many aircraft owners choose to be based at an Airport. The fee structure should be based on a market study that looks at keeping the attractiveness of the Airport while generating the most possible revenue. The Port, in annually reviewing its fee structure and collecting fee data from other state airports, is in compliance with this assurance. Additionally, certain lease and agreement holders are providing services to the Airport at no charge. For example, the FBO handles issuing

NOTAMs for the Airport, notifies tenants of potential closures, provides regular airfield inspections for foreign object debris (FOD), and provides a minimum level of security of the facilities. It is recommended that services provided by any lease or agreement holders be documented by the Port as they represent an additional fee. It is also recommended that such services be included in and documented as part of future lease or agreement renewals.

25 – Airport Revenues. All revenues generated by the Airport and any local taxes on aviation fuel will be expended by the Airport for the capital or operating costs of the Airport, the local airport system, and other facilities owned by the sponsor which are directly and substantially related to the actual air transportation of passengers or property.

- The Port is in compliance with this grant assurance. All revenue generated by the airport is used for the capital and/or operating costs of the Airport.

26 – Reports and Inspections. The sponsor will submit annual financial and operations reports to the FAA, and make the reports available to the public. All Airport records for development projects must be available to the FAA upon request.

- The Port has complied with all requests by the FAA for data and records pertaining to the Airport. These reports are also available to the public, as part of the Port's records.

27 – Use by Government Aircraft. The sponsor shall make available all of the facilities of the Airport developed with Federal financial assistance and all those usable for landing and takeoff of aircraft to the United States for use by Government aircraft at all times without charge. However, if the use by Government aircraft is substantial, charge may be made for a reasonable share, proportional to such use, for the cost of operating and maintaining the facilities used.

- The Port has, and will continue to, make its facilities available for government use as appropriate and in compliance with this grant assurance.

28 – Land for Federal Facilities. The sponsor shall furnish real estate, without cost to the Federal Government, for use in connection with any air navigation, weather reporting, or communication activities.

- The Airport has complied with this grant assurance. An ASOS operated by the National Weather Service, in corporation with the FAA and the Department of Defense is located on Airport property.

29 – Airport Layout Plan. The Airport Layout Plan will be kept up-to-date at all times.

- The ALP was last updated and approved as part of the previous Airport Master Plan in 2004. This Master Plan also updated the ALP. Additionally, the ALP will continue to be updated in the future as needed.

  It is important to note that compliance with the new FAA guidance on through-the-fence agreements requires that the ALP be updated when the Airport enters into such an agreement. The updated ALP must show all access points provided in the said agreement.

30 – Civil Rights. For the period the sponsor retains ownership of the Airport property it will assure that no person shall, on the grounds of race, creed, color, national origin, sex, age, or handicap be excluded from participating in any activity conducted with or benefiting from funds received from the grant.

- The Port has, and continues to, comply with this assurance.

31 – Disposal of Land. When land purchased under a grant for airport development purposes is no longer needed for airport purposes, disposal of such land should be done at fair market value or the land must be made available to the US Transportation Secretary. Land is considered to be needed for airport purposes if it is needed for aeronautical purposes (such as the RPZ) or serve as a noise buffer, and the revenue from the interim uses of such land contributes to the financial self-sufficiency of the Airport. Disposition of the land must retain the rights necessary to ensure the land will only be used for airport-compatible purposes.

- This Master Plan identified additional land for future acquisition and airport development. A smaller portion of airport-owned property is proposed to be traded for a portion of the future acquisition, which better serves the POSH's airport development plans. Since the Airport will increase its total airport property acreage with the trade and this transaction will be coordinated with the FAA, compliance with this grant assurance will be maintained.

32 – Engineering and Design Services. The sponsor will award engineering, planning, and design contracts based on qualifications, in the same manner as a contract for architectural and engineering services under Title IX.

- The Port has, and will continue to, secure professional services according to the guidance of Title IX.

33 – Foreign Market Restrictions. The sponsor shall not allow grant funds to finance any project that uses any product or service of a foreign country listed by the US Trade Representative as denying fair and equitable market opportunities.

- The Port has not knowingly financed any product or services from a restricted country of origin. Materials and labor for any proposed project are readily available in the United States, so there should be no issues concerning securing them from non-listed countries.

34 – Policies, Standards and Specifications. The sponsor shall carry out the project in accordance with the policies, standards, and specification approved by the Secretary of Transportation.

- The Port has, and will continue to, perform all projects in accordance with U.S. Department of Transportation policies, standards, and specifications.

35 – Relocation and Real Property Acquisition. If real property is to be acquired, the sponsor will reimburse property owners – to the extent practicable – for necessary expenses, including relocation assistance or comparable replacement dwelling in accordance with FAA regulations.

- Prior to the acquisition of any property as recommended by this Master Plan, whether it includes runway protection zones or land for development and expansion, the Port will provide all the necessary reimbursements to property owners in accordance with FAA regulations.

36 – Access by Intercity Buses. Intercity buses, if applicable, will have access to the Airport.

- No bus service is currently available at the Airport and there does not appear to be any plans for future bus service.

37 – Disadvantaged Business Enterprise (DBE). No discrimination on the basis of race, color, national origin, or sex will be tolerated in the award and performance of any FAA-assisted contract or in the administration of the sponsor's DBE Program.

- A review of past federally funded contracts entered into by the Port indicates that all Port projects include a DBE clause and are in accordance with 49 CFR Part 26.

38 – Hangar Construction. If a third party constructs a hangar at their own expense, the sponsor will grant the third party a long-term lease subject to such terms and condition on the hangar as the sponsor may impose.

- Hangar lease agreements entered into by the Port are consistent with FAA guidance and this grant assurance. It is recommended that the Port continues to periodically review its lease agreements to ensure continuous compliance.

39 – Competitive Access. This assurance only applies to medium or large hub airports.

- This assurance does not apply to Scappoose Industrial Airpark.

AIRPORT COMPLIANCE PROGRAM

The Airport Compliance Program aims to ensure that the nation has a system of safe and properly maintained public use airports that operate according to the airport owners' federal obligations. The program is designed to safeguard the public's investment in civil aviation.

The Airport Compliance Program is not designed to control or direct operations at an airport, but to protect the federal investment by monitoring airport sponsors' compliance with the commitments they made to the federal government. More specifically, the program is designed to:

- Educate airport sponsors
- Promote dispute resolution through an informal process using CFR 14 Part 13.1 and/or an alternative dispute resolution (ADR).
- Eliminate duplication by distinguishing between the functions of local, regional, and national FAA offices.
- Speed the decision-making process.
- Enforce agreements when necessary.

The guidelines of the Airport Compliance Program are found in FAA Order 5190.6B, Airport Compliance Requirements Manual. Order 5190.6B offers more details than what is found in the AIP grant application. The Manual must be consulted to develop corrective action with regard to any grant assurance deficiencies. The topics covered in the Airport Compliance Manual include:

- Scope and Authority of the FAA
- Compliance Program
- Federal Obligations from Property Conveyances
- Federal Grant Obligations and Responsibilities
- Complaint Resolution
- Rights and Powers and Good Title
- Airport Operations
- Exclusive Rights
- Unjust Discrimination between Aeronautical Users
- Reasonable Commercial Minimum Standards
- Self-Service
- Review of Aeronautical Lease Agreements
- Airport Noise and Access Restrictions
- Restrictions Based on Safety and Efficiency Procedures and Organization
- Permitted and Prohibited Uses of Airport Revenue
- Resolution of Unlawful Revenue Diversion
- Self-sustainability
- Airport Rates and Charges
- Airport Financial Reports

- Compatible Land Use and Airspace Protection
- Land Use Compliance Inspection
- Releases from Federal Obligations
- Reversions of Airport Property
- Appendices

As previously mentioned, the Airport Compliance Requirements Manual will guide the development of remedial actions addressing the Port's compliance with the FAA grant assurances.

STATE ASSURANCES

Like the FAA, the Oregon Department of Aviation (ODA) has sponsor obligations that are associated with the receipt of state funding. However, the ODA does not maintain an official Compliance Program.

State funding is available through various programs that include:

- ConnectOregon (currently in its fifth version)
- Pavement Maintenance Program (PMP)
- Pavement Evaluation Program (PEP)

The state's sponsor obligations include:

- Airport sponsor agrees to keep the airport open for public use for a minimum of 20 years from the date of the funding agreement.
- Airport sponsor may not use the funds to rehabilitate or construct areas that are private or exclusive use areas.
- Airport sponsor shall comply with all federal, state, and local laws, regulations, executive orders and ordinances applicable to the work under the agreement.
- All employers, including airport sponsor, that employ subject workers who work under the funded contract in the State of Oregon shall comply with ORS 656.017 and provide the required Workers' Compensation coverage, unless such employers are exempt under 656.126.
- Airport Sponsor must certify and represent that the individual(s) signing the Agreement has been authorized to enter into and execute the Agreement on behalf of Airport Sponsor, under the direction or approval of its governing body, commission, board, officers, members or representatives, and to legally bind Airport Sponsor.
- Airport Sponsor acknowledges and agrees that State, the Oregon Secretary of State's Office, the federal government, and their duly authorized representatives shall have access to the books, documents, papers, and records of Airport Sponsor which are directly pertinent to the specific Agreement for the purpose of making audit, examination, excerpts, and transcripts for a period of six (6) years after final payment (or completion

of Project -- if applicable.) Copies of applicable records shall be made available upon request.

In addition to the above sponsor obligations, there are several state obligations that are project specific. For example, state-funded pavement maintenance projects require that the airport sponsor establishes and maintains a documented pavement maintenance program on a three-year inspection cycle in accordance with the State pavement inspection cycle.

As clearly evident in the State sponsor obligations listed above, the intent of the state requirements is similar to that of the FAA grant assurances.

SUMMARY, RECOMMENDATIONS AND BEST MANNAGEMENT PRACTICES

Based on the review presented above, no existing compliance issues were identified. It is important that the Port continues to communicate with the FAA and ODA in order to ensure the continuous compliance with Federal and State assurances.

Additionally, a number of best management practices are presented below. These practices are aimed at providing a preemptive approach to avoid potential future issues regarding certain grant assurances. It should be reiterated that the Port is currently in compliance with these assurances. That said, topics addressed in the best management practices include those that may pose a future compliance issue for the Port as well as those that have been identified to traditionally cause noncompliance at other airports around the country.

Sponsor Fund Availability: This master plan identifies a capital improvement plan (CIP) that will propose a feasible and attainable action plan for development at the Airport. Along with the estimated cost for the projects, the CIP projects the Port's share of the improvement costs. The Port should use this to budget for anticipated projects. Additionally, the CIP should be updated regularly based on development demand.

Accounting System, Audit, and Record Keeping Requirements: Although there are no existing concerns regarding the Port's accounting system, it is recommended the Port periodically review their accounting practices. This proactive approach will ensure that all needs of the Port and FAA are met.

Hazard Removal and Mitigation: According to existing records, there are no current obstructions to the Airport's airspace. It is recommended that Port work aggressively towards removing new obstructions, if any, identified in this master plan.

Disadvantaged Business Enterprises. A current copy of the Port's DBE Program must be on file with the FAA Office of Civil Rights at all times. The Port should update their DBE Program, as well as develop DBE goals for upcoming projects involving federal funding.

Fee and Rental Structure: The Port must continually update its fee and rental structure with the goal of generating enough revenue to make the airport self-sufficient in funding day to day operational needs. The Port should annually compare the Airport's fees and rental structure with those offered at other airports in the region and evaluate market value for similar services and fees. Additionally, all fees, including those in the form of services, must be documented and included in the lease documents.

Residential Through-The-Fence (RTTF) Agreements: Any new RTTF agreement must comply with the FAA guidance at the time of the agreement. It is recommended that the Port consults the FAA's "Residential Through-the-Fence Access Toolkit" for guidance in developing RTTF agreements. Any new RTTF agreements would trigger the need to update the Airport's ALP to show the TTF access point.

Commercial Through-The-Fence (CTTF) Agreements: As previously stated, the FAA does not support any CTTF agreements that would compete with on-airport business. It is important that that the Port ensure renewal of existing CTTF agreements does not grant exclusive rights that would preclude an on-airport business from providing the same services. If and when an on-airport business provides the same services as those provided by entities with CTTF agreements, the Port must ensure that the CTTF agreements do not provide an economical advantage to the off-airport agreement holder. Finally, the evaluation of new CTTF agreements must ensure that the services they provide are not provided by on-airport businesses.

Educational Program: Using this document and other documents available from the FAA and ODA, the Port is encouraged to develop an educational program to educate Port Commissioners, Airport management staff, legal counsel, FBO, Tenants, and the general public about the sponsor obligations and the grant assurances. The Port is also encouraged to seek the FAA's help and guidance as it relates to compliance questions and/or concerns.

Chapter Seven ALP DRAWINGS

Scappoose Industrial Airpark Master Plan Update

This chapter describes the Airport Layout Plan (ALP) set of drawings prepared for the Master Plan Update. The ALP set is the product of the findings from the earlier master planning study elements—inventory, forecasts, facility requirements, and preferred alternative selection. Several drawings are included in the ALP to graphically depict the existing facilities and the proposed future airside and landside facility layouts including their associated surfaces for protection.

Generally, the future airport layout for Scappoose encompasses runway and taxiway improvements, additional aircraft parking apron areas, expanded hangar development, proposed through-the-fence access points for future off-airport development, and property acquisition—all elements of the Port of St. Helens' (POSH) preferred alternative from Chapter 5.

The ALP set was prepared in accordance with the latest ALP checklist included in ARP SOP No. 20, dated October 1, 2013. A copy of the completed checklist is submitted to the FAA with the ALP for their reference and review process.

The ALP drawings for the Scappoose Industrial Airpark (Airport) include the following, which are submitted to the FAA as full-size 22" x 34" drawings. A reduced-size 11"x17" set of these drawings is included at the end of the chapter:

- Title Sheet
- Airport Layout Plan Drawing
- Data Sheet
- Part 77 Airspace Plan
- Inner Portion of Approach Surface
- Departure Surface
- Terminal Area Plan
- Land Use Plan and Airport Noise Contours Map
- Property Map

Digital files of the previous ALP set, an updated aerial photo, and other available data sources were used to update the drawings for this Master Plan. The following sections provide a narrative description of the drawings.

TITLE SHEET

In addition to the airport name, airport improvement program (AIP) project/grant number, and date, the title sheet includes an index of the various sheets contained the ALP drawing set. A location map, vicinity map, and the wind rose and wind coverage table for Runway 15-33 are also included.

AIRPORT LAYOUT DRAWING

The Airport Layout Drawing is the most important drawing in the ALP set. Complete with a detailed plan view drawing of the existing physical features and proposed future airside and landside facilities, this drawing provides the FAA with a great deal of technical data about the Airport all on one sheet. This technical data is noted in data tables and/or on the illustrative layout of the Airport. The Airport Data table includes information such as the airport elevation, airport coordinates, mean maximum temperature of the hottest month, and Airport Reference Code (representing the family of aircraft served). The majority of the airfield data is included in the Runway Data Table with information such as the runway dimensions, critical/ design aircraft, pavement type and design strength, runway dimensions, lighting, instrument approach aids, and dimensions of design surfaces requiring protection. A legend is included on the ALP drawing to call out these various surfaces shown on the graphic along with other drawing features such as property boundaries, buildings, pavements, and other facilities. For Scappoose, several notes are

listed on the ALP drawing to provide details regarding data sources and to clarify specific features shown on the drawing. A building/facilities table is included to numerically list the various facilities, which is tied to a number depicted on the drawing to specify each facility's location.

Also, the ALP includes a phasing plan for the future buildings at the airport. Stage 1, 2, and 3 building construction is identified and color-coded as green, pink and blue, respectively.

PART 77 AIRPSACE PLAN

The Airspace Plan is a plan view of the airport's airspace footprint, which is an elliptical area for Scappoose as it structured around a single runway configuration. A USGS quad map serves as the base map with an overlay of the airspace surfaces. Airspace surfaces depicted on this plan view drawing include the primary surface, approach surface, transitional surface, horizontal surface, and conical surface, described as follows.

Primary Surface. The primary surface is rectangular, centered on the runway, extends 200 feet beyond each end of the runway, and has a width that varies according to airport-specific criteria. The elevation of the primary surface corresponds to the elevation of the nearest point of the runway centerline. The width of the primary surface of Runway 15-33 is 500 feet.

Approach Surface. The approach surface is centered on the extended runway centerline, starts at the end of the primary surface (200 feet beyond each end of the runway), and has a width equal to that of the primary surface. Approach surfaces slope upward and outward from the runway ends.

For Scappoose, the existing and planned future approach types are the same—non-precision approach to Runways 15 with visibility minimums as low as 1 mile, and a basic visual approach to Runway 33. However, Runway 33's proposed 900-foot extension will shift the approach surface to the south by 900 feet as well. The Runway 33 approach surface has an inner width of 500 feet extending for a horizontal distance of 5,000 feet to an outer width of 1,500 feet at a slope of 20:1. Runway 15 has an approach surface inner width of 500 feet extending for a horizontal distance of 10,000 feet to an outer width of 3,500 feet at a slope of 34:1.

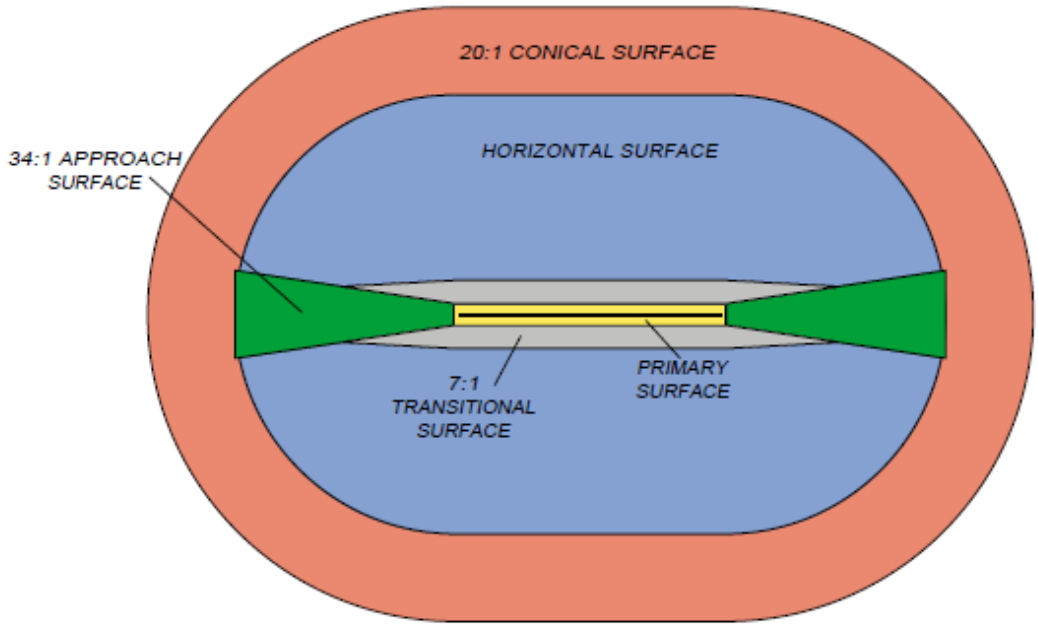
Transitional Surface. The transitional surface is a sloping 7:1 surface that extends outward and upward at right angles to the runway centerline from the sides of the primary surface and the approach surfaces.

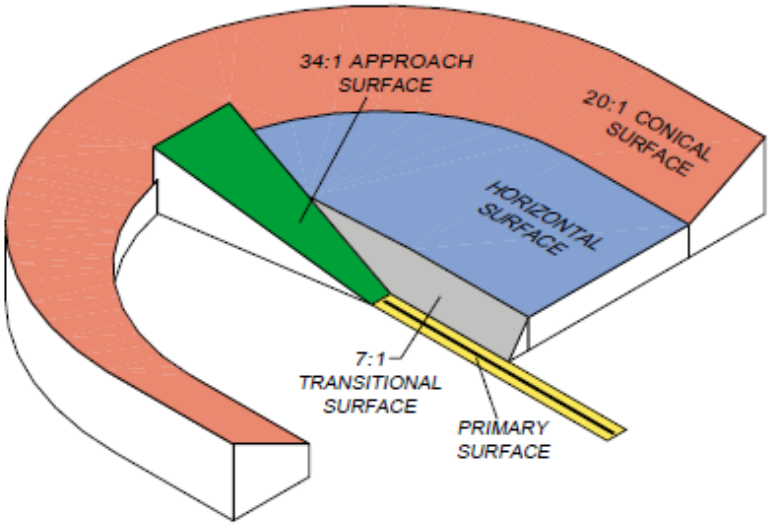
Horizontal Surface. The horizontal surface is a flat, elliptical surface at an elevation 150 feet above the established airport elevation. The extent of the horizontal surface is determined by swinging arcs of a 10,000-foot radius from the center of each end of the primary surface.

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

Exhibit 7A is a graphic depiction of these FAR Part 77 surfaces. To the extent possible, these airspace surfaces should be protected from obstructions to ensure the safe and efficient use of airspace. Part 77 allows the FAA through airspace reviews to determine if an existing or proposed obstruction is hazardous to air navigation.

Exhibit 7A. **FAR Part 77 Imaginary Surfaces – Non-precision approach**





INNER PORTION OF APPROACH SURFACE DRAWING

The inner portion of the approach surface provides a close-in look at the physical features near the runway ends in a plan view and a profile view. The runway centerline profile with elevations is depicted to easily identify possible obstructions so the FAA may determine whether an obstruction represents a hazard requiring action. Actions to mitigate such hazards might include the installation of obstruction lighting, displacing thresholds, or adjusting the instrument approach minimums.

DEPARTURE SURFACE DRAWING

For runways supporting instrument operations, a separate drawing depicting the departure surface is prepared. A clear departure surface, which is a 40:1 slope that begins at the departure end, allows pilots to follow standard departure procedures. Departure procedures may need to be adjusted to remedy obstructions in the 40:1 slope, which are common. The departure surface extends out a distance of 10,200 feet. For Scappoose, departure procedures for both runway ends are presently published to assist pilots in avoiding obstacles during the climb to the minimum enroute altitude. Obstacles identified in the departure procedures include trees at both ends.

TERMINAL AREA PLAN

The Terminal Area Plan (TAP) provides an enlarged view of significant development areas that typically include facilities such as the terminal/FBO area(s), auto parking, roadway access, and hangar and apron areas. The TAP also includes a building/facilities with estimated top elevations of buildings. This large-scale drawing offers space to provide details such as additional dimensions and facility notes and labels.

LAND USE PLAN AND NOISE CONTOURS MAP

Two similar drawings are prepared for the Land Use Plan and Noise Contours Map for Scappoose. The base map is the same in both drawings. However, the Land Use plan provides area land use information with an overlay of the near-term (2017) noise contours. The Noise Contours Map includes an overlay of two sets of noise contours -- the near-term noise contours shown on the Land Use Plan as well as the base year (2012) noise contours. Both sets of noise contours are depicted on one sheet for comparison.

Aircraft noise impacts were assessed using noise exposure contours produced by the FAA Integrated Noise Model (INM). The INM was developed for evaluating aircraft noise impacts in the vicinity of airports and has been the FAA's standard tool since 1978 for determining the

predicted noise impact in the vicinity of airports. The distribution of the noise pattern on each map calculated by the INM is a function of the number of aircraft operations, the types of aircraft flown, the time of day of the operation, how frequently each runway is used for arrivals and departures, and the routes of flight used to and from the runway. Substantial variations in any one of these factors may, when extended over a long period of time, cause changes to the shown annual noise pattern. The noise analysis study was developed using INM v7.D.

The noise exposure pattern at the airport is presented in terms of the average Day-Night Sound Level (DNL). The DNL measure is the annual one-second average of the total aircraft noise energy that occurs at a location. With DNL, the loudness of nighttime (10:00 p.m. to 6:59 a.m.) noise events are increased by ten decibels (db) to reflect the greater sensitivity to noise at night. The Noise Exposure Maps (NEMs) display contour lines that connect points of equal DNL exposure at 55, 60, 65, 70, and 75 dBA.

The FAA has adopted land use compatibility guidelines for preparing noise studies. These guidelines are presented in **Table 7A** below. As noted in Table 7A, a DNL below 65 dB is considered to be compatible with all land uses. In comparison, noise levels between DNL 65 and 75 are considered incompatible with residential areas and schools, but compatible with other activities. Within the DNL 65 to 75 dB range, homes and schools could be insulated to achieve an outdoor to indoor Noise Level Reduction (NLR) of at least 25 dB. However, in areas with a DNL over 75, residential land use is considered incompatible and relocation of such use is recommended. DNL levels over 75 are also considered incompatible with hospitals, places of worship, and recreational activities.

Although a DNL below 65 is considered compatible with all land uses, this threshold does not imply public acceptance. The number of people who are annoyed by aircraft noise in a specific area varies. The level of annoyance depends on the time of day, the time of year, the activities of the people, the type and age of the dwellings occupied by those people, and in some cases, the actual visual sighting of aircraft. Some people are more perceptive and sensitive to sound. Thus, there is no “universally acceptable” minimum DNL.

Furthermore, as DNL is an average noise level, it does not account for the peak noise level experienced at any giving location. A location within a DNL of 65 dB may have a peak noise level of LAMAX 90-100 dB during a flyover by the noisiest aircraft types, and 70-80 dB from common small aircraft. FAA requires the use of average noise levels in noise studies, as only average noise levels can be directly compared at all locations; peak noise is highly variable.

Table 7A. FAA Land Use Compatibility with DNL Guidelines

Land Use	DNL Levels (in dB)			
	<65	65-70	70-75	75-80
RESIDENTIAL				
Residential, Other than Mobile Homes	Y	N[1]	N[1]	N
Mobile Home Parks	Y	N	N	N
Transient Lodgings	Y	N[1]	N[1]	N[1]
PUBLIC USE				
Schools	Y	N[1]	N[1]	N
Hospitals, & Nursing Homes	Y	25	30	N
Churches, Auditoriums & Concert Halls	Y	25	30	N
Government Services	Y	Y	25	30
Transportation	Y	Y	Y[2]	Y[3]
Parking	Y	Y	Y[2]	Y[3]
COMMERCIAL USE				
Offices, Business & Professional	Y	Y	25	30
Wholesale & Retail-Building Materials, Hardware & Farm Equipment	Y	Y	Y[2]	Y[3]
Retail Trade-General	Y	Y	25	30
Utilities	Y	Y	Y[2]	Y[3]
Communication	Y	Y	25	30
MANUFACTURING & PRODUCTION				
Manufacturing-General	Y	Y	Y[2]	Y[3]
Photographic & Optical	Y	Y	25	30
Agriculture (Except Livestock) & Forestry	Y	Y[6]	Y[7]	Y[3]
Livestock Farming & Breeding	Y	Y[6]	Y[7]	N
Mining & Fishing, Resource Production & Extraction	Y	Y	Y	Y
RECREATIONAL				
Outdoor Sports Arenas & Spectator Sports	Y	Y[5]	Y[5]	N
Outdoor Music Shells, Amphitheaters	Y	N	N	N
Nature Exhibits & Zoos	Y	Y	N	N
Amusement Parks, Resorts & Camps	Y	Y	Y	N
Golf Courses, Riding Stables & Water Recreation	Y	Y	25	30

KEY:

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 the design and construction of the structure.

25, 30 or 35: Land use and related structures generally compatible; measures to achieve NLR of 25, 30 or 35 dB must be incorporated into design and construction of structure.

NOTES:

1 Where the community determines that residential uses must be allowed, measures to achieve outdoor to indoor Noise Level Reduction (NLR) of at least 25 dB and 30dB should be incorporated into building codes and be considered in individual approvals. Normal construction can be expected to provide and NLR of 20dB. Thus, the reduction requirements are often stated as 5, 10 or 15dB 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 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 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 NLR of 25.

7 Residential buildings require NLR of 30.

As illustrated by the noise contours overlay, the 65 DNL contour is nearly all contained within the airport property for the current operations as well as for forecast 2017 airport operations. A small portion runs outside the property line on the west side of the airfield at the north end of airport property and the contour run alongside the property line at the sound end. No land use compatibility issues relating to noise level are identified.

AIRPORT PROPERTY MAP

The Airport Property Map provides information on existing airport property including fee simple acquisitions as well as avigation easements. Future property acquisition is also identified. POSH's latest property map, also identified as an Exhibit A map, is dated 2004. The Exhibit A, in addition to more recent property information available was used to produce the Airport Property Map, which is included as the last drawing in the ALP set. Based on the current airport property and the proposed acquisitions, existing and future property lines are depicted in red and green, respectively, with hatching used to identify avigation easements.

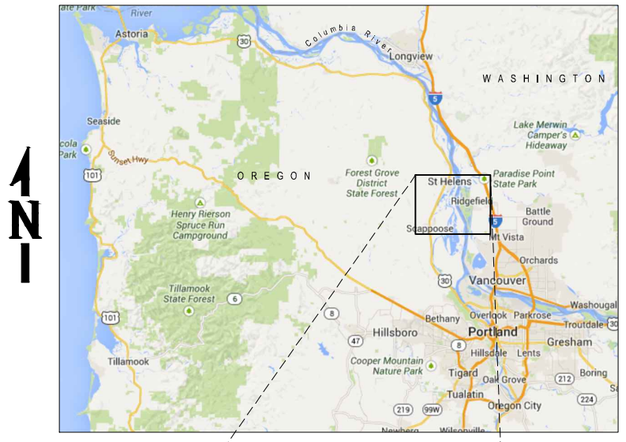
COLUMBIA COUNTY, OREGON

SCAPPOOSE INDUSTRIAL AIRPARK

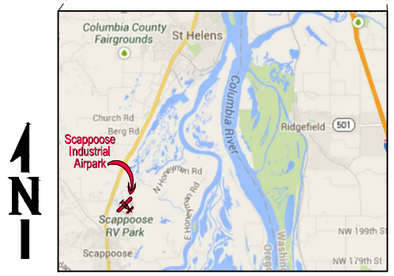
MASTER PLAN UPDATE

A.I.P. #3-41-0056-18

MARCH 2016



LOCATION MAP



VICINITY MAP

SOURCE: GOOGLE MAPS

SHEET	DESCRIPTION
1	COVER SHEET
2	AIRPORT LAYOUT PLAN
3	AIRPORT LAYOUT PLAN DATA SHEET
4	AIRPORT AIRSPACE PLAN
5	RUNWAY 15–33 INNER APPROACH PLAN AND PROFILE
6	RUNWAY 15–33 DEPARTURE SURFACE PLAN AND PROFILE
7	TERMINAL AREA PLAN
8	LAND USE PLAN
9	AIRPORT NOISE CONTOURS
10	AIRPORT PROPERTY MAP

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COVER SHEET

PORT OF ST. HELENS
SCAPPOOSE INDUSTRIAL AIRPARK MASTER PLAN UPDATE

PROJECT NUMBER	DRAWING FILE NAME	SCALE
037610/0471W	037610-AIRP-CS01	AS NOTED

SHEET NUMBER 1

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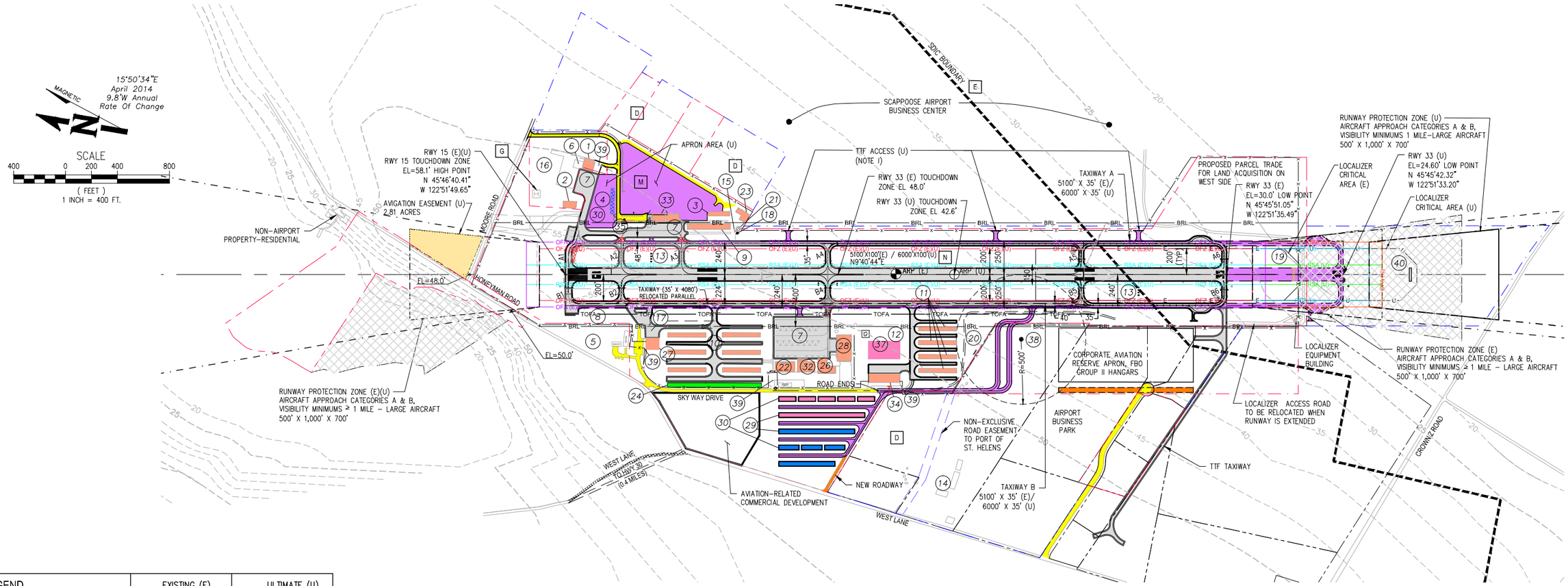

LEGEND	EXISTING (E)	ULTIMATE (U)
AIRFIELD PAVEMENT		
ROADWAY PAVEMENT		
TAXIWAY HOLDLINE		
PAVEMENT REMOVAL		
BUILDING REMOVAL		
BUILDINGS		
BUILDING CONSTRUCTION STAGE 1		
BUILDING CONSTRUCTION STAGE 2		
BUILDING CONSTRUCTION STAGE 3		
PROPERTY LINE		
BUILDING RESTRICTION LINE (BRL)	BRL	SAME
R/W OBJECT FREE AREA (OFA)	OFA (E)	OFA (U)
R/W SAFETY AREA (RSA)	RSA (E)	RSA (U)
R/W OBJECT FREE ZONE (OFZ)	OFZ (E)	OFZ (U)
RUNWAY PROTECTION ZONE (RPZ)		
TOPOGRAPHIC CONTOUR	35	SAME
SURVEY MONUMENT [B]		
AIRPORT FENCE	x	
VEHICLE GATE		
AVIGATION EASEMENT		
AIRPORT REFERENCE POINT	ARP (E)	ARP (U)
ROTATING BEACON		SAME
REIL		

NOTES:

[A] COORDINATE DATA FROM NATIONAL OCEAN SERVICE OBSTRUCTION FOR SCAPPOOSE INDUSTRIAL AIRPARK (NOV. 1994), THEN MODIFIED BASED ON LENGTH OF RUNWAY EXTENSION. HORIZONTAL DATUM NAD 83, VERTICAL DATUM NAVD 88.

[B] A TOPOGRAPHIC SURVEY HAS NOT BEEN PERFORMED. BRASS CAP SET IN CONCRETE.

[C] POWER SUPPLIED TO AIRPORT BY COLUMBIA RIVER P.U.D.

[D] AVIATION RESERVE. TO BE ACQUIRED WHEN LAND BECOMES AVAILABLE.

[E] PROTECTED FROM 100-YEAR FLOOD BY LEVEE; SUBJECT TO POSSIBLE FAILURE OR OVERTOPPING DURING LARGE FLOOD (SOURCE; FEMA MAP).

[F] BUILDING RESTRICTION LINE SHOWN FOR RUNWAY 15-33 IS BASED ON A 21 FOOT HIGH BUILDING. BUILDING INSIDE BRL ON EAST SIDE IS 15 FEET HIGH.

[G] CURRENTLY USED FOR HELICOPTER PARKING.

[H] ALL DECLARED DISTANCES ARE 5,100' (E) AND 6,000' (U). THERE ARE NO EXISTING OR FUTURE DISPLACED OR RELOCATED THRESHOLDS.

[I] FUTURE THROUGH-THE-FENCE (TTF) ACCESS POINTS IDENTIFIED TO SERVE PROPOSED SCAPPOOSE AIRPORT BUSINESS CENTER DEVELOPMENT.

[J] ELEVATIONS IN FEET ABOVE MEAN SEA LEVEL (MSL) AT TOP OF OBJECT. TRAVERSE WAY ELEVATIONS DO NOT INCLUDE TRAVERSE WAY ADJUSTMENT (17' FOR INTERSTATE HIGHWAYS AND 15' FOR OTHER PUBLIC ROADS).

[K] EXISTING AND ULTIMATE ARC IS B-II. HOWEVER, SOME DEVELOPMENT AREAS ARE PROTECTED FOR C-II UPGRADE (WITH INCREASED SEPARATIONS) FOR DISTANT FUTURE PLANNING.

[L] RUNWAY MEETS LINE OF SIGHT REQUIREMENTS.

[M] APRON SPACE TO REMEDY CIRCULATION ISSUES, REPORTED BY AIRPORT USERS, IN THE VICINITY OF THE FBO.

[N] THE EXISTING RUNWAY LENGTH IS SUFFICIENT TO SERVE THE NEEDS OF THE EXISTING AND PROJECTED CRITICAL AIRCRAFT FOR THE 20-YEAR PLANNING PERIOD. ULTIMATE RUNWAY EXTENSION WOULD REQUIRE JUSTIFICATION.

[O] BUILDINGS/FACILITIES ARE NUMBERED AND CIRCLED IN BLACK ON THE ALP. PLEASE REFER TO THE TERMINAL AREA PLAN (SHEET 7) FOR THE BUILDINGS/FACILITIES TABLE.

NOTE:

NON-STANDARD CONDITIONS

ITEM	AIRPLANE DESIGN GROUP		STANDARD		NON-STANDARD CONDITION		REMARKS
	EXISTING	ULTIMATE	EXISTING	ULTIMATE	EXISTING	ULTIMATE	
R/W TO PARALLEL T/W SEPARATION	B-II	B-II	240'	240'	VARIES (224'-240')	NONE	TO BE RESOLVED WITH RELOCATED TAXIWAY

APPROVAL BLOCK	
AIRPORT SPONSOR: PORT OF ST. HELENS	
Signature	
Title	Date
FEDERAL AVIATION ADMINISTRATION:	
Signature	
Title	Date
Approval letter dated _____	

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AIRPORT LAYOUT PLAN

PORT OF ST. HELENS
SCAPPOOSE INDUSTRIAL AIRPARK MASTER PLAN UPDATE

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037610/0471W	037610-AIRP-AL01	AS NOTED

SHEET NUMBER
2

[DATE: 3/3/2016 4:09 PM] [AUTHOR: mdane] [PLOTTER: DWG To PDF.pc3] [STYLE: WHP-Standard.ctb]
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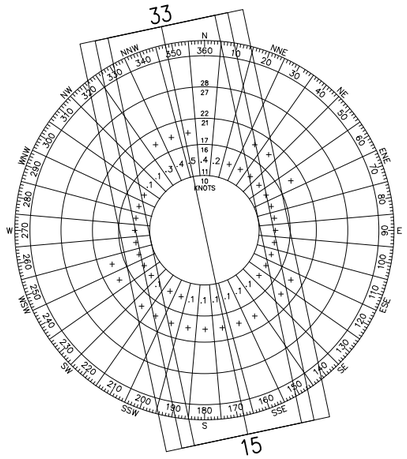
ALL WEATHER

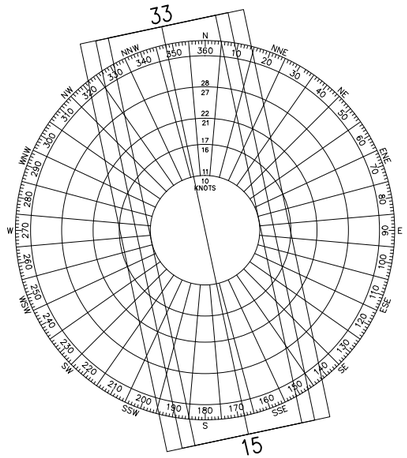


RUNWAY	10.5-KNOT	13-KNOT	16-KNOT
15/33	99.75%	99.88%	99.99%

* WIND ANALYSIS-R/W 15/33
SOURCE: NATIONAL CLIMATIC DATA CENTER, STATION 72683, SCAPPOOSE, OREGON
PERIOD OF RECORD 2001-2009

VFR

VFR CONDITIONS: MINIMUMCLOUD CEILING IS GREATER THAN OR EQUAL TO 1,000 FEET AND VISIBILITY IS GREATER THAN OR EQUAL TO 3 MILES.

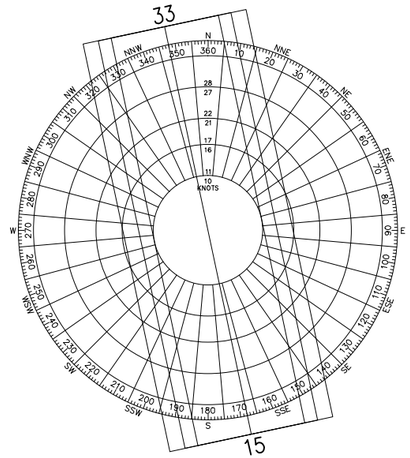


RUNWAY	10.5-KNOT	13-KNOT	16-KNOT
15/33	100%	100%	100%

* WIND ANALYSIS-R/W 15/33
SOURCE: NATIONAL CLIMATIC DATA CENTER, STATION 72683, SCAPPOOSE, OREGON
PERIOD OF RECORD 2001-2009

IFR

IFR CONDITIONS: MINIMUM CLOUD CEILING IS GREATER THAN OR EQUAL TO 200 FEET AND LESS THAN 1,000 FEET AND/OR VISIBILITY IS GREATER THAN OR EQUAL TO 0.5 MILES AND LESS THAN 3 MILES.



RUNWAY	10.5-KNOT	13-KNOT	16-KNOT
15/33	100%	100%	100%

* WIND ANALYSIS-R/W 15/33
SOURCE: NATIONAL CLIMATIC DATA CENTER, STATION 72683, SCAPPOOSE, OREGON
PERIOD OF RECORD 2001-2009

AIRPORT DATA	EXISTING (E)	ULTIMATE (U)
AIRPORT ELEVATION (FEET ABOVE MSL)	58.1'	SAME
AIRPORT REFERENCE POINT (ARP) [A]	N 45° 46' 15.73" W 122° 51' 42.57"	N 45° 46' 11.37" W 122° 51' 41.53"
MEAN DAILY MAXIMUM TEMPERATURE	82°F	SAME
AIRPORT REFERENCE CODE	B-II	SAME [R]
AIRPORT NAVIGATIONAL AIDS	BEACON	SAME
NPIAS ROLE OREGON SYSTEM PLAN ROLE-URBAN GA	GA	SAME
TAXIWAY LIGHTING	REFLECTORS	MITL
TAXIWAY MARKINGS	℄	SAME
WEATHER REPORTING	ASOS	SAME (TO BE RELOCATED)
OTHER FACILITIES	SEGMENTED CIRCLE, 3 WIND CONES	SAME

TAXIWAY DATA	WIDTH (E)/(U)	TSA (E)(U)	TOFA (E)(U)	LIGHTING (E)/(U)
A	35'/SAME	79'/SAME	131'/SAME	REFLECTORS/MITL
A1	50'/SAME	79'/SAME	131'/SAME	REFLECTORS/MITL
A2	35'/SAME	79'/SAME	131'/SAME	REFLECTORS/MITL
A3	35'/SAME	79'/SAME	131'/SAME	REFLECTORS/MITL
A4	35'/SAME	79'/SAME	131'/SAME	REFLECTORS/MITL
A5	35'/SAME	79'/SAME	131'/SAME	REFLECTORS/MITL
A6	35'/SAME	79'/SAME	131'/SAME	REFLECTORS/MITL
B	40'/SAME	79'/SAME	131'/SAME	REFLECTORS/MITL
B1	35'/SAME	79'/SAME	131'/SAME	REFLECTORS/MITL
B2	35'/SAME	79'/SAME	131'/SAME	REFLECTORS/MITL
B3	35'/SAME	79'/SAME	131'/SAME	REFLECTORS/MITL
B4	35'/SAME	79'/SAME	131'/SAME	REFLECTORS/MITL
B5	35'/SAME	79'/SAME	131'/SAME	REFLECTORS/MITL
B6	35'/SAME	79'/SAME	131'/SAME	REFLECTORS/MITL

RUNWAY DATA		RUNWAY 15-33	
		EXISTING (E)	ULTIMATE (U)
RDC RRC		B-II/BII VIS B-II/BII VIS	SAME [R]
CRITICAL AIRCRAFT		KING AIR	CESSNA 560 CITATION EXCEL
RUNWAY DIMENSIONS [H]		5,100' x 100'	6,000' x 100'
PAVEMENT TYPE		ASPHALT CONCRETE	SAME
PAVEMENT DESIGN STRENGTH		SW-30,000LBS/ DW-50,000LBS	SAME
RUNWAY LIGHTING		MIRL	SAME
RUNWAY MARKING		NPI/BASIC	SAME
EFFECTIVE GRADIENT (%) [L]		0.55	0.55
VISUAL APPROACH AIDS		REILS, PAPI, ROTATING BEACON	SAME
INSTRUMENT APPROACH AIDS		LOCALIZER, DME	SAME
RSA SAFETY AREA (L/W)		5,700' X 150'	6,600' x 150'
OFA DIMENSIONS (L/W)		5,700' X 500'	6,600' x 500'
OFZ DIMENSIONS (L/W)*		5,500' X 400'	6,400' x 400'
RUNWAY END COORDINATES NAD 83	RWY 15	N 45° 46' 40.41" W 122° 51' 49.65"	SAME
	RWY 33	N 45° 45' 51.05" W 122° 51' 35.49"	N 45° 45' 42.32" W 122° 51' 33.20"
APPROACH TYPE		NPI/VISUAL	SAME
APPROACH SLOPES**	FAR PART 77	34:1/20:1	SAME
	ACTUAL	SAME	SAME
APPROACH VISIBILITY MIN.		≥ 1 MILE/VISUAL	SAME

* NO OFZ OBJECT PENETRATIONS.
** TSS PENETRATIONS

APPROVAL BLOCK
AIRPORT SPONSOR: PORT OF ST. HELENS
Signature
Title Date
FEDERAL AVIATION ADMINISTRATION:
Signature
Title Date
Approval letter dated _____

"THE PREPARATION OF THESE DOCUMENTS MAY HAVE BEEN SUPPORTED, IN PART THOUGH THE AIRPORT IMPROVEMENT PROGRAM FINANCIAL ASSISTANCE FROM THE FEDERAL AVIATION ADMINISTRATION (PROJECT NUMBER 3-41-0056-18) 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 THESE DOCUMENTS BY THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATE IN ANY DEVELOPMENT DEPICTED HEREIN NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE IN ACCORDANCE WITH APPROPRIATE PUBLIC LAWS."

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SHEET INFO	
DESIGNED	GE
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CHECKED	WR
APPROVED	REA
LAST EDIT	3/19/2015
PLOT DATE	3/3/2016
SUBMITTAL	

REVISIONS			
NO.	BY	DATE	REMARKS

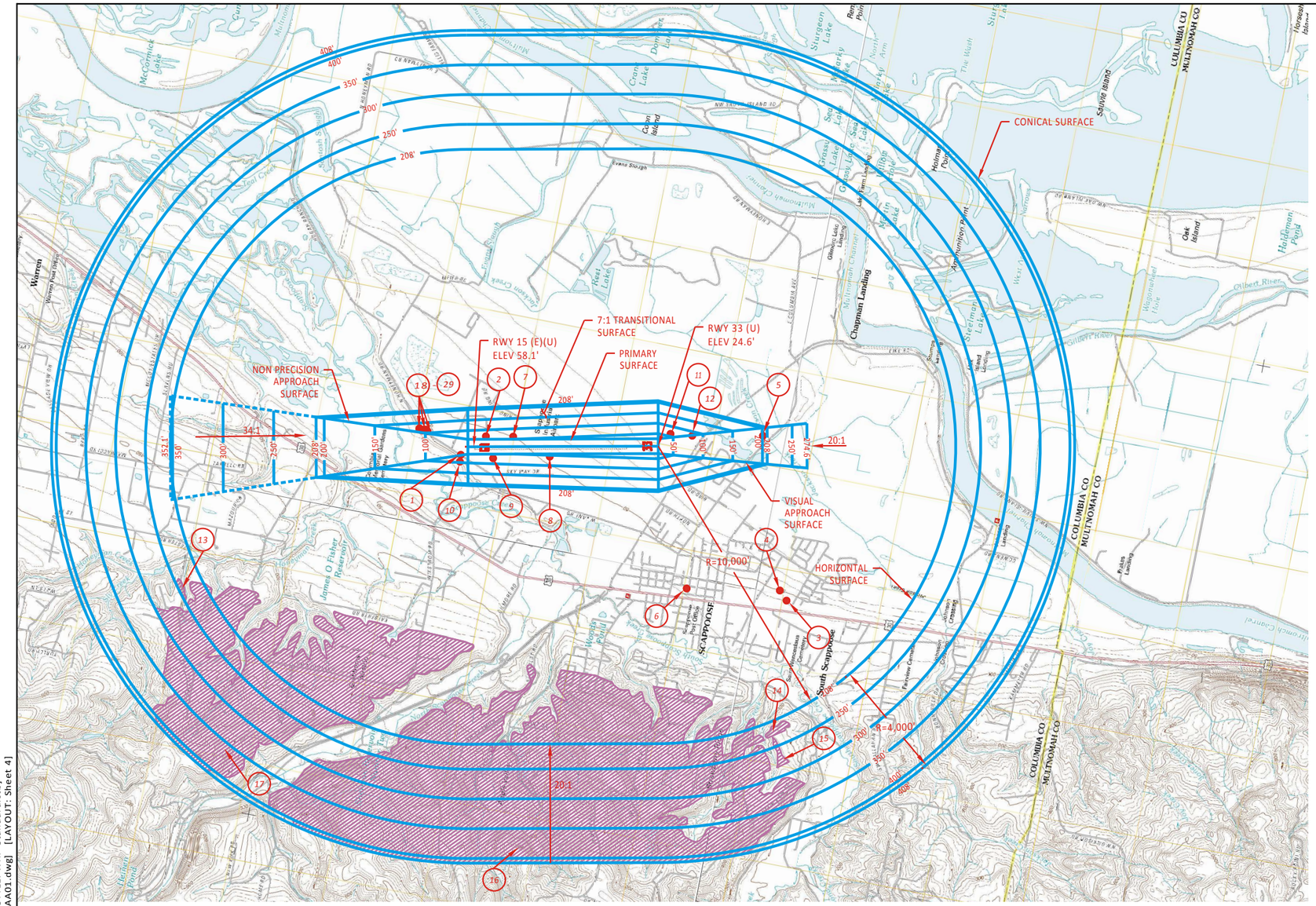
AIRPORT LAYOUT PLAN DATA SHEET

PORT OF ST. HELENS
SCAPPOOSE INDUSTRIAL AIRPARK MASTER PLAN UPDATE

PROJECT NUMBER	DRAWING FILE NAME	SCALE
037610/0471W	037610-AIRP-AD01	AS NOTED

SHEET NUMBER
3

[DATE: 3/3/2016 4:13 PM] [AUTHOR: rtemplado] [PLOTTER: DWG To PDF.pc3] [STYLE: WHP-Standard.ctb]
[PATH: P:\Port of St Helens\037610\Design\Drawings\Civil\037610-AIRP-AD01.dwg] [LAYOUT: Sheet 3]



LEGEND:

- OBSTRUCTIONS
- GROUP AND MULTIPLE OBSTRUCTIONS

NOTE:

OBSTRUCTIONS/OBJECTS ARE IDENTIFIED BY RED NUMBER CALLOUTS ON THE DRAWING WITH A DESCRIPTION PROVIDED IN THE OBSTRUCTION DATA TABLE.

15°50'34"E
April 2014
9.8'W Annual
Rate Of Change

SCALE

2000 0 1000 2000 4000

(FEET)
1 INCH = 2000 FT.

OBSTRUCTION DATA TABLE

NO. (#)	DESCRIPTION	ELEVATION	PART 77 SURFACE	SURFACE ELEVATION	PENETRATION	DISPOSITION
1	ROAD (N)*	65	NON-PRECISION APPROACH SURFACE	64	1	SEE NOTE BELOW
2	OL ON LTD WSK	79	TRANSITIONAL SURFACE	69	10	TO REMAIN
3	TOWER	150	HORIZONTAL SURFACE	208	-58	N/A
4	TOWER	169	HORIZONTAL SURFACE	208	-39	N/A
5	POLE	50	VISUAL APPROACH SURFACE	201	-151	N/A
6	POLE	50	HORIZONTAL SURFACE	208	-158	N/A
7	APBN	98	TRANSITIONAL SURFACE	62	36	REMOVE
8	OL ON LTD WSK	72	TRANSITIONAL SURFACE	56	16	TO REMAIN
9	OL ON LTD WSK	87	TRANSITIONAL SURFACE	73	14	TO REMAIN
10	TREE	158	TRANSITIONAL SURFACE	100	58	REMOVE
11	TREE	130	TRANSITIONAL SURFACE	63	67	REMOVE
12	TREE	142	TRANSITIONAL SURFACE	99	43	REMOVE
13	GROUND SURFACE	200-220	CONICAL SURFACE	VARIES	VARIES	FIXED; NO ACTION
14	GROUND SURFACE	200-240	CONICAL SURFACE	VARIES	VARIES	FIXED; NO ACTION
15	GROUND SURFACE	250-265	CONICAL SURFACE	VARIES	VARIES	FIXED; NO ACTION
16	GROUND SURFACE	200-860	CONICAL SURFACE	VARIES	VARIES	FIXED; NO ACTION
17	GROUND SURFACE	200-560	CONICAL SURFACE	VARIES	VARIES	FIXED; NO ACTION
18	TREE	152.29	TRANSITIONAL SURFACE	125.88	26.41	REMOVE
19	TREE	154.77	TRANSITIONAL SURFACE	128.42	26.35	REMOVE
20	TREE	158.69	TRANSITIONAL SURFACE	129.29	29.4	REMOVE
21	TREE	159.43	TRANSITIONAL SURFACE	129.21	30.22	REMOVE
22	TREE	165.72	TRANSITIONAL SURFACE	131.58	34.14	REMOVE
23	TREE	145.48	TRANSITIONAL SURFACE	135.79	9.69	REMOVE
24	TREE	149.79	TRANSITIONAL SURFACE	135.33	14.46	REMOVE
25	TREE	136.53	TRANSITIONAL SURFACE	134.79	1.74	REMOVE
26	TREE	170.43	TRANSITIONAL SURFACE	139.59	30.84	REMOVE
27	TREE	181.89	TRANSITIONAL SURFACE	139.42	42.47	REMOVE
28	TREE	151.38	TRANSITIONAL SURFACE	129.41	21.97	REMOVE
29	TREE	151.1	TRANSITIONAL SURFACE	138.44	12.66	REMOVE

NOTE: * ROAD ELEVATION IS AN APPROXIMATION AND NEEDS TO BE SURVEYED FOR CONFIRMATION PRIOR TO ADDRESSING IT AS AN OBSTRUCTION.

OBSTRUCTION NOTES

1. THIS DRAWING REFLECTS PLANNING STANDARDS SPECIFIC TO THIS AIRPORT, AND IS NOT A PRODUCT OF DETAILED ENGINEERING DESIGN ANALYSIS. IT IS NOT INTENDED TO BE USED FOR CONSTRUCTION DOCUMENTATION OR NAVIGATION.

2. ALL COORDINATES ARE NAD 83.

3.TOPOGRAPHIC INFORMATION OBTAINED FROM USGS 7.5 MINUTE SURVEY MAPS, "CHAPMAN, OREGON" 2011, SAINT HELENS, OREGON" 2011, "DIXIE MOUNTAIN, OREGON" 2011, AND "SAUVIE ISLAND, OREGON" 2011.

4. OBSTRUCTIONS LOCATION AND ELEVATIONS OBTAINED FROM FAA ORS DATABASE AS OF MARCH 2014 AND PREVIOUS MASTER PLAN. TREE ELEVATIONS OBTAINED FROM THE PUBLISHED DEPARTURE PROCEDURES FOR SPB.

5. ELEVATIONS IN FEET ABOVE MEAN SEA LEVEL (MSL) AT TOP OF OBJECT. TRAVERSWAY ELEVATIONS INCLUDE TRAVERSWAY ADJUSTMENT (17' FOR INTERSTATE HIGHWAYS AND 15' FOR OTHER PUBLIC ROADS).

6. PART 77 SURFACES PROTECTED BY CITY OF SCAPPOOSE AND COLUMBIA COUNTY AIRPORT OVERLAY ZONE.

7. SEE SHEET 5 FOR A MORE DETAILED VIEW OF CLOSE-IN OBSTRUCTIONS.

"THE PREPARATION OF THESE DOCUMENTS MAY HAVE BEEN SUPPORTED, IN PART THOUGH THE AIRPORT IMPROVEMENT PROGRAM FINANCIAL ASSISTANCE FROM THE FEDERAL AVIATION ADMINISTRATION (PROJECT NUMBER 3-41-0056-18) 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 THESE DOCUMENTS BY THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATE IN ANY DEVELOPMENT DEPICTED HEREIN NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE IN ACCORDANCE WITH APPROPRIATE PUBLIC LAWS."

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SHEET INFO	
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SUBMITTAL	

REVISIONS			
NO.	BY	DATE	REMARKS

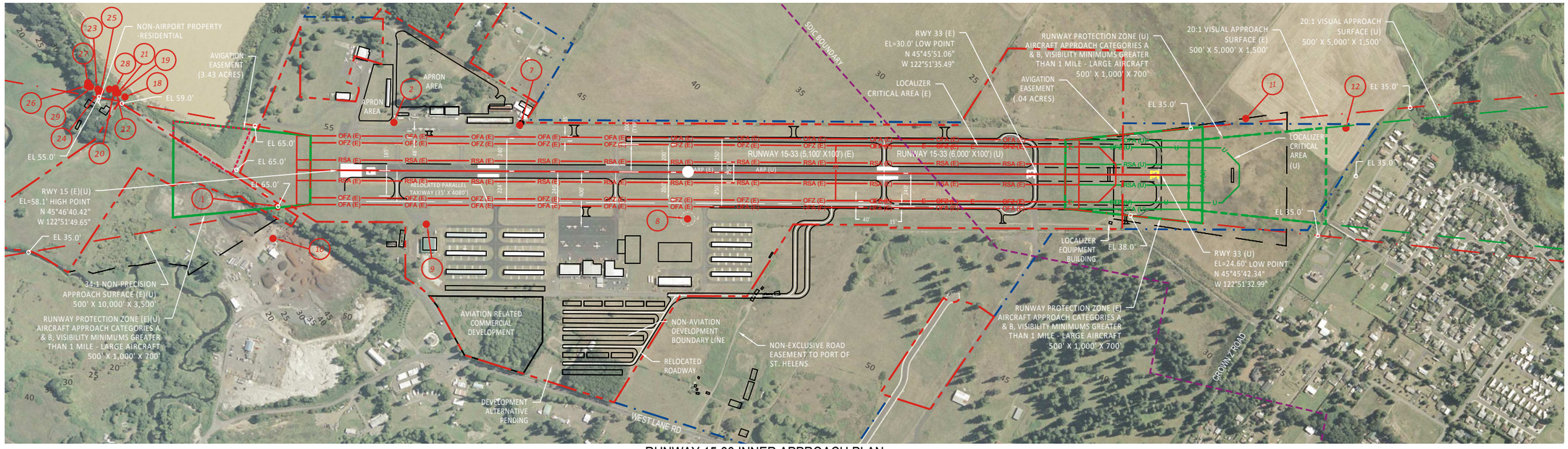
AIRPORT AIRSPACE PLAN

PORT OF ST. HELENS
SCAPPOOSE INDUSTRIAL AIRPARK MASTER PLAN UPDATE

PROJECT NUMBER	DRAWING FILE NAME	SCALE
037610/0471W	037610-AIRP-AA01	AS NOTED

SHEET NUMBER
4

[DATE: 6/11/2014 11:59 AM] [AUTHOR: rtemplado] [PLOTTER: None] [STYLE: WHP-Standard.ctb]
[PATH: P:\Port of St Helens\037610\Design\Drawings\Civil\037610-AIRP-AA01.dwg] [LAYOUT: Sheet 4]



RUNWAY 15-33 INNER APPROACH PLAN

SCALE: HORIZONTAL 1"=400'

OBSTRUCTION NOTES

1. THIS DRAWING REFLECTS PLANNING STANDARDS SPECIFIC TO THIS AIRPORT, AND IS NOT A PRODUCT OF DETAILED ENGINEERING DESIGN ANALYSIS. IT IS NOT INTENDED TO BE USED FOR CONSTRUCTION DOCUMENTATION OR NAVIGATION.

2. ALL COORDINATES ARE NAD 83.

3.TOPOGRAPHIC INFORMATION OBTAINED FROM USGS 7.5 MINUTE SURVEY MAPS, "CHAPMAN, OREGON" 2011, SAINT HELENS, OREGON" 2011, "DIXIE MOUNTAIN, OREGON" 2011, AND "SAUVIE ISLAND, OREGON" 2011.

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5. ELEVATIONS IN FEET ABOVE MEAN SEA LEVEL (MSL) AT TOP OF OBJECT. TRAVERSWAY ELEVATIONS INCLUDE TRAVERSWAY ADJUSTMENT (17' FOR INTERSTATE HIGHWAYS AND 15' FOR OTHER PUBLIC ROADS).

6. PART 77 SURFACES PROTECTED BY CITY OF SCAPPOOSE AND COLUMBIA COUNTY AIRPORT OVERLAY ZONE.

7. SEE SHEET 5 FOR A MORE DETAILED VIEW OF CLOSE-IN OBSTRUCTIONS.

OBSTRUCTION DATA TABLE

NO.	DESCRIPTION	ELEVATION	PART 77 SURFACE	SURFACE ELEVATION	PENETRATION	DISPOSITION
1	ROAD (N)*	65	NON-PRECISION APPROACH SURFACE	64	1	SEE NOTE BELOW
2	OL ON LTD WSK	79	TRANSITIONAL SURFACE	69	10	TO REMAIN
7	APBN	98	TRANSITIONAL SURFACE	62	36	REMOVE
8	OL ON LTD WSK	72	TRANSITIONAL SURFACE	56	16	TO REMAIN
9	OL ON LTD WSK	87	TRANSITIONAL SURFACE	73	14	TO REMAIN
10	TREE	158	TRANSITIONAL SURFACE	100	58	REMOVE
11	TREE	130	TRANSITIONAL SURFACE	63	67	REMOVE
12	TREE	142	TRANSITIONAL SURFACE	99	43	REMOVE

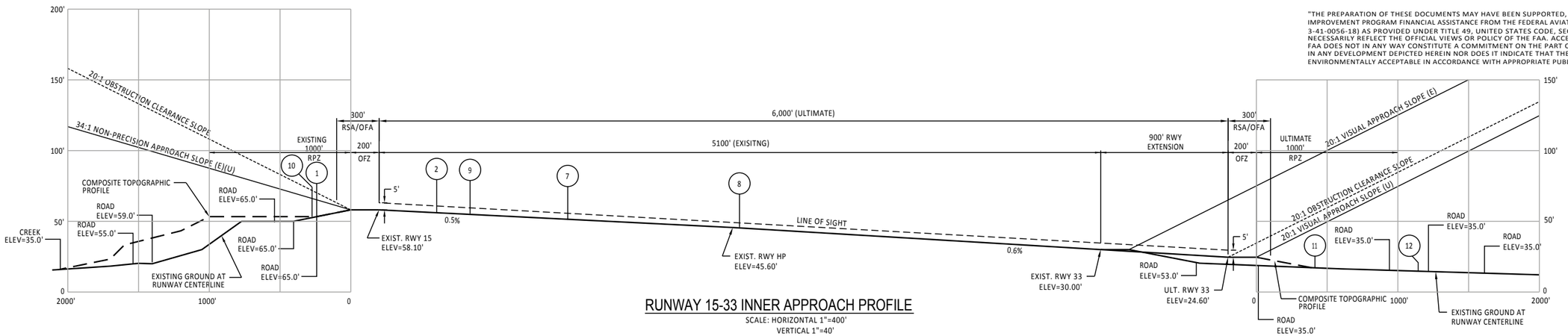
NOTE: * ROAD ELEVATION IS AN APPROXIMATION AND NEEDS TO BE SURVEYED FOR CONFIRMATION PRIOR TO ADDRESSING IT AS AN OBSTRUCTION.

18	TREE	152.29	TRANSITIONAL SURFACE	125.88	26.41	REMOVE
19	TREE	154.77	TRANSITIONAL SURFACE	128.42	26.35	REMOVE
20	TREE	158.69	TRANSITIONAL SURFACE	129.29	29.4	REMOVE
21	TREE	159.43	TRANSITIONAL SURFACE	129.21	30.22	REMOVE
22	TREE	165.72	TRANSITIONAL SURFACE	131.58	34.14	REMOVE
23	TREE	145.48	TRANSITIONAL SURFACE	135.79	9.69	REMOVE
24	TREE	149.79	TRANSITIONAL SURFACE	135.33	14.46	REMOVE
25	TREE	136.53	TRANSITIONAL SURFACE	134.79	1.74	REMOVE
26	TREE	170.43	TRANSITIONAL SURFACE	139.59	30.84	REMOVE
27	TREE	181.89	TRANSITIONAL SURFACE	139.42	42.47	REMOVE
28	TREE	151.38	TRANSITIONAL SURFACE	129.41	21.97	REMOVE
29	TREE	151.1	TRANSITIONAL SURFACE	138.44	12.66	REMOVE

SCALE
400 0 200 400 800
(FEET)
1 INCH = 400 FT.

LEGEND:
OBSTRUCTIONS

NOTE:
OBSTRUCTIONS/OBJECTS ARE IDENTIFIED BY RED NUMBER CALLOUTS ON THE DRAWING WITH A DESCRIPTION PROVIDED IN THE OBSTRUCTION DATA TABLE.



RUNWAY 15-33 INNER APPROACH PROFILE

SCALE: HORIZONTAL 1"=400'
VERTICAL 1"=40'

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SUBMITTAL	

REVISIONS			
NO.	BY	DATE	REMARKS

RUNWAY 15-33 INNER APPROACH PLAN AND PROFILE

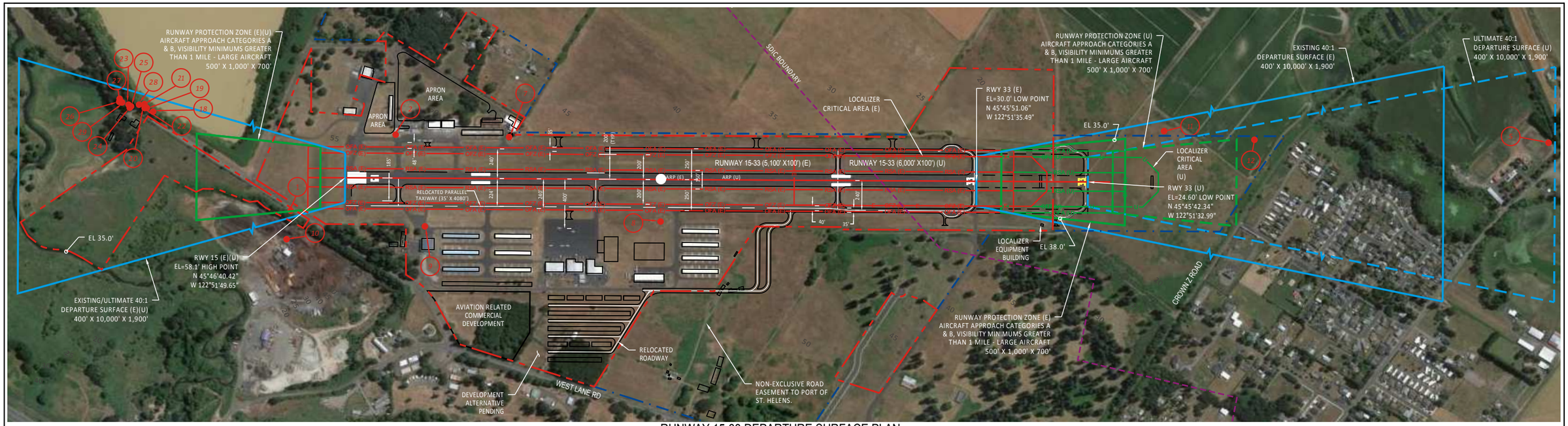
PORT OF ST. HELENS

SCAPPOOSE INDUSTRIAL AIRPARK MASTER PLAN UPDATE

PROJECT NUMBER	DRAWING FILE NAME	SCALE
037610/0471W	037610-AIRP-PP01	AS NOTED

SHEET NUMBER
5

[DATE: 6/16/2014 8:28 AM] [AUTHOR: rtemplado] [PLOTTER: None] [STYLE: WHP-Standard.ctb]
[PATH: P:\Port of St Helens\037610\Design\Drawings\Civil\037610-AIRP-PP01.dwg] [LAYOUT: Sheet 5]



RUNWAY 15-33 DEPARTURE SURFACE PLAN

SCALE: HORIZONTAL 1"=400'

OBSTRUCTION DATA TABLE						
NO. (#)	DESCRIPTION	ELEVATION	PART 77 SURFACE	SURFACE ELEVATION	PENETRATION	DISPOSITION
1	ROAD (N)*	65	NON-PRECISION APPROACH SURFACE	64	1	SEE NOTE BELOW
2	OL ON LTD WSK	79	TRANSITIONAL SURFACE	69	10	TO REMAIN
5	POLE	50	VISUAL APPROACH SURFACE	201	-151	N/A
11	TREE	130	TRANSITIONAL SURFACE	63	67	REMOVE
12	TREE	142	TRANSITIONAL SURFACE	99	43	REMOVE
18	TREE	152.29	TRANSITIONAL SURFACE	125.88	26.41	REMOVE
19	TREE	154.77	TRANSITIONAL SURFACE	128.42	26.35	REMOVE
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23	TREE	145.48	TRANSITIONAL SURFACE	135.79	9.69	REMOVE
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NOTE: * ROAD ELEVATION IS AN APPROXIMATION AND NEEDS TO BE SURVEYED FOR CONFIRMATION PRIOR TO ADDRESSING IT AS AN OBSTRUCTION.

N

SCALE
400 0 200 400 800
(FEET)
1 INCH = 400 FT.

LEGEND:
OBSTRUCTIONS

NOTE:
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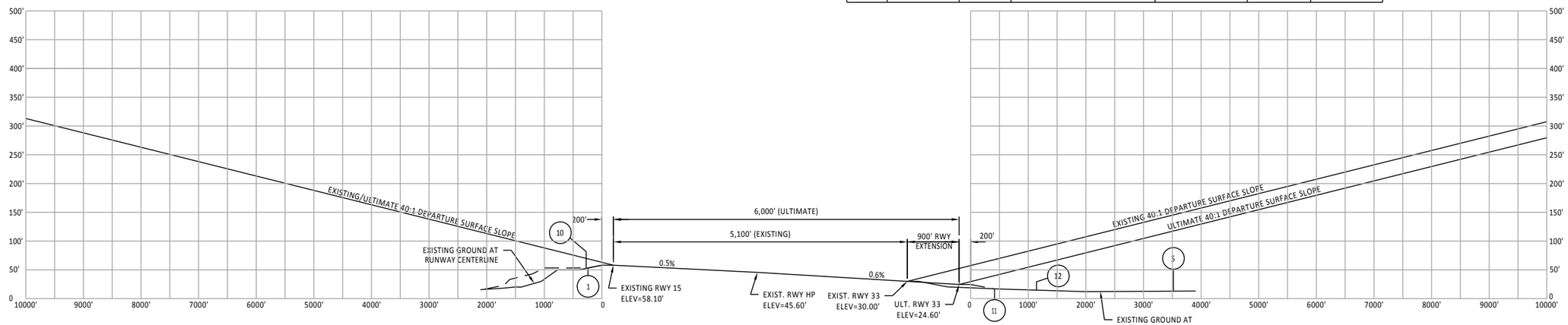

RUNWAY 15-33 DEPARTURE SURFACE PROFILE

SCALE: HORIZONTAL 1"=1000'
VERTICAL 1"=100'

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SUBMITTAL	

REVISIONS			
NO.	BY	DATE	REMARKS

RUNWAY 15-33 DEPARTURE SURFACE PLAN AND PROFILE

PORT OF ST. HELENS
SCAPPOOSE INDUSTRIAL AIRPARK MASTER PLAN UPDATE

PROJECT NUMBER	DRAWING FILE NAME	SCALE
037610/0471W	037610-AIRP-PP02	AS NOTED

SHEET NUMBER
6

[DATE: 7/15/2014 6:42 AM] [AUTHOR: rtemplado] [PLOTTER: None] [STYLE: WHP-Standard.ctb]
[PATH: P:\Port of St Helens\037610\Design\Drawings\Civil\037610-AIRP-PP02.dwg] [LAYOUT: Sheet 6]

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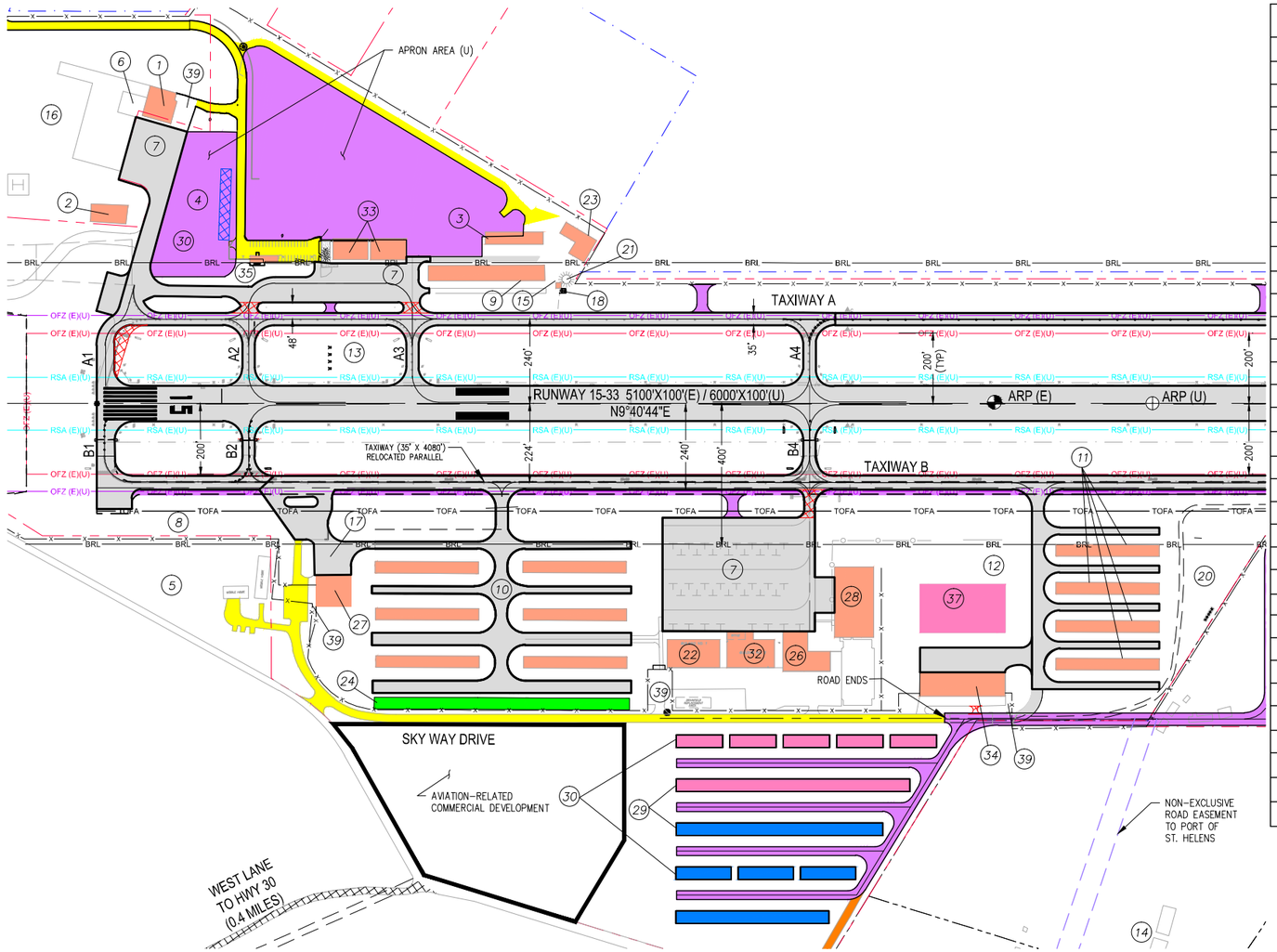

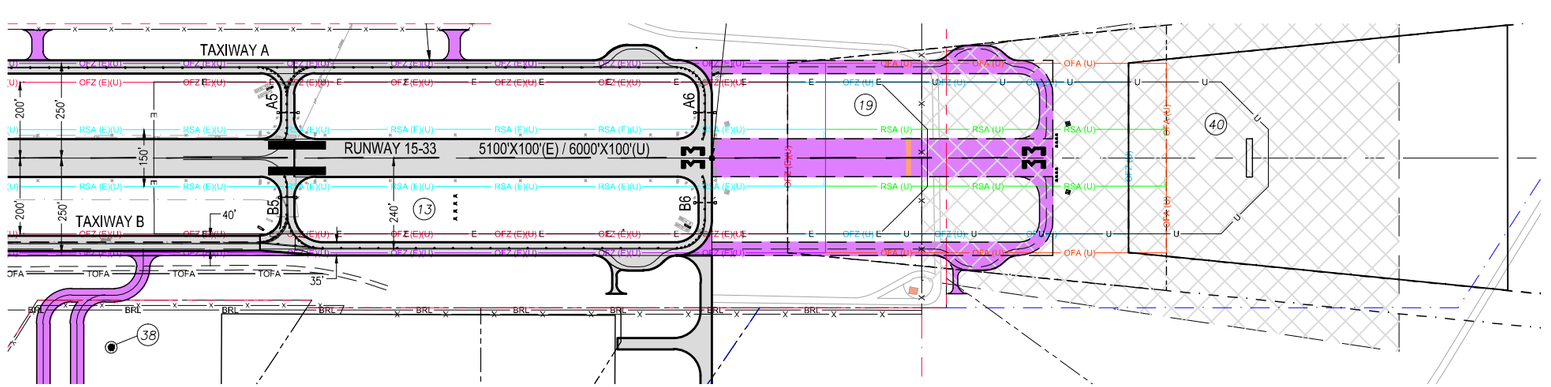

BUILDINGS/FACILITIES	EXISTING (E)	ULTIMATE (U)
FBO HANGAR/OFFICE-TRANSWESTERN AVIATION	1	
OTHER FBO BUILDING (STORAGE)	2	
T-HANGARS	3	
SHED HANGARS (TO BE REMOVED)	4	
COUNTY PARK	5	
FUEL ISLAND	6	
PAVED AIRCRAFT APRON	7	17
TURF AIRCRAFT PARKING AREA	8	
T-HANGARS	9	
T-HANGARS	10	
T-HANGARS	11	
WIND CONE/SEGMENTED CIRCLE	12	
PRECISION APPROACH PATH INDICATOR	13	
FARM BUILDINGS & RESIDENCES (OFF-AIRPORT)	14	
STORAGE SHED	15	
FBO-PRIVATE PROPERTY	16	
ELECTRICAL BUILDING	18	
LOCALIZER ANTENNA (TO BE RELOCATED W/ EXTENSION)	19	40
AUTOMATED SURFACE OBSERVING SYSTEM (TO BE RELOCATED)	20	38
ROTATING BEACON ON TOWER	21	
SPORT COPTER	22	
HANGAR / OFFICES (OVERALL AIRCRAFT SERVICES)	23	
OREGON AERO HANGAR EXPANSION		26
FBO HANGAR (COLUMBIA AVIATION)	27	
OREGON AERO HANGAR	28	
T-HANGARS		29
CONVENTIONAL HANGARS	30	
OREGON AERO	32	
COMPOSITES UNLIMITED	33	
SHERPA AIRCRAFT MANUFACTURING	34	
NORTHWEST ANTIQUE AIRPLANE CLUB	35	
CONVENTIONAL HANGAR		36
CORPORATE EXPANSION AREA		37
AUTO PARKING	39	

LEGEND	EXISTING (E)	ULTIMATE (U)
AIRFIELD PAVEMENT		
ROADWAY PAVEMENT		
TAXIWAY HOLDLINE		
PAVEMENT REMOVAL		
BUILDING REMOVAL		
BUILDINGS		
BUILDING CONSTRUCTION STAGE 1		
BUILDING CONSTRUCTION STAGE 2		
BUILDING CONSTRUCTION STAGE 3		
PROPERTY LINE		
BUILDING RESTRICTION LINE (BRL)	BRL	SAME
R/W OBJECT FREE AREA (OFA)	OFA (E)	OFA (U)
R/W SAFETY AREA (RSA)	RSA (E)	RSA (U)
R/W OBJECT FREE ZONE (OFZ)	OFZ (E)	OFZ (U)
RUNWAY PROTECTION ZONE (RPZ)		
TOPOGRAPHIC CONTOUR	35	SAME
SURVEY MONUMENT B		
AIRPORT FENCE		
VEHICLE GATE		
AVIGATION EASEMENT		
AIRPORT REFERENCE POINT	ARP (E)	ARP (U)
ROTATING BEACON		SAME
REIL		

15°50'34"E
April 2014
9.8'W Annual
Rate Of Change
MAGNETIC

SCALE
200 0 100 200 400
(FEET)
1 INCH = 200 FT.

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SHEET INFO	
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APPROVED	----
LAST EDIT	3/19/2015
PLOT DATE	3/3/2016
SUBMITTAL	

REVISIONS			
NO.	BY	DATE	REMARKS

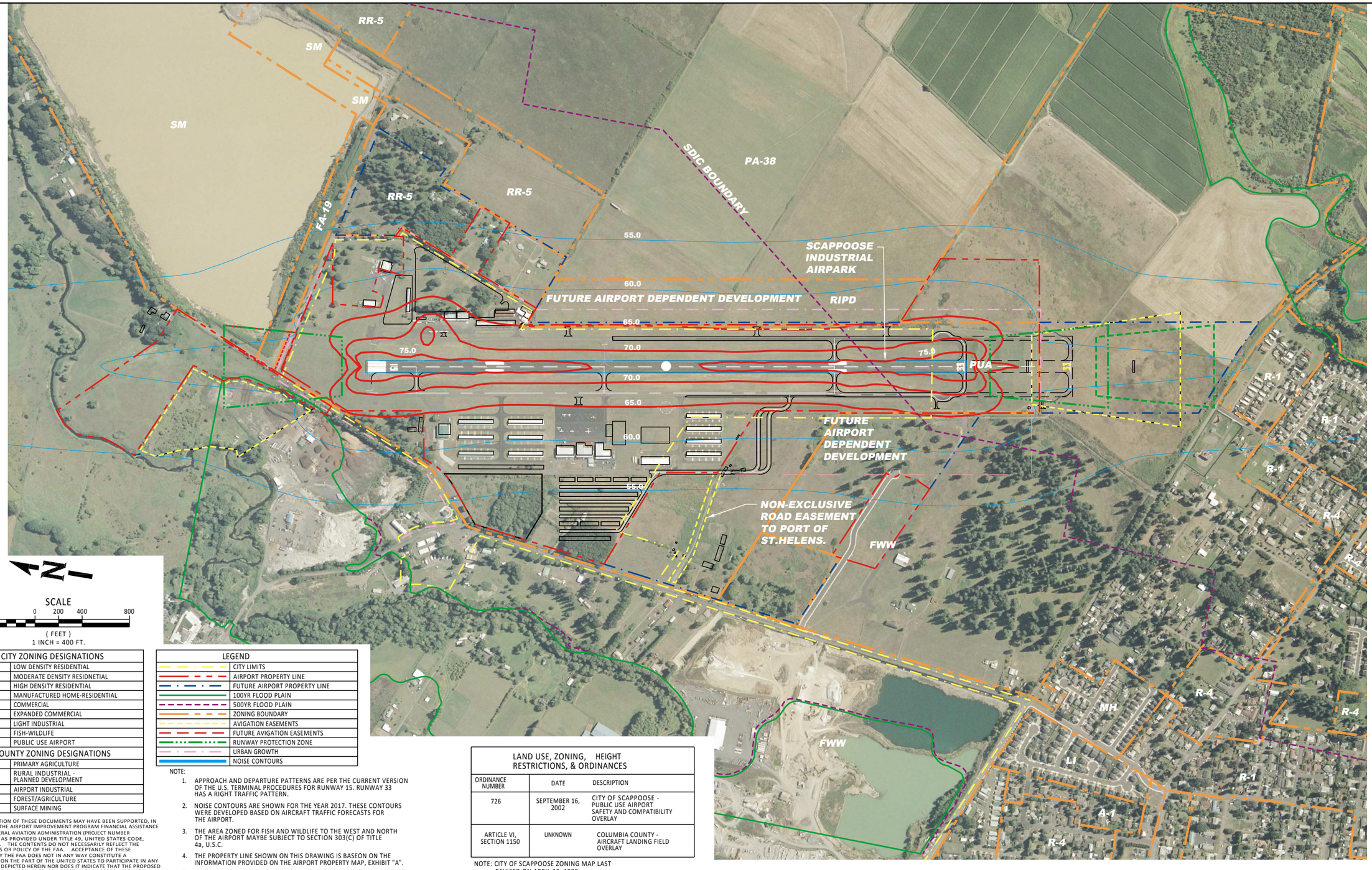
TERMINAL AREA PLAN

PORT OF ST. HELENS
SCAPPOOSE INDUSTRIAL AIRPARK MASTER PLAN UPDATE

PROJECT NUMBER	DRAWING FILE NAME	SCALE
037610/0471W	037610-AIRP-TA01	AS NOTED

SHEET NUMBER
7

[DATE: 3/3/2016 4:44 PM] [AUTHOR: rtemplado] [PLOTTER: DWG To PDF.pc3] [STYLE: WHP-Standard.ctb]
[PATH: P:\Port of St Helens\037610\Design\Drawings\Civil\037610-AIRP-TA01.dwg] [LAYOUT: Sheet 7]



N

SCALE

400 0 200 400 800

(FEET)
1 INCH = 400 FT.

CITY ZONING DESIGNATIONS	
R-1	LOW DENSITY RESIDENTIAL
R-4	MODERATE DENSITY RESIDNETIAL
A-1	HIGH DENSITY RESIDENTIAL
MH	MANUFACTURED HOME-RESIDENTIAL
C	COMMERCIAL
EC	EXPANDED COMMERCIAL
LI	LIGHT INDUSTRIAL
FWW	FISH-WILDLIFE
PUA	PUBLIC USE AIRPORT
COUNTY ZONING DESIGNATIONS	
PA-38	PRIMARY AGRICULTURE
RIPD	RURAL INDUSTRIAL - PLANNED DEVELOPMENT
AI	AIRPORT INDUSTRIAL
FA-19	FOREST/AGRICULTURE
SM	SURFACE MINING

LEGEND	
	CITY LIMITS
	AIRPORT PROPERTY LINE
	FUTURE AIRPORT PROPERTY LINE
	100YR FLOOD PLAIN
	500YR FLOOD PLAIN
	ZONING BOUNDARY
	AVIGATION EASEMENTS
	FUTURE AVIGATION EASEMENTS
	RUNWAY PROTECTION ZONE
	URBAN GROWTH
	NOISE CONTOURS

NOTE:

1. APPROACH AND DEPARTURE PATTERNS ARE PER THE CURRENT VERSION OF THE U.S. TERMINAL PROCEDURES FOR RUNWAY 15. RUNWAY 33 HAS A RIGHT TRAFFIC PATTERN.
2. NOISE CONTOURS ARE SHOWN FOR THE YEAR 2017. THESE CONTOURS WERE DEVELOPED BASED ON AIRCRAFT TRAFFIC FORECASTS FOR THE AIRPORT.
3. THE AREA ZONED FOR FISH AND WILDLIFE TO THE WEST AND NORTH OF THE AIRPORT MAYBE SUBJECT TO SECTION 303(C) OF TITLE 4a, U.S.C.
4. THE PROPERTY LINE SHOWN ON THIS DRAWING IS BASEON ON THE INFORMATION PROVIDED ON THE AIRPORT PROPERTY MAP, EXHIBIT "A".
5. A RECYCLING LANDFILL IS LOCATED WITHIN FIVE MILES OF THE AIRPORT. THIS LANDFILL IS NOT USED FOR SOLID WASTE.

LAND USE, ZONING, HEIGHT RESTRICTIONS, & ORDINANCES		
ORDINANCE NUMBER	DATE	DESCRIPTION
726	SEPTEMBER 16, 2002	CITY OF SCAPPOOSE - PUBLIC USE AIRPORT SAFETY AND COMPATIBILITY OVERLAY
ARTICLE VI, SECTION 1150	UNKNOWN	COLUMBIA COUNTY - AIRCRAFT LANDING FIELD OVERLAY

NOTE: CITY OF SCAPPOOSE ZONING MAP LAST REVISED ON APRIL 30, 1999.

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SHEET INFO	
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CHECKED	WR
APPROVED	REA
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PLOT DATE	6/17/2014
SUBMITTAL	

REVISIONS			
NO.	BY	DATE	REMARKS

LAND USE PLAN

PORT OF ST. HELENS
SCAPPOOSE INDUSTRIAL AIRPARK MASTER PLAN UPDATE

PROJECT NUMBER	DRAWING FILE NAME	SCALE
037610/0471W	037610-AIRP-LU01	AS NOTED

SHEET NUMBER
8

[DATE: 6/17/2014 11:33 AM] [AUTHOR: rtemplado] [PLOTTER: None] [STYLE: WHP-Standard.ctb]
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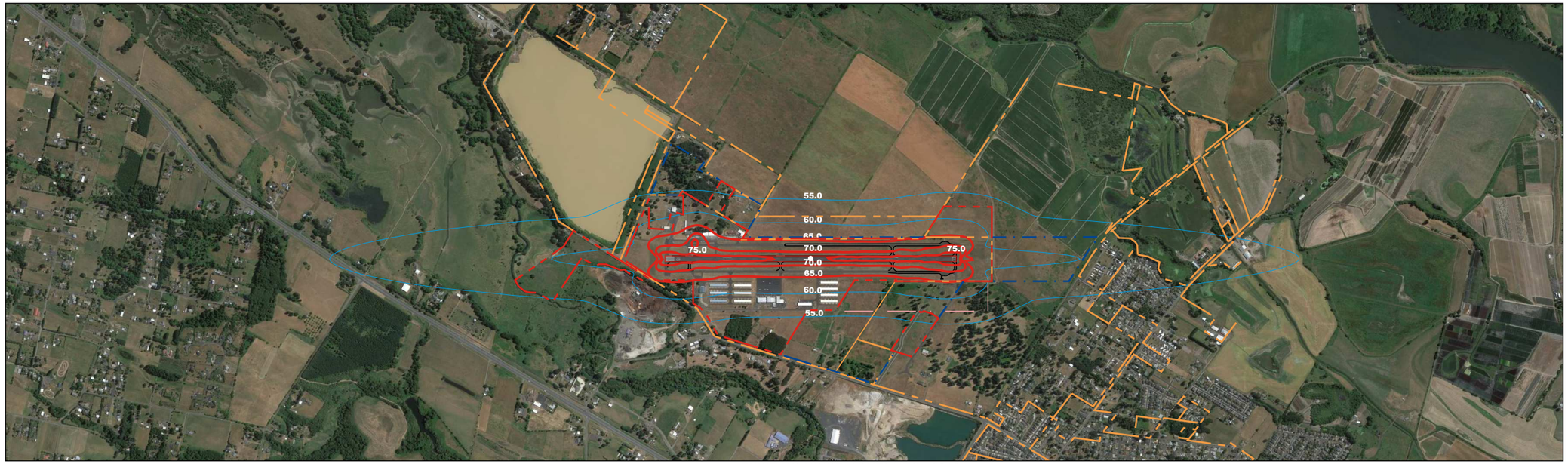
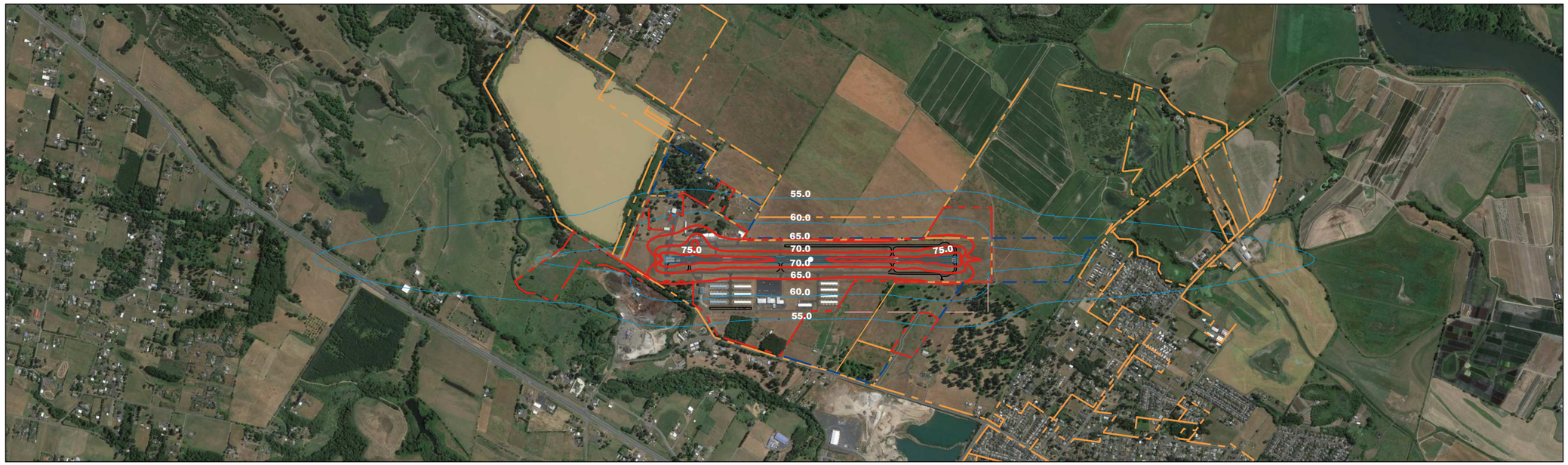


EXISTING NOISE CONTOURS - 2012

SCALE: HORIZONTAL 1"=1000'



ULTIMATE NOISE CONTOURS - 2017

SCALE: HORIZONTAL 1"=1000'

N

SCALE

1000 0 500 1000 2000

(FEET)

1 INCH = 1000 FT.

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AIRPORT NOISE CONTOURS

PORT OF ST. HELENS
SCAPPOOSE INDUSTRIAL AIRPARK MASTER PLAN UPDATE

PROJECT NUMBER	DRAWING FILE NAME	SCALE
037610/0471W	037610-AIRP-NC01	AS NOTED

SHEET NUMBER

9

[DATE: 5/13/2014 2:02 PM] [AUTHOR: rtemplado] [PLOTTER: None] [STYLE: WHP-Standard.ctb]
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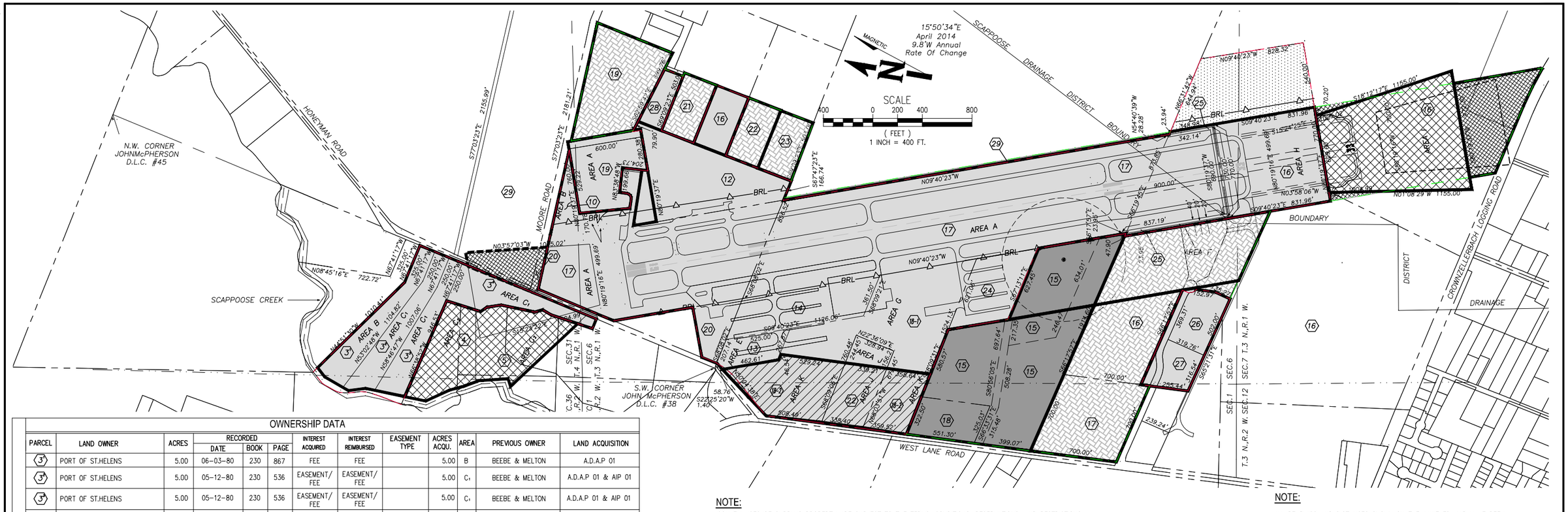

OWNERSHIP DATA

	PARCEL	LAND OWNER	ACRES	RECORDED DATE	RECORDED BOOK	RECORDED PAGE	INTEREST ACQUIRED	INTEREST REIMBURSED	EASEMENT TYPE	ACRES ACQU.	AREA	PREVIOUS OWNER	LAND ACQUISITION
PORT OF ST.HELENS FEE	3	PORT OF ST.HELENS	5.00	06-03-80	230	867	FEE	FEE		5.00	B	BEEBE & MELTON	A.D.A.P 01
	3	PORT OF ST.HELENS	5.00	05-12-80	230	536	EASEMENT/ FEE	EASEMENT/ FEE		5.00	C_1	BEEBE & MELTON	A.D.A.P 01 & AIP 01
	3	PORT OF ST.HELENS	5.00	05-12-80	230	536	EASEMENT/ FEE	EASEMENT/ FEE		5.00	C_4	BEEBE & MELTON	A.D.A.P 01 & AIP 01
	3	PORT OF ST.HELENS	5.00	05-12-80	230	539	EASEMENT/ FEE	EASEMENT/ FEE		5.00	C_3	BEEBE & MELTON	A.D.A.P 01 & AIP 01
	10	PORT OF ST.HELENS	2.20	08-23-78	219	615	FEE	FEE		2.20	B	GENE & EILEEN MCVICKER	A.D.A.P 01
	13	PORT OF ST.HELENS	2.70	09-20-78	F78	7274	FEE	FEE		2.70	E	ROBERT & SHERYL ADAMS	A.D.A.P 02
	14	PORT OF ST.HELENS	8.00	06-18-79	224	570	FEE	FEE		8.00	E	L.D. & THELMA CODY	A.D.A.P 02
	25	PORT OF ST.HELENS	0.89	05-13-81	237	15	FEE	FEE		0.89	F	ARBOR ROSE FARMS	A.D.A.P 02
	18-1	PORT OF ST.HELENS	15.94	01-04-77	215	922	FEE	FEE		15.94	G	DONALD & EMMA MEIER	A.D.A.P. 02
	18-2	PORT OF ST.HELENS	12.25	01-04-77	215	922	FEE	FEE		12.25	K	DONALD & EMMA MEIER	PORT FUNDING ONLY
	16	PORT OF ST.HELENS	14.71	11-10-82	CIR.	CT.	FEE	FEE		14.71	H&I	WAGNER RANCH	A.I.P. 3-41-0056-01
	22	PORT OF ST.HELENS	5.40	04-27-81	236	684	FEE	FEE		5.40	J	JEANNE FREDRICKS	PORT FUNDING ONLY
	12	PORT OF ST.HELENS	12.34	09-14-89	F89	5391	FEE	FEE		12.34	–	IRVIN & MARLEA LEFFLER	A.I.P. 3-42-0056-05
	16	PORT OF ST.HELENS	12.45	11-14-96	F96	11889	FEE	FEE		12.45	H&I	STANLEY WAGNER	A.I.P. 3-41-0056-08
	17	PORT OF ST.HELENS	80.43	10-30-72	189	13	FEE	N/A		80.43	A	COLUMBIA COUNTY	
	20	PORT OF ST.HELENS	2.85	06-04-76	206	676	FEE	N/A		2.85	–	COLUMBIA COUNTY	
	24	PORT OF ST.HELENS	6.00	02-12-91	F91	0759	FEE	N/A		6.00	–	ELIZABETH JOHNSON	
	26	PORT OF ST.HELENS	3.59	12-28-10			FEE	N/A		3.59	–	AERO INVEST. STRATEGIES	
	27	PORT OF ST.HELENS	2.29	12-28-10			FEE	N/A		2.29	–	AERO INVEST. STRATEGIES	
	28	PORT OF ST.HELENS	2.09	12-29-15	72	482	FEE	N/A		2.09	–	PATRICIA E. SHAFT	
PORT OF ST.HELENS EASEMENT	4	JAMES & BARBARA FISHER	7.13	11-21-78	220	970	EASEMENT	EASEMENT	AVIGATION	2.70	C_2		A.D.A.P. 01
	5	GEORGE DUGAN (TRUSTEE)	8.15	10-18-73	194	701	EASEMENT	EASEMENT	AVIGATION	4.20	C_2		A.D.A.P. 01
	16	AIRPARK DEVELOPMENT LLC	177.95	11-10-82	CIR.	CT.	EASEMENT	EASEMENT	AVIGATION	21.00	H&I		A.I.P. 3-41-0056-01
	16	AIRPARK DEVELOPMENT LLC	38.50	09-24-90	F90	5502	FEE	N/A		21.70	H&I		
PARCELS TO BE ACQUIRED	16	SPB HOLDINGS LLC	38.50	09-24-90	F90	5502	EASEMENT	N/A	AVIGATION	0.14	H&I		
	15	AIRPARK DEVELOPMENT LLC	34.52	07-01-93	F93	10730	FEE	N/A		8.73	F		
	29	AIRPARK DEVELOPMENT LLC	200.00	02-15-95	F95	01166	FEE	N/A		3.19	A		
	17	GLADYS FRANK & STEVEN YETT	10.38							10.38	A		
	18	ROSEMARY L. & DANIEL MOLONY	4.03							4.03	A		
PORT OF ST.HELENS PROPERTY SOLD	19	ELIZABETH K. JOHNSON	5.99	02-12-91	F91	0758	FEE	N/A		5.99	–	PORT OF ST.HELENS	

NOTE:

CONVEYANCES OF SURPLUS PROPERTY ARE SUBJECT TO THE TERMS, CONDITIONS, RESERVATIONS, AND RESTRICTIONS PRESCRIBED IN THE INSTRUMENTS OF CONVEYANCE. EACH CONVEYANCE OF REVENUE-PRODUCTION PROPERTY FEDERALLY OBLIGATES THE PUBLIC AGENCY RECIPIENT TO USE THE REVENUE GENERATED BY THE PROPERTY FOR THE OPERATION, MAINTENANCE, OR DEVELOPMENT OF THE AIRPORT. EACH INSTRUMENT OF CONVEYANCE OF SURPLUS PROPERTY FOR PUBLIC USE AIRPORT PURPOSES SETS FORTH THE PARTICULAR RIGHTS RETAINED BY THE FEDERAL GOVERNMENT AND THE SPECIFIC FEDERAL OBLIGATIONS ASSUMED BY THE AIRPORT SPONSOR FOLLOWING THE TRANSFER OF OWNERSHIP.

NOTE:

ALL BEARINGS AND DISTANCES SHOWN ON THE ANNEXED MAP HAVE BEEN ROTATED AND ADJUSTED TO FIT COUNTY SURVEY NUMBER 1946, BY HAGEDORN ON 2-28-82, AND MAY NOT AGREE WITH DEED DATA.

BASEMAP FOR PROPERTY INFORMATION PROVIDED BY DEWEY SURVEYING, INC.

AREA LETTER DESIGNATIONS HAVE BEEN RETAINED IN ORDER TO MATCH PREVIOUS FAA AND RECORD DOCUMENTATION. PARCEL 16 REFERENCE DUPLICATION IS TO BE RESOLVED IN COORDINATION WITH FAA.

LEGEND:

- EXISTING FEE OWNERSHIP (210.31 ACRES)
- EXISTING AVIGATION EASEMENT
- FEE OWNERSHIP TO BE ACQUIRED
- AVIGATION EASEMENT TO ACQUIRE
- AREA TO BE ACQUIRED IF AVAILABLE
- ACQUIRED BY PORT FUNDING ONLY
- AREA TO BE SURPLUSED OR TRADED
- EXISTING AIRPORT PROPERTY LINE (E)
- ULTIMATE AIRPORT PROPERTY LINE (U)
- PARCEL BOUNDARY
- RUNWAY CENTERLINE
- RUNWAY PROTECTION ZONE
- BUILDING RESTRICTION LINE (BRL)
- SECTION & DONATION LAND CLAIM LINES
- AREA TO BE ACQUIRED

OWNERSHIP DATA

	PARCEL	LAND OWNER	ACRES	RECORDED DATE	RECORDED BOOK	RECORDED PAGE	INTEREST ACQUIRED	INTEREST REIMBURSED	EASEMENT TYPE	ACRES ACQU.	AREA	PREVIOUS OWNER	LAND ACQUISITION
PARCELS TO BE ACQUIRED	19	HAVLIK JOHN & ETHEL M	10.86							10.86			
	21	VANCE DAVID M & JULIE	3.22							3.22			
	22	HARRIS KAREN M	3.22							3.22			
	23	LARSON KARYL M Y	3.22							3.22			

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REVISIONS			
NO.	BY	DATE	REMARKS

AIRPORT PROPERTY MAP
EXHIBIT "A"
PORT OF ST. HELENS
SCAPPOOSE INDUSTRIAL AIRPARK MASTER PLAN UPDATE

PROJECT NUMBER	DRAWING FILE NAME	SCALE
037610/0471W	037610-AIRP-PM01	AS NOTED

SHEET NUMBER: 10

[DATE: 3/3/2016 4:04 PM] [AUTHOR: jcools] [PLOTTER: DWG To PDF.pc3] [STYLE: WHP-Standard.ctb]
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Chapter Eight CAPITAL IMPROVEMENT PLAN

Scappoose Industrial Airpark Master Plan Update

This chapter presents the 20-year improvement program for the continued development of Scappoose Industrial Airpark. The objectives of this chapter are to identify projects deemed necessary to efficiently accommodate the forecast aviation demand, project the timeframe in which the projects should be accomplished, estimate the costs associated with each project, and identify potential funding sources for each.

Improvements that are required to satisfy the forecast aviation demand at Scappoose Industrial Airpark are placed into three development phases to represent the capital improvement plan (CIP):

- Short-term (through 2021)
- Intermediate-term (2022-2026)
- Long-term (2027-2036)

The following sections list the CIP projects by phase, provide a summary of the CIP with cost estimates, and address sources of funding for the CIP.

PROJECT LIST AND IMPLEMENTATION SCHEDULE

The list of capital improvement projects for Scappoose Industrial Airpark is coordinated with the Airport Layout Plan (ALP) drawing set and the capital improvement program that is continuously updated by the Port of St. Helens (POSH) and the Federal Aviation Administration (FAA).

Short-term projects are listed in order of priority along with the specific year in which the project is to be carried out. Intermediate- and long-term projects are also listed in order of priority but without year designators. Projects that were included in the ALP but are anticipated to take place beyond the 20-year planning period are identified without cost estimates. Furthermore, it is anticipated that the project phasing will invariably alter as local and federal priorities evolve over the coming months and years.

The projects, phasing, and costs presented in this chapter are the best projections at the time of the master planning effort. The purpose is to provide a reasonable projection of capital needs, which can then be used in fiscal programming to test for financial feasibility.

This implementation plan is appropriately and realistically designed to represent the Airport's best opportunity to meet its potential. However, the plan also represents a series of choices and alternatives for the Airport. The ultimate success of Scappoose Industrial Airpark does not rely upon the completion of each and every capital item programmed in the CIP. To meet realistic funding expectations, it may be necessary to weigh the items of the development plan in a thoughtful and global manner.

Here, descriptions of the proposed CIP projects are presented for the Airport by phase, which are followed by **Table 8A** summarizing the projects and their cost estimates.

PHASE I (2016-2021)

Phase I represents the highest priority projects through 2021. Phase I development projects are broken down into specific years. Projects in this phase include:

Pavement Maintenance Program (2016). The PMP operates on a three-year cycle. Specific pavement maintenance work will include crack sealing, AC patching, surface sealants and repair striping.

Taxiway B Relocation – Environmental Assessment/Preliminary Design (2016). This project includes the review of potential environmental impacts associated with the proposed 15-foot relocation of a portion of Taxiway B to meet the FAA taxiway-centerline-to-runway-centerline dimension of 240 feet from its present non-standard 225-foot separation.

Taxiway B Relocation, Connector Taxiway Realignment, and MITL – Design Phase (2017). A 4,000-foot portion of Taxiway B from the north end to Taxiway B5 will be relocated 15 feet to the west to meet the FAA recommendation of a taxiway centerline to runway centerline of 240 feet. Three connector taxiways will be removed and two new connectors reconstructed to realign access to the runway; this realignment eliminates the direct access that currently exists from the aircraft parking apron to the runway. Connector realignment follows FAA guidance to reduce runway incursions. As part of this project, a medium intensity taxiway lighting (MITL) system will also be installed on the west side taxiway system.

Taxiway B Relocation (Construction) and AGIS Survey (2018). This project includes the construction/relocation of Taxiway B, removal of three connector taxiways, construction of two new connector taxiways, lighted sign relocation, edge drain system, and a new taxiway edge lighting system. This project will also include an AGIS Obstruction Survey as per FAA guidelines.

Pavement Maintenance Program (2019). The PMP operates on a three-year cycle. Specific pavement maintenance work will include crack sealing, AC patching, surface sealants and repair striping.

Land Acquisition (2020). Approximately 25 acres should be acquired in fee simple and avigation easement to accommodate the proposed long-term 900-foot extension and POSH's control of the property within the future RPZ. A portion of the cost should be funded by a 13-acre parcel trade with Airpark Development. The 13-acre airport parcel is located on the east side near the Runway 33 end where Airpark Development owns the adjacent property. A small corner of the RPZ with an estimated .03 acres overlays the Crown Z Road and will require an avigation easement (or a slight reduction of the proposed extension to keep the RPZ off the roadway). If fee simple acquisition of other portions of the RPZ is impractical, POSH should control those other areas with avigation easements.

Land Acquisition (2021). This land acquisition will include any parcels identified in the ALP – Exhibit "A" which may become available in the short-term planning period.

PHASE II (2022-2026)

Phase II includes the next five years of the planning period, 2022-2026, as follows:

Hangar Development Skyway Drive – POSH. New hangar construction is proposed on an existing ground area previously prepared with taxiway access that lies adjacent to and parallel with Skyway Drive and west of the existing six banks of T-hangars. This new hangar will serve the majority of projected based aircraft in the near- to intermediate term of the master planning window.

Land Acquisition – Westside 30 acres. Approximately 30 acres to the west of the runway owned by Airpark Development is to be acquired in fee simple. This acquisition will support POSH's proposed

two-way taxiway access to their hangar development expansion area, a new ASOS location, and future/long-term airport development.

Apron Expansion – Phase I. Additional aircraft parking apron is needed adjacent to the FBO on the east side. The first phase of the apron expansion is located on the north side of Airport Road and contains an estimated 7,100 square yards. This development requires the removal of the old shed hangar that is presently located there; this hangar is in poor condition. This project also includes the extension of water from Skyway Drive to the apron development area, which is an estimated 1,800 linear feet.

Westside Development – Environmental Assessment. This project includes the review of potential environmental impacts associated with the proposed Westside development as identified in the preferred alternative—hangars, taxilanes, ASOS relocation, and associated utility infrastructure.

Westside Development – Design Phase. This project includes the design of the proposed Westside utility, taxilane, and roadway improvements to serve the future hangar development area. Water and sanitary sewer lines will be extended to serve the area. The roadway design improvements include modifications to Skyway Drive and the access from West Lane.

ASOS Relocation. The ASOS equipment will be relocated to its new location south of its current location to allow for the development of the two-way taxilane serving the proposed hangar development area.

Westside Development – Construction Phase for Utilities. This project includes the construction of the proposed Westside waterline and sanitary sewer extensions to serve the Westside development area.

Westside Development – Construction Phase for Taxilanes. Construction of the proposed taxilanes that provide access to the Westside development in included in this project. Extension of electrical utilities to the future hangar sites as well as drainage improvements is also included.

Westside Development – Construction Phase for Access Road. This project includes the construction of the proposed access road to the new Westside taxilanes to provide access to the Westside development. This project includes the extension of electrical utilities to the future hangar sites as well as drainage improvements.

Hangar Development – Phase I Westside – POSH. This project includes the construction of a bank of T-hangars with nearly 24,000 square feet to accommodate the projected increase in based aircraft (Group I small).

Hangar Development – Phase I Westside – Private. This project includes the construction of four large conventional/box hangars by a private developer on ground lease lots to serve the projected increase in based aircraft (Group I small) that prefer conventional hangars in lieu of T-hangar units.

Pavement Maintenance Program. This project is a part of the ongoing PMP, which operates on a three-year cycle so anticipated work will occur in 2019 and 2022. Work will include crack sealing, AC patching, surface sealants and repair striping.

Taxiway A MITL Installation (Design and Construction). This project includes the installation of a medium intensity taxiway lighting (MITL) system on the east side for Taxiway A, similar to the system previously identified for Taxiway B.

Land Acquisition – Linear Property to the East. Approximately 1.8 acres to the east of the airfield is to be acquired from Airpark Development to provide the necessary setbacks from the airside facilities.

PHASE III (2027-2036)

Phase III is the last ten years of the planning period, 2023-2032. Specific years for these projects were not identified as any projection would be speculative. Projects falling within this timeframe include:

Apron Expansion – Phase II. This project provides additional apron on the east side of the airport near the FBO and south of Airport Road. Additional aircraft parking apron will be needed as transient aircraft activity and the based aircraft count grows. The proposed apron is an estimated 24,800 square yards to serve long-term demand and consists of tiedown area and circulation.

Airport Master Plan Update. This project includes an update to this Airport Master Plan. A review and update of existing conditions at the Airport will be completed. In addition, aviation demand forecasts (based on aviation and socioeconomic changes and trends) will be updated. Facility needs based on the updated forecasts will be prepared to determine if changes to future development plans are necessary.

Hangar Development – Phase II Westside – Port. This project includes the continued construction of T-hangars in the new Westside hangar development area to accommodate the projected increase in based aircraft (Group I small).

Hangar Development – Phase II Westside – Private. This project includes the construction of additional large conventional/box hangars by a private developer on ground lease lots to serve the projected increase in based aircraft (Group I small) that prefer conventional hangars in lieu of T-hangar units.

Pavement Maintenance Program. As part of the ongoing PMP, this project operates on a three-year cycle so anticipated work will occur in 2025, 2028, and 2031. Work will include crack sealing, AC patching, surface sealants and repair striping.

New Apron. This project provides additional apron on the southwest side of the airfield to serve corporate aviation users in the long-term including FBO facilities. With POSH's interest in promoting economic growth in the area, attracting and serving the growing corporate aviation market segment will require additional facilities. While this project is proposed for the end of the 20-year planning period, its actual development will be demand-driven and will also depend on the progress of the Scappoose Airport Business Center development on the east side of the Airport. The Scappoose Airport Business Center anticipates providing corporate aviation facilities with TTF access.

Helicopter Parking Area. This project is located just south of the proposed new apron for corporate aviation. Growing helicopter operations and the need to separate such operations from increased fixed wing activity will drive the need for these facilities.

PHASE IV (BEYOND THE 20-YEAR PLANNING PERIOD)

Phase IV represents projects that are included on the ALP and are part of POSH's vision for the long term development for the Airport. These projects are not anticipated to be needed or justified within the 20-year planning period and are, therefore, not included in the CIP and cost estimates. However, they are identified on the ALP for long-term planning purposes. These projects include:

Runway Length Justification Report. A runway extension of 900 feet is presented in the Airport Layout Plan. However, at this time there are not enough constrained operations to justify FAA funding. It is anticipated sometime beyond the 20-year planning period an extension may be justified. The preparation of a study will be required to provide the necessary justification to the FAA to open up funding opportunities. At a minimum, this study will be required to address the runway extension, but another master plan update may also be needed.

Runway Extension EA. An EA would be necessary prior to extending Runway 33, to identify and evaluate potential environmental impacts.

Extend Runway (900'). Extend Runway 33 a total of 900 feet to the north to allow for a larger range of aircraft operations. The parallel taxiways A and B would also be extended south as part of runway extension. Additionally, the MIRL lighting system would be extended along the new runway section and the REIL system would be relocated to the new end of Runway 33.

Table 8A. Scappoose Industrial Airpark Capital Improvement Plan (CIP) in 2014 Dollars

Scappoose Industrial Airport (SPB) Capital Improvement Plan (CIP) Estimates									
Year/ Priority	Project Description	Total Cost	Port of St. Helens	FAA		ODA	Private	Other	Other Description
				Non-Primary Entitlement	State Apportion/ Discretionary				
Phase I (2016 - 2021)									
2016	Pavement Maintenance Program	$ 5,556	$ 556	$ 5,000					
2016	Taxiway B Relocation - Environmental/Prelim Design	$ 200,000	$ 20,000	$ 180,000					
2017	Taxiway B Relocation - Design	$ 300,000	$ 30,000	$ 270,000					
2018	Taxiway B Relocation (Construction) and AGIS Survey	$ 3,050,000	$ 305,000	$ 320,990	$ 2,424,010				
2019	Pavement Maintenance Program	$ 5,556	$ 556	$ 5,000					
2020	Land Acquisition	$ 327,778	$ 32,778	$ 295,000					
2021	Land Acquisition	$ 166,667	$ 16,667	$ 150,000					
	Phase I Totals	$ 4,055,557	$ 405,556	$ 1,225,991	$ 2,424,010	$ -	$ -	$ -	
Phase II (2022-2026)									
1	Hangar Development Skyway Dr - Port	$ 1,609,000	$ 1,609,000						
2	Land Acquisition - Westside 30 Acres	$ 1,140,000	$ 114,000	$ 150,000	$ 876,000				
3	Apron Expansion - Phase I	$ 649,000	$ 64,900		$ 584,100				
4	Westside Development - Environmental Assessment	$ 60,000	$ 6,000		$ 54,000				
5	Westside Development - Design Phase	$ 398,000	$ 39,800	$ 150,000	$ 208,200				
6	ASOS Relocation	$ 70,000	$ 7,000		$ 63,000				
7	Westside Development - Construction Phase - Utilities	$ 735,000	$ 73,500		$ 661,500				
8	Westside Development - Construction Phase - Taxilanes	$ 1,168,000	$ 116,800	$ 150,000	$ 901,200				
9	Westside Development - Construction Phase - Access Road	$ 750,000	$ 75,000	$ 150,000	$ 525,000				
10	Hangar Development Ph I Westside - Port	$ 1,601,000	$ 1,601,000		$ -				
11	Hangar Development Ph I Westside - Private	$ 1,593,000					$ 1,593,000		
12	Pavement Maintenance Program (2019 & 2022)	$ 150,000			$ 37,500	$ 112,500			
13	Taxiway A MITL installation (Design & Construction)	$ 589,000	$ 58,900	$ 150,000	$ 380,100				
14	Land Acquisition/Easement of Linear Property to the East	$ 246,000	$ 24,600		$ 221,400				
	Phase II Totals	$ 10,758,000	$ 3,790,500	$ 750,000	$ 4,512,000	$ 112,500	$ 1,593,000	$ -	
Phase III (2027-2036)									
1	Apron Expansion - Phase II	$ 1,407,000	$ 140,700	$ 300,000	$ 966,300				
2	Airport Master Plan Update	$ 250,000	$ 25,000	$ 225,000	$ -				
3	Hangar Development Ph II Westside - Port	$ 1,593,000	$ 1,593,000	$ 150,000					
4	Hangar Development Ph II Westside - Private	$ 1,146,000					$ 1,146,000		
5	Pavement Maintenance Program (2025, 2028, 2031)	$ 336,000		$ 84,000		$ 252,000			
6	New Apron on Southwest side (Design & Construction)	$ 1,551,000	$ 155,100	$ 591,000	$ 804,900				
7	Helicopter Parking Area (Design & Construction)	$ 1,134,000	$ 113,400	$ 150,000	$ 870,600				
	Phase III Totals	$ 7,417,000	$ 2,027,200	$ 1,500,000	$ 2,641,800	$ 252,000	$ 1,146,000	$ -	
	Total All Phases	$ 22,230,557	$ 6,223,256	$ 3,475,991	$ 9,577,810	$ 364,500	$ 2,739,000	$ -	

Source: Port of St. Helens and WHPacific.

COST ESTIMATES

Cost estimates for individual projects listed in Table 8A are based on 2014 dollars. The estimates include the total cost for each project, the Port of St. Helens' share, and that part of the total cost eligible for and anticipated to be paid by the FAA under the Airport Improvement Program (AIP) or similar program.

In addition to airport sponsor funds, the local share can include sources such as Oregon Department of Aviation (ODA) funding, State and/or local economic development funds, regional commissions and organizations, other units of local government, as well as funding from private individuals or businesses. Examples of factors influencing the CIP phasing and associated cost estimates may include operational constraints, project schedule, utility locations, and other special project requirements. That being said, these estimates are intended to be used for planning purposes only and should not be construed as detailed construction cost estimates, which can only be compiled following the preparation of detailed design documentation. It should be noted that total project costs generally include construction, temporary flagging and signing, construction staking, testing, engineering, administration, and contingency, as required.

SOURCES OF CAPITAL FUNDING

The following section provides a description of capital improvement funding sources that are listed in **Table 8A**.

FEDERAL FUNDING

Federal funding available for eligible Scappoose Industrial Airpark projects is described below.

FEDERAL AIP ENTITLEMENT GRANTS

The current program, known as the Airport Improvement Program (AIP), was established by the Airport and Airway Improvement Act of 1982 (Public Law 97-248). Since then, the AIP has been amended several times, most recently with the passage of the FAA Modernization and Reform Act of 2012. Funds obligated for the AIP are drawn from the Airport and Airway Trust fund, which is supported by user fees, fuel taxes, and other similar revenue sources. For large and medium primary hub airports, the grant covers 75 percent of eligible costs (or 80 percent for noise program

implementation). For small primary, reliever, and general aviation airports, the grant covers a range of 90-95 percent of eligible costs, based on statutory requirements.

The Wendell H. Ford Aviation Investment and Reform Act for the 21st Century (AIR-21), enacted in April 2000, established the first-ever Non-Primary Airports Entitlement Program. AIR-21 sets aside grant funding for general aviation airports listed in the National Plan of Integrated Airport Systems (NPIAS) for pavement maintenance work. General aviation airports can each receive up to $150,000 per year based on the FAA's assessment of maintenance needs over a five-year period.

This funding set-aside is available for each federal fiscal year when Congress appropriates at least $3.2 billion for the FAA's AIP grant program. For the convenience of the Airport Sponsor, if a project is anticipated to cost in excess of $150,000, participating airports can roll over the Non-Primary Entitlement funds to accumulate funds for larger projects up to four years. However, there are arranged groups of airports today that transfer their funds within the arranged group each funding year so each airport takes a turn with the transferred funds to accomplish larger projects. The FAA has indicated that there are several advantages to this approach to include less grants on the books to manage for the sponsor and FAA, a cost savings on closeout reports over the typical four-year rollover period, more attention and consideration in the CIP development, and the maximized use of AIP dollars. Possible challenges encountered with this approach include coordination within the arranged group, possible emergency projects, and long-term funding uncertainties.

FEDERAL AIP DISCRETIONARY GRANTS

The FAA also provides discretionary grants on a 90/10% basis to airports similar to Scappoose Industrial Airpark. This source of funding is over and above entitlement funding and is provided to airports for projects that have a high federal priority for enhancing airport safety, security, and capacity and would be difficult to fund otherwise. The dollar amounts of individual grants vary and can be significant in comparison to entitlement funding. The FAA determines which projects will be awarded discretionary grants. Discretionary grant applications are evaluated based on need, the FAA's project priority ranking system, and the FAA's assessment of a project's significance within the national airport and airway system.

STATE FUNDING

CONNECTOREGON

In 2005, the Oregon Legislature authorized funding for air, marine, rail, and transit infrastructure, known as ConnectOregon. The purpose of this program is to improve commerce, reduce delay, and enhance safety for the state's multi-modal transportation system. In July 2014, the Oregon

Legislature approved $42 million in funding for a fifth installment of the multimodal ConnectOregon program, bringing the total program allocation to $382 million since its beginning. In addition to the traditionally funded rail, port/marine, transit and aviation projects, the legislature added bicycle and pedestrian projects, but only those projects deemed ineligible for State Highway Funds may compete for ConnectOregon funding.

Currently, there are two grant types available for airports under the ConnectOregon program, one that matches up to 80% of a project and another that matches the 5% local amount needed for FAA AIP projects.

According to published reports, ConnectOregon V applications included 28 for aviation of the 106 total received for various transportation modes. In the past, 26 percent of ConnectOregon funding went to aviation projects.

PAVEMENT MAINTENANCE PROGRAM (PMP)

This program was developed by the Oregon Department of Aviation to protect Oregon's airport investments by preserving airport pavement. The PMP provides airports the opportunity to complete preventative maintenance which extends the life of pavement and ultimately reduces costs to airport sponsors, the state, and the federal government.

PRIVATE FUNDING

Many airports use private third-party financing when the planned improvements will be primarily used by a private business or other organization. Such projects are not ordinarily eligible for federal funding. Projects of this kind typically include hangars, fixed base operator (FBO) facilities, fuel storage, exclusive aircraft parking aprons, industrial aviation-use facilities, non-aviation office/commercial/industrial developments, and various other projects. Private development proposals are considered on a case-by-case basis. Often, airport funds for infrastructure, preliminary site work, and site access are required to facilitate privately developed projects on airport property.

SPONSOR FUNDING

Airport sponsor funding is typically obtained either through revenues generated at the airport or from other revenue sources available to the sponsor. In order to determine the ability of POSH to support its financial needs related to future capital development, the Airport's revenues and expenses of the Airport are reviewed.

HISTORICAL REVENUES AND EXPENSES

Airport revenues are typically generated through user fees. User fees, which are most often established relative to area market conditions, include charges for the airport facilities and services provided. The primary sources of airport operating revenues at Scappoose Industrial Airpark include commercial leases/fees hangar rentals.

Consequently, based aircraft, aviation activity levels, and landside development are the primary factors affecting airport operating revenues at Scappoose. As additional development occurs to serve an increase in based aircraft and aviation business tenant activity, airport leases are updated and operating revenues correspondingly increase. The Port is not presently collecting fuel flowage fees.

Airport operating revenues are offset by operating expenses and referred to as operation and maintenance (O&M) costs. These costs represent the day-to-day costs of operating the Airport. The Port tracks the following O&M costs for Scappoose Industrial Airpark:

- Maintenance and repair
- Marketing, advertising/publishing
- Utilities
- Legal fees
- Contracted services, Professional services
- Insurance, Property taxes
- Other fees, miscellaneous expenses

Historical operating revenues and expenses for the Airport over the last five fiscal years are presented in **Table 8B**.

As Table 8B indicates, POSH has a positive cash flow. However, these figures do not include cost allocations for services provided and infrastructure development. The Port does not track salaries, wages, and employee benefits associated with the O&M for the Airport. Further, net operating revenues support POSH's contribution toward CIP projects at the Airport.

Table 8B. Historical Revenues and Expenses

Revenues	2009	2010	2011	2012	2013
Commercial Leases/Fees	$ 228,368	$ 234,906	$ 247,598	$ 257,528	$ 281,406
Reimbursements Insur, Misc	$ -	$ 9,914	$ 10,497	$ 11,117	$ 13,941
Hangar Rentals	$ 237,239	$ 249,757	$ 254,545	$ 252,301	$ 256,571
Miscellaneous	$ 150	$ 670	$ 645	$ 219	$ 490
Total Revenues	**$ 465,757**	**$ 495,247**	**$ 513,285**	**$ 521,164**	**$ 552,407**
Expenses					
Maintenance and repair	$ 8,092	$ 6,727	$ 8,844	$ 7,118	$ 8,983
Marketing, advertising	$ 1,049	$ 944	$ 823	$ 2,875	$ 372
Utilities	$ 14,316	$ 16,587	$ 18,492	$ 18,099	$ 14,653
Legal fees	$ 27,466	$ 2,175	$ 2,884	$ 7,640	$ 6,200
Contracted & Prof Services	$ 32,747	$ 29,615	$ 29,086	$ 18,287	$ 25,255
Insurance, property taxes	$ 13,450	$ 24,527	$ 31,412	$ 33,780	$ 35,897
Other fees, misc. expenses	$ -	$ 3,830	$ 30	$ 97	$ 442
Total Expenses	**$ 97,121**	**$ 84,405**	**$ 91,571**	**$ 87,896**	**$ 91,802**
Cash Flow	**$368,636**	**$410,842**	**$421,714**	**$433,268**	**$460,606**

Source: Port of St Helens. Note: Figures rounded.

PROJECTED REVENUES AND EXPENSES

The ongoing economic recovery and anticipated gradual recovery of general aviation suggest that the Scappoose Industrial Airpark will see continued growth in airport activity translating to new tenants and facility development, which will affect the Airport's revenues and expenses over the planning period.

Numerous factors will influence the Airport's financial picture, but consideration of the Airport's recent budget and financial history as well as projected airport activity provide the framework for the projected revenues and expenses. To establish the baseline figure, revenues and expenses were reviewed to determine whether there is a steady increase to support this continuing trend or if fluctuations have historically occurred. Fluctuating figures are averaged for the last three years to establish the baseline. The estimated revenues and expenses are for planning purposes.

Table 8C presents the projected revenues and expenses for the planning period.

Table 8C. Projected Revenues and Expenses

Revenues	Baseline	2017	2022	2032
Commercial Leases/Fees	281,410	316,700	367,200	493,500
Hangar Rentals	256,570	267,000	287,600	350,600
Misc (Reimb, etc)	14,400	16,500	19,600	26,400
Total Revenues	$ 552,380	$ 600,200	$ 674,400	$ 870,500
Expenses	**Baseline**	**2017**	**2022**	**2032**
Maintenance and repair	9,000	10,900	13,300	19,700
Other Fees, Marketing, Advertising, Misc	1,800	2,000	2,200	2,900
Utilities	17,100	18,100	20,300	27,300
Contracted & Prof Services, Legal Fees	29,800	31,000	33,400	40,700
Insurance, property taxes	35,900	41,200	49,500	73,300
Total Expenses	$ 93,600	$ 103,200	$ 118,700	$ 163,900
Cash Flow	$ 458,780	$ 497,000	$ 555,700	$ 706,600

Source: Baseline data formulated from Table 8B (based on recent figures and/or average). Other figures are WHPacific projections.

As shown, cash flow is projected to grow in the coming years with annual revenues exceeding $870,000 and annual expenses reaching nearly $164,000 during the planning period. It's important to note that a variety of factors and assumptions form the basis for projections. While it's clearly difficult to make predictions with accuracy, the projections prepared for the Airport take into account recent activity and tenant growth trends and projections as well as recent airport financial results. The growth factors applied consider the unique characteristics of Scappoose Industrial Airpark, particularly with revenues associated with commercial leases, fees, and hangar rentals, which have shown overall growth and are projected to increase with forecast demand and POSH's development plans. Concurrently, operating expenses are anticipated to increase as airport operations grow and airport facility improvements are completed. However, a slightly stronger rate of increase in expenses versus revenues is projected to reflect the considerable increase in insurance as well as recent increase in maintenance and repair costs. Further, this provides a more financially conservative approach to projecting revenues as new development and tenants may increase O&M expenses before the financial benefits are fully realized in the more distant future. Consequently, by the end of the planning period, expenses are anticipated to reach 19% of revenues—slightly up from the estimated 17% figure today, before revenues return to a more equal and higher rate of growth than expenses. Nevertheless, total annual revenues will remain well above total annual expenses for the planning period.

In order to assess the Airport's financial situation over the 20-year planning period, cash flow by phase is compared to the CIP funding needs for the same timeframe. As a result, POSH is provided with an overview of their financial responsibility for capital improvements beyond the FAA and State funding resources (**Table 8D**). Since POSH is responsible for coordinating or securing funds for grant matches, AIP-ineligible projects, private development, and other possible agency grant funding sources, these are combined and referred to as local/other.

Table 8D. Cash Flow vs. Local/Other CIP Funding Requirements

Revenues	Revenues by Phase	Expenses by Phase	Projected Cash Flow/ Net Income by Phase	CIP - Local/ Other Funding*	Net Difference
Phase I (2014-2017)	2,327,600	398,200	1,929,400	1,864,200	65,200
Phase II (2018-2022)	3,219,900	561,800	2,658,100	3,774,500	(1,116,400)
Phase III (2023-2032)	7,779,600	1,423,100	6,356,500	3,173,200	3,183,300
Total	$ 13,327,100	$ 2,383,100	$ 10,944,000	$ 8,811,900	$ 2,132,100

Source: Revenue and Expense Projections and Table 8C. Figures rounded.
**Of the $8.8 million shown, private/other funding anticipated is $2.7 million with $6.1 million balance for POSH funding.*

As shown, the $10.9 million projected cash flow covers the $8.8 million in funding required for the local/share with a $2.1 million remaining balance. However, POSH anticipates $2.7 million in private or other funding, which contributes to a higher net balance for POSH. Further, $1.6 million of the private funding is anticipated for Phase II development projects, which fully covers the funding shortage shown for Phase II in Table 8D.

OTHER FUNDING

It's important to note that while the large majority of proposed projects are eligible for AIP funds, FAA's priority ranking of projects and limited funding may result in project funding delays. In such cases, POSH may await FAA funding for needed improvements or consider other funding options just as they might for AIP-ineligible projects. Historically, airport sponsors have pursued a number of other funding sources such as general obligation bonds, revenue bonds, special legislative appropriations, and loan programs that provide access and flexibility to funding. For POSH, the projected positive cash flow, FAA high priority airport improvements, and anticipated private funding will serve the Airport's CIP needs well.

SUMMARY

This Airport Master Plan Update included a comprehensive study of the Scappoose Industrial Airpark's needs to meet aviation demand. Successful implementation of the plan will require POSH use the plan to guide future development of the Airport while remaining flexible when unforeseen changes occur. The fundamental information included in the plan will help POSH monitor and respond to such unforeseen changes in activity and facility needs. While some changes may be easily addressed with an updated CIP, more substantial changes at the Airport, in the region, and/or in the aviation industry, may prompt the need for an airport master planning update.

DEFINITIONS

ABOVE GROUND LEVEL. The elevation of a point or surface above the ground.

ACCELERATE – STOP DISTANCE AVAILABLE (ASDA). See declared distances

ADVISORY CIRCULAR. External publication issued by the FAA consisting of non-regulatory material providing for the recommendations relative to a policy, guidance and information relative to a specific aviation subject.

AIR CARRIER. An operator, which: (1) performs at least five round trips per week between two or more points and publishes flight schedules which specifies the times, days of the week, and places between which such flights are performed; or (2) transport mail by air pursuant to a current contract with the U.S. Postal Service. Certified in accordance with Federal Aviation Regulation (FAR) Parts 121 and 127.

AIR ROUTE TRAFFIC CONTROL CENTER (ARTCC). A facility established to provide air traffic control service to an aircraft operating on an IFR flight plan within controlled airspace and principally during the enroute phase of flight.

AIR TAXI. An air carrier certificated in accordance with FAR Part 135 and authorized to provide, on demand, public transportation of persons and property by aircraft. Generally operates small aircraft for hire for specific trips.

AIR TRAFFIC CONTROL FACILITIES (ATC-F). Electronic equipment and buildings aiding air traffic control (ATC) - for communications, surveillance of aircraft including weather detection and advisory systems.

AIRCRAFT. An aircraft is a device that is used or intended to be used for flight in the air.

AIRCRAFT APPROACH CATEGORY. A grouping of aircraft based on 1.3 times the stall speed in their maximum certificated landing weight. The categories are as follows:

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

AIRCRAFT OPERATION. The landing, takeoff, or touch-and-go procedure by an aircraft on a runway at an airport.

AIRCRAFT OPERATIONS AREA (AOA). A restricted and secure area on the airport property designed to protect all aspects related to aircraft operations.

AIRFIELD. The portion of an airport which contains the facilities necessary for the operation of aircraft.

AIRPLANE. An engine-driven fixed-wing aircraft heavier than air that is supported in flight by the dynamic reaction of the air against its wings.

AIRPLANE DESIGN GROUP (ADG). A grouping of aircraft based upon relative wingspan or tail height (whichever is most demanding). The groups are as follows:

Group	Tail Height (ft.)	Wingspan (ft.)
1	<20	<49
II	20 - <30	49 - <79
III	30 - <45	79 - <118
IV	45 - <60	118 - <171
V	60 - <66	171 - <214
VI	66 - <80	214 - <262

AIRPORT. An airport is an area of land or water that is used or intended to be used for the landing and takeoff of aircraft, and includes its buildings and facilities, if any.

AIRPORT BEACON. A navigational aid located at an airport which displays a rotating light beam to identify whether an airport is lighted.

AIRPORT ELEVATION. The highest point on an airport's usable runway expressed in feet above mean sea level (MSL).

AIRPORT IMPROVEMENT PROGRAM. A program authorized by the Airport and Airway Improvement Act of 1982 that provides funding for airport planning and development.

AIRPORT LAYOUT DRAWING (ALD). The drawing of the airport showing the layout of existing and proposed airport facilities.

AIRPORT LAYOUT PLAN (ALP). A scaled drawing of the existing and planned land and facilities necessary for the operation and development of the airport.

AIRPORT LAYOUT PLAN DRAWING SET. A set of technical drawings depicting the current and future airport conditions. The FAA required drawings include the Airport Layout Plan, the Airport Airspace Drawing, and the Inner Portion of the Approach Surface Drawing, On-Airport Land Use Drawing, and Property Map.

AIRPORT MOVEMENT AREA SAFETY SYSTEM. A system that provides automated alerts and warnings of potential runway incursions or other hazardous aircraft movement events.

AIRPORT OBSTRUCTION CHART. A scaled drawing depicting the Federal Aviation Regulation (FAR) Part 77 surfaces, a representation of objects that penetrate these surfaces, runway, taxiway and ramp areas, navigational aids, buildings, roads and other details in the vicinity of the airport.

AIRPORT REFERENCE CODE (ARC). A coding system used to relate airport design criteria to the operational (Aircraft Approach Category) to the physical characteristics (Airplane Design Group) of the airplanes intended to operate at the airport.

AIRPORT REFERENCE POINT (ARP). The latitude and longitude of the approximate center of the airport.

AIRPORT TRAFFIC CONTROL TOWER (ATCT). A central operations facility in the terminal air traffic control system, consisting of a tower, including an associated instrument flight rule (IFR) room if radar equipped, using air/ground communications and/or radar, visual signaling, and other devices to provide safe and expeditious movement of terminal air traffic.

AIRSIDE. The portion of an airport that contains facilities necessary for the operation of aircraft.

AIRSPACE. The volume of space above the surface of the ground that is provided for the operation of aircraft.

ALERT AREA. See special-use airspace.

ALTITUDE. The vertical distance measured in feet above mean sea level.

ALIGNED TAXIWAY. A taxiway with its centerline aligned with a runway centerline. Sometimes referred to as an "inline taxiway."

APPROACH PROCEDURE WITH VERTICAL GUIDANCE (APV). An Instrument Approach Procedure (IAP) providing both vertical and lateral electronic guidance.

ANNUAL INSTRUMENT APPROACH (AIA). An approach to an airport with the intent to land by an aircraft in accordance with an IFR flight plan when visibility is less than three miles and/or when the ceiling is at or below the minimum initial approach altitude.

APPROACH LIGHTING SYSTEM (ALS). An airport lighting facility, which provides visual guidance to landing aircraft by radiating light beams by which the pilot aligns the aircraft with the extended centerline of the runway on his/her final approach and landing.

APPROACH MINIMUMS. The altitude below which an aircraft may not descend while on an IFR approach unless the pilot has the runway in sight.

APPROACH SURFACE. An imaginary obstruction limiting surface defined in FAR Part 77 which is longitudinally centered on an extended runway centerline and extends outward and upward from the primary surface at each end of a runway at a designated slope and distance based upon the type of available or planned approach by aircraft to a runway.

APPROACH SURFACE BASELINE (ASBL). A horizontal line tangent to the surface of the earth at the runway threshold aligned with the final approach course.

APRON. A specified portion of the airfield used for passenger, cargo or freight loading and unloading, aircraft parking, and the refueling, maintenance and servicing of aircraft.

AREA NAVIGATION. The air navigation procedure that provides the capability to establish and maintain a flight path on an arbitrary course that remains within the coverage area of navigational sources being used.

AUTOMATIC DIRECTION FINDER (ADF). An aircraft radio navigation system, which senses and indicates the direction to a non-directional radio beacon (NDB) ground transmitter.

AUTOMATED SURFACE OBSERVATION SYSTEM (ASOS). A reporting system that provides frequent airport ground surface weather observation data through digitized voice broadcasts and printed reports.

AUTOMATED WEATHER OBSERVATION STATION (AWOS). Equipment used to automatically record weather conditions (i.e. cloud height, visibility, wind speed and direction, temperature, dew-point, etc.).

AUTOMATED TERMINAL INFORMATION SERVICE (ATIS). The continuous broadcast of recorded non-control information at towered airports. Information typically includes wind speed, direction and active runway.

AVIGATION EASEMENT. A contractual right or a property interest in land over which a right of unobstructed flight in the airspace is established.

AZIMUTH. Horizontal direction expressed as the angular distance between true north and the direction of a fixed point (as the observer's heading).

BASE LEG. A flight path at right angles to the landing runway off its approach end. The base leg normally extends from the downwind leg to the intersection of the extended runway centerline. See Traffic Pattern.

BASED AIRCRAFT. The general aviation aircraft that uses a specific airport as a home base.

BEARING. The horizontal direction to or from any point, usually measured clockwise from true north or magnetic north.

BLAST FENCE. A barrier used to divert or dissipate jet blast or propeller wash.

BLAST PAD. A prepared surface adjacent to the end of a runway for the purpose of eliminating the erosion of the ground surface by the wind forces produced by airplanes at the initiation of takeoff operations.

BUILDING RESTRICTION LINE (BRL). A line that identifies suitable building area locations on the airport.

BYPASS TAXIWAY. A taxiway used to reduce aircraft queuing demand by providing multiple takeoff points.

CAPITAL IMPROVEMENT PLAN. The planning program used by the FAA to identify, prioritize, and distribute funds for airport development and the needs of the National Airspace System to meet specified national goals and objectives.

CATEGORY-I (CAT-I). An instrument approach or approach and landing with a Height Above Threshold (HATh) or minimum descent altitude not lower than 200 ft. (60 m) and with either a visibility not less than ½ statute mile (800m), or a runway visual range not less than 1800 ft. (550m).

CATEGORY-II (CAT-II). An instrument approach or approach and landing with a Height Above Threshold (HATh) lower than 200 ft. (60 m) but not lower than 100 ft. (30 m) and a runway visual range not less than 1200 ft. (350m).

CATEGORY-III (CAT-III). An instrument approach or approach and landing with a Height Above Threshold (HATh) lower than 100 ft. (30m), or no HATh, or a runway visual range less than 1200 ft. (350m).

CEILING. The height above the ground surface to the location of the lowest layer of clouds which is reported as either broken or overcast.

CIRCLING APPROACH. A maneuver initiated by the pilot to align the aircraft with the runway for landing when flying a predetermined circling instrument approach under IFR.

CLASS A AIRSPACE. See Controlled Airspace.

CLASS B AIRSPACE. See Controlled Airspace.

CLASS C AIRSPACE. See Controlled Airspace.

CLASS D AIRSPACE. See Controlled Airspace.

CLASS E AIRSPACE. See Controlled Airspace.

CLASS G AIRSPACE. See Controlled Airspace.

CLEARWAY (CYW). A defined rectangular area beyond the end of the runway cleared or suitable for use in lieu of runway to satisfy takeoff distance requirements.

COMMON TRAFFIC ADVISORY FREQUENCY. A radio frequency identified in the appropriate aeronautical chart which is designated for the purpose of transmitting airport advisory information and procedures while operating to and from an uncontrolled airport.

COMPASS LOCATOR (LOM). A low power, low/medium frequency radio-beacon installed in conjunction with the instrument landing system at one or two or the marker sites.

CONICAL SURFACE. An imaginary obstruction-limiting surface defined in FAR Part 77 that extends from the edge of the horizontal surface outward and upward at a slope of 20 to 1 for a horizontal distance of 4,000 feet.

CONTROLLED AIRPORT. An airport that has an operating airport traffic control tower.

CONTROLLED AIRSPACE. Airspace of defined dimensions within which air traffic control services are provided to instrument flight rules (IFR) and visual flight rules (VFR) flights in accordance with the airspace classification. Controlled airspace in the United States is designated as follows.

- **CLASS A.** The airspace from 18,000 feet mean sea level (MSL) up to but not including 60,000 MSL (flight level FL600).

- **CLASS B.** Generally, the airspace from the surface to 10,000 feet MSL surrounding the nation's busiest airports. The configuration of Class B airspace is unique to each airport, but typically consists of two or more layers of airspace and is designed to contain all published instrument approach procedures to the airport. An air traffic control clearance is required for all aircraft to operate in the area.

- **CLASS C.** Generally, the airspace from the surface to 4,000 feet above the airport elevation (charted as MSL) surrounding those airports that have an operational control tower and radar approach and are served by a qualifying number of IFR operations or passenger enplanements. Although individually tailored for each airport, Class C airspace typically consists of a surface area with a five nautical miles (nm) radius and an outer area with a 10 nm radius that extends from 1,200 feet to 4,000 feet above the airport elevation. Two-way radio communication is required for all aircraft.

- **CLASS D.** Generally, that airspace from the surface to 2,500 feet above the airport elevation (charted as MSL) surrounding those airports that have an operational control tower. Class D airspace is individually tailored and configured to encompass published instrument approach procedures. Unless otherwise authorized, all persons must establish two-way radio communications.

- **CLASS E.** Generally, controlled airspace not classified as Class A, B, C or D. Class E airspace extends upward from either the surface or a designated altitude to the overlying or adjacent controlled airspace. When designated as a surface area, the airspace will be configured to contain all instrument procedures. Class E airspace encompasses all Victor Airways. Only aircraft following instrument flight rules are required to establish two-way radio communications with air traffic control.

- **CLASS G.** Generally, that airspace not classified as Class A, B, C, D or E. Class G airspace extends from the surface to the overlying Class E airspace

CONTROLLED FIRING AREA. See special-use airspace.

CROSSWIND. Wind flow that is not parallel to the runway of the flight of an aircraft.

CROSSWIND COMPONENT. The component of wind that is at a right angle to the runway centerline or the intended flight path of an aircraft.

CROSSWIND LEG. A flight path at right angles to the landing runway off its upwind end. See Traffic Pattern.

DECIBEL. A unit of noise representing a level relative to a reference of a sound pressure 20 micro newtons per square meter.

DECISION HEIGHT. The height above the end of the runway surface at which a decision must be made by a pilot during the ILS or Precision Approach Radar approach to either continue the approach or to execute a missed approach.

DECLARED DISTANCES. The distances declared available for the airplane's takeoff run, takeoff distance, accelerate-stop distance and landing distance requirements. The distances are:

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

- **TAKEOFF DISTANCE AVAILABLE (TODA).** The TORA plus the length of any remaining runway and/or clearway beyond the far end of the TORA.

- **ACCELERATE – STOP DISTANCE AVAILABLE (ASDA).** The runway plus stopway length declared available for the acceleration and deceleration of an aircraft aborting a takeoff.

- **LANDING DISTANCE AVAILABLE (LDA).** The runway length declared available and suitable for landing.

DESIGN AIRCRAFT. An aircraft with characteristics that determine the application of airport design standards for a specific runway, taxiway, taxilane, apron, or other facility (such as Engineered Materials Arresting System [EMAS]). This aircraft can be a specific aircraft model or a composite of several aircraft using, expected, or intended to use the airport or part of the airport. (Also called "critical aircraft" or "critical design aircraft.")

DISPLACED THRESHOLD. A threshold that is located at a point on the runway other than the designated beginning of the runway.

DISTANCE MEASURING EQUIPMENT (DME). Equipment (airborne and ground) used to measure, in nautical miles, the slant range distance of an aircraft from the DME navigational aid.

DNL. The 24-hour average sound level, in A-weighed decibels, obtained after the addition of ten decibels to sound levels for the periods between 10 pm and 7 am as averaged over a span of one year. It is the FAA standard metric for determining the cumulative exposure of individuals to noise.

DOWNWIND LEG. A flight path parallel to the landing runway in the direction opposite to landing. The downwind leg normally extends between the crosswind leg and the base leg. Also see Traffic Pattern.

EASEMENT. The legal right of one party to use a portion of the total rights in real estate owned by another party. This may include the right of passage over, on or below property; certain air rights above property, including view rights; and the rights to any specified form of development or activity, as well as any other legal rights in the property that may be specified in the easement document.

END-AROUND TAXIWAY (EAT). A taxiway crossing the extended centerline of a runway, which does not require specific clearance from air traffic control (ATC) to cross the extended centerline of the runway.

ENPLANED PASSENGERS. The total number of revenue passengers boarding aircraft, including originating, stop-over, and transfer passengers, in scheduled and non-scheduled services.

ENPLANEMENT. The boarding of a passenger, cargo, freight or mail on an aircraft at an airport.

ENTITLEMENT. Federal funds for which a commercial service airport may be eligible based upon its annual passenger enplanements.

ENTRANCE TAXIWAY. A taxiway designed to be used by an aircraft entering a runway. Entrance taxiways may also be used to exit a runway.

EXIT TAXIWAY. A taxiway designed to be used by an aircraft only to exit a runway.

ENVIRONMENTAL ASSESSMENT (EA). An environmental analysis performed pursuant to the National Environmental Policy Act to determine whether an action would significantly affect the environment and thus require a more detailed environmental impact assessment.

ENVIRONMENTAL AUDIT. An assessment of the current status of a party's compliance with applicable environmental requirements of a party's environmental compliance policies, practices and controls.

FEDERAL AVIATION REGULATIONS. The general and permanent rules established by the executive departments and agencies of the Federal Government for aviation, which are published in the Federal Register. These are aviation subset of the Code of Federal Regulations.

FINAL APPROACH. A flight path in the direction of landing along the extended runway centerline. The final approach normally extends from the base leg to the runway. See Traffic Pattern

FINAL APPROACH AND TAKEOFF AREA (FATO). A defined area over which the final phase of the helicopter approach to a hover, or a landing is completed and from which takeoff is initiated.

FINAL APPROACH FIX. The designated point at which the final approach segment for an aircraft landing on a runway begins for a non-precision approach.

FIXED BASE OPERATOR (FBO). An FBO typically offers the following services (or a combination thereof): aircraft charter operation, aircraft rental, aircraft storage, flight training, aircraft sales/leasing, aircraft component maintenance, aircraft parts sales, and aircraft maintenance.

FLIGHT SERVICE STATION. An operations facility in the national flight advisory system which utilizes data interchange facilities for the collection and dissemination of Notices to Airmen, weather, and administrative data and which provides pre-flight and in-flight advisory services to pilots through air and ground based communication facility.

FRANGIBLE NAVAID. A navigational aid which retains its structural integrity and stiffness up to a designated maximum load, but on impact from a greater load, breaks, distorts, or yields in such a manner as to present the minimum hazard to aircraft.

GENERAL AVIATION. That portion of civil aviation that encompasses all facets of aviation except air carriers holding a certificate of convenience and necessity, and large aircraft commercial operators.

GENERAL AVIATION AIRPORT. An airport that provides air service to only general aviation.

GLIDE PATH ANGLE (GPA). The GPA is the angle of the final approach descent path relative to the approach surface baseline.

GLIDE PATH QUALIFICATION SURFACE (GQS). An imaginary surface extending from the runway threshold along the runway centerline extended to the Decision Altitude (DA) point.

GLIDE SLOPE (GS). Provides vertical guidance for aircraft during approach and landing. The glide slope consists of 1) electronic components emitting signals which provide vertical guidance by reference to airborne instruments during instrument approaches such as ILS; or 2) visual ground aids, such as VASI, which provide vertical guidance for VFR approach or for the visual portion of an instrument approach and landing.

GLOBAL POSITIONING SYSTEM (GPS). A system of 24 satellites used as reference points to enable navigators equipped with GPS receivers to determine their latitude, longitude and altitude.

HAZARD to AIR NAVIGATION. An existing or proposed object that the FAA, as a result of an aeronautical study, determines will have a substantial adverse effect upon the safe and efficient use of navigable airspace by aircraft, operation of air navigation facilities, or existing or potential airport capacity.

HEIGHT ABOVE THRESHOLD (HATh). The height of the Decision Altitude (DA) above the threshold.

HELIPAD. A designated area for the takeoff, landing and parking of helicopters.

HIGH INTENSITY RUNWAY LIGHTS. The highest classification in terms of intensity or brightness for lights designated for use in delineating the sides of a runway.

HIGH-SPEED EXIT TAXIWAY. A long radius taxiway designed to expedite aircraft turning off the runway after land (at speeds up to 60 knots), thus reducing runway occupancy time.

HORIZONTAL SURFACE. An imaginary obstruction-limiting surface defined in FAR Part 77 that is specified as a portion of a horizontal plane surrounding a runway located 150 feet above the established airport elevation. The specific horizontal dimensions of this surface are a function of the types of approaches existing or planned for the runway.

INITIAL APPROACH FIX. The designated point at which the initial approach segment begins for an instrument approach to a runway.

INSTRUMENT APPROACH PROCEDURE. A series of predetermined maneuvers for the orderly transfer of an aircraft under instrument flight conditions from the beginning of the initial approach to a landing or to a point from which a landing may be made visually.

INSTRUMENT FLIGHT RULES (IFR). Rules governing the procedures for conducting instrument flight. Also a term used by pilots and controllers to indicate type of flight plan.

INSTRUMENT LANDING SYSTEM (ILS). A precision instrument approach system, which normally consists of the following electronic components and visual aids: 1) localizer, 2) glide slope, 3) outer marker, 4) middle marker and 5) approach lights.

INSTRUMENT METEOROLOGICAL CONDITIONS. Meteorological conditions expressed in terms of specific visibility and ceiling conditions that are less than the minimums specified for visual meteorological conditions.

ITINERANT OPERATIONS. All aircraft operations other than local operations.

KNOTS. A unit of speed length used in navigation that is equivalent to the number of nautical miles traveled in one hour.

LANDSIDE. The portion of an airport that provides the facilities necessary for the processing of passengers, cargo, freight and ground transportation vehicles.

LANDING DISTANCE AVAILABLE (LDA). See declared distances.

LARGE AIRPLANE. An airplane that has a maximum certified takeoff weight in excess of 12,500 pounds.

LOCAL AREA AUGMENTATION SYSTEM. A differential GPS system that provides localized measurement correction signals to the basic GPS signals to improve navigational accuracy, integrity, continuity and availability.

LOCAL OPERATIONS. Aircraft operations performed by aircraft that are based at the airport and that operate in the local traffic pattern or within sight of the airport, that are known to be departing for or

arriving from flights in local practice areas within a prescribed distance from the airport, or that execute simulated instrument approaches at the airport.

LOCAL TRAFFIC. Aircraft operating in the traffic pattern or within site of the tower, or aircraft known to be departing or arriving from the local practice areas, or aircraft executing practice instrument approach procedures. Typically, this includes touch-and-go training operations.

LOCALIZER. The component of an ILS, which provides course guidance to the runway.

LOCALIZER TYPE DIRECTIONAL AID (LDA). A facility of comparable utility and accuracy to a localizer, but is not part of a complete ILS and is not aligned with the runway.

LORAN. Long range navigation, an electronic navigational aid which determines aircraft position and speed by measuring the difference in the time of reception of synchronized pulse signals from two fixed transmitters. Loran is used for en route navigation.

LOW IMPACT RESISTANT (LIR) SUPPORT. A support designed to resist operational and environmental static loads and fail when subjected to a shock load such as that from a colliding aircraft.

LOW INTENSITY RUNWAY LIGHTS. The lowest classification in terms of intensity or brightness for lights designated for use in delineating the sides of a runway.

MAIN GEAR WIDTH (MGW). The distance from the outer edge to outer edge of the widest set of main gear tires.

MEDIUM INTENSITY RUNWAY LIGHTS. The middle classification in terms of intensity or brightness for lights designated for use in delineating the sides of a runway.

MICROWAVE LANDING SYSTEM (MLS). An instrument approach and landing system that provides precision guidance in azimuth, elevation, and distance measurement.

MILITARY OPERATIONS AREA (MOA). See special-use airspace.

MILITARY TRAINING ROUTE. An air route depicted on aeronautical charts for the conduct of military flight training at speeds above 250 knots.

MISSED APPROACH COURSE (MAC). The flight route to be followed if, after an instrument approach, a landing is not effected, and occurring normally when the aircraft has descended to the decision height and has not established visual contact or when directed by air traffic control to pull up or to go around again.

MODIFICATION to STANDARDS. Any approved nonconformance to FAA standards, other than dimensional standards for Runway Safety Areas (RSAs), applicable to an airport design, construction, or equipment procurement project that is necessary to accommodate an unusual local condition for a specific project on a case-by-case basis while maintaining an acceptable level of safety.

MOVEMENT AREA. The runways, taxiways, and other areas of an airport which are utilized for taxiing/hover taxiing, air taxiing, takeoff, and landing of aircraft, exclusive of loading ramps and parking areas. At those airports with a tower, air traffic control clearance is required for entry onto the movement area.

NATIONAL AIRSPACE SYSTEM. The network of air traffic control facilities, air traffic control areas, and navigational facilities through the US.

NATIONAL PLAN OF INTEGRATED AIRPORT SYSTEMS. The national airport system plan developed by the Secretary of Transportation on a bi-annual basis for the development of public use airports to meet national air transportation needs.

NAUTICAL MILE. A unit of length used in navigation which is equivalent to the distance spanned by one minute of arc in latitude, that is, 1,852 meters or 6,076 feet. It is equivalent to approximately 1.15 statute mile.

NAVAID. A term used to describe any electrical or visual air navigational aid, light, sign, and associated supporting equipment.

NOISE CONTOUR. A continuous line on a map of the airport vicinity connecting all points of the same noise exposure level.

NONDIRECTIONAL BEACON (NDB). A beacon transmitting nondirectional signals whereby the pilot of an aircraft equipped with direction finding equipment can determine his/her bearing to and from the radio beacon and home on, or track to, the station. When the radio beacon is installed in conjunction with the Instrument Landing System marker, it is normally called a compass locator.

NONPRECISION APPROACH PROCEDURE. A standard instrument approach procedure in which no electronic glide slope is provided, such as VOR, TACAN, NDB or LOC.

OBJECT FREE AREA (OFA). An area on the ground centered on a runway, taxiway or taxilane centerline provided to enhance the safety of aircraft operations by having the area free of objects, except for objects that need to be located in the OFA for air navigation or aircraft ground maneuvering purposes.

OBSTACLE FREE ZONE (OFZ). The airspace below 150 feet above the established airport elevation and along the runway and extended runway centerline that is required to be kept clear of all objects, except for frangible visual NAVAIDs that need to be located in the OFZ because of their function, in order to provide clearance for aircraft landing or taking off from the runway, and for missed approaches.

OPERATION. A takeoff or landing.

OUTER MARKER (OM). An ILS navigation facility in the terminal area navigation system located four to seven miles from the runway edge on the extended centerline indicating to the pilot that he/she is passing over the facility and can begin final approach.

PILOT CONTROLLED LIGHTING. Runway lighting systems at an airport that are controlled by activating the microphone of a pilot on a specified radio frequency.

PRECISION APPROACH. A standard instrument approach procedure, which provides runway alignment and glide slope (descent) information. It is categorized as follows:

- **CATEGORY I.** A precision approach which provides for approaches with a decision height of not less than 200 feet and visibility not less than ½ mile or Runway Visual Range (RVR) 2400 with operative touchdown zone and runway centerline lights.

- **CATEGORY II.** A precision approach, which provides for approaches with a decision height of not less than 100 feet and visibility not less than 1200 feet RVR.

- **CATEGORY III.** A precision approach, which provides for approaches with minima less than Category II.

PRECISION APPROACH PATH INDICATOR (PAPI). A lighting system providing visual approach slope guidance to aircraft during a landing approach. It is similar to a Visual Approach Slope Indicator (VASI) but provides a sharper transition between the colored indicator lights.

PRECISION OBSTACLE FREE ZONE (POFZ). An area centered on the extended runway centerline, beginning at the runway threshold and extending behind the runway threshold that is 200 feet long by 800 feet wide. The POFZ is a clearing standard, which requires the POFZ to be kept clear of above ground objects protruding above the runway safety area edge elevation (except for NAVAIDs). The POFZ applies to all new authorized instrument approach procedures with less than ¾ mile visibility.

PRIMARY AIRPORT. A commercial service airport that enplanes at least 10,000 annual passengers.

PRIMARY SURFACE. An imaginary obstruction limiting surface defined in FAR Part 77 that is specified as a rectangular surface longitudinally centered about a runway. The specific dimensions of this surface are a function of the types of approaches existing or planned for the runway.

PROHIBITED AREA. See special-use airspace.

REMOTE TRANSMITTER / RECEIVER (RTR). See remote communications outlet. RTRs serve ARTCCs.

RELIEVER AIRPORT. An airport to serve general aviation aircraft, which might otherwise use a congested air-carrier served airport.

RESTRICTED AREA. See special-use airspace.

RNAV. Area Navigation – airborne equipment, which permits flights over determined tracks within prescribed accuracy tolerances without the need to overfly ground-based navigation facilities. Used en route and for approaches to an airport.

RUNWAY. A defined rectangular area on an airport prepared for an aircraft landing and taking off. Runways are normally numbered in relation to their magnetic direction, rounded off to the nearest 10 degrees. The runway heading on the opposite end of the runway is 180 degrees from that runway end. Aircraft can takeoff or land from either end of a runway, depending upon wind direction.

RUNWAY ALIGNEMENT INDICATOR LIGHT. A series of high intensity sequentially flashing lights installed on the extended centerline of the runway usually in conjunction with an approach lighting system.

RUNWAY BLAST PAD. A surface adjacent to the ends of runways provided to reduce the erosive effect of jet blast and propeller wash.

RUNWAY END IDENTIFIER LIGHTS (REIL). Two synchronized flashing lights, one on each side of the runway threshold, which provide rapid and positive identification of the approach end of a particular runway.

RUNWAY GRADIENT. The average slope, measured in percent, between the two ends of a runway.

RUNWAY PROTECTION ZONE (RPZ). An area off the runway end to enhance the protection of people and property on the ground. The RPZ is trapezoidal in shape. Its dimensions are determined by the aircraft approach speed and runway approach type/minima.

RUNWAY REFERENCE CODE (RRC). A code signifying the current operational capabilities of a runway and associated parallel taxiway.

RUNWAY SAFETY AREA (RSA). A defined surface surrounding the runway prepared or suitable for reducing the risk of damage to airplanes in the event of an undershoot, overshoot or excursion from the runway.

RUNWAY VISUAL RANGE (RVR). An instrumentally derived value, in feet, representing the horizontal distance a pilot can see down the runway from the runway end.

RUNWAY VISIBILITY ZONE (RVZ). An area on the airport to be kept clear of permanent objects so that there is an unobstructed line-of-site from any point five feet above the runway centerline to any point five feet above an intersecting runway centerline.

SEGMENTED CIRCLE. A system of visual indicators designed to provide traffic pattern information at airports without operating control towers.

SHOULDER. An area adjacent to the edge of paved runways, taxiways or aprons providing a transition between the pavement and the adjacent surface; support for aircraft running off the pavement; enhanced drainage; and blast protection. The shoulder does not necessarily need to be paved.

SLANT-RANGE DISTANCE. The straight line distance between an aircraft and a point on the ground.

SMALL AIRPLANE. An airplane that has a maximum certified takeoff weight of up to 12,500 pounds.

SPECIAL USE AIRSPACE. Airspace of defined dimensions identified by a surface area wherein activities must be confined because of their nature and/or wherein limitations may be imposed upon aircraft operations that are not a part of those activities. Special-use airspace classifications include:

- **ALERT AREA.** Airspace that may contain a high volume of pilot training activities or an unusual type of aerial activity, neither of which is hazardous to aircraft.

- **CONTROLLED FIRING AREA.** Airspace wherein activities are conducted under conditions so controlled as to eliminate hazards to nonparticipating aircraft and to ensure the safety of persons or property on the ground.

- **MILITARY OPERATIONS AREA (MOA).** Designated airspace with defined vertical and lateral dimensions established outside Class A airspace to separate/segregate certain military activities from instrument flight rule (IFR) traffic and to identify for visual flight rule (VFR) traffic where these activities are conducted.

- **PROHIBITED AREA.** Designated airspace within which the flight of aircraft is prohibited.

- **RESTRICTED AREA.** Airspace designated under FAR 73, within which the flight of aircraft, while not wholly prohibited, is subject to restriction. Most restricted areas are designated joint use. When not in use by the using agency, IFR/VFR operations can be authorized by the controlling air traffic control facility.

- **WARNING AREA.** Airspace, which may contain hazards to nonparticipating aircraft.

STANDARD INSTRUMENT DEPARTURE (SID). A preplanned coded air traffic control IFR departure routing, preprinted for pilot use in graphic and textual form only.

STANDARD TERMINAL ARRIVAL (STAR). A preplanned coded air traffic control IFR arrival routing, preprinted for pilot use in graphic and textual or textual form only.

STOP-AND-GO. A procedure wherein an aircraft will land, make a complete stop of the runway, and then commence a takeoff from that point. A stop-and-go is recorded as two operations: one operations for the landing and one operations for the takeoff.

STOPWAY. An area beyond the takeoff runway, no less wide than the runway and centered on the extended centerline of the runway, able to support an airplane during an aborted takeoff, without causing structural damage to the airplane, and designated for use in decelerating the airplane during an aborted takeoff.

STRAIGHT-IN LANDING / APPROACH. A landing made on a runway aligned within 30 degrees of the final approach course following completion of an instrument approach.

TACTICAL AIR NAVIGATION (TACAN). An ultra-high frequency electronic air navigation system, which provides suitably-equipped aircraft a continuous indication of bearing and distance to the TACAN station.

TAKEOFF DISTANCE AVAILABLE (TODA). See declared distances.

TAKEOFF RUN AVAILABLE (TORA). See declared distances.

TAXILANE. A taxiway designed for low speed and precise taxiing. Taxilanes are usually, but not always, located outside the movement area, providing access from taxiways (usually an apron taxiway) to aircraft parking positions and other terminal areas.

TAXIWAY. A defined path established for the taxiing of aircraft from one part of an airport to another.

TAXIWAY DESIGN GROUP (TDG). A classification of airplanes based on outer to outer Main Gear Width (MGW) and Cockpit to Main Gear (CMG) distance.

TAXIWAY SAFETY AREA (TSA). A defined surface alongside the taxiway prepared or suitable for reducing the risk of damage to an airplane unintentionally departing the taxiway.

TETRAHEDRON. A device used as a landing indicator. The small end of the tetrahedron points in the direction of landing.

THRESHOLD. The beginning of that portion of the runway available for landing. In some instances the landing threshold may be displaced.

TOUCH-AND-GO. An operation by an aircraft that lands and departs on a runway without stopping or exiting the runway. A touch-and-go is recorded as two operations: one operation for the landing and one operation for the takeoff.

TOUCHDOWN ZONE (TDZ). The first 3,000 feet of the runway beginning at the threshold.

TOUCHDOWN ZONE ELEVATION (TDZE). The highest elevation in the touchdown zone.

TOUCHDOWN ZONE (TDZ) LIGHTING. Two rows of transverse light bars located symmetrically about the runway centerline normally at 100-foot intervals. The basic system extends 3,000 feet along the runway.

TRAFFIC PATTERN. The traffic flow that is prescribed for an aircraft landing or taking off from an airport. The components of a typical traffic pattern are the upwind leg, crosswind leg, downwind leg, and final approach.

UNCONTROLLED AIRPORT. An airport without an air traffic control tower at which the control of visual VFR traffic is not exercised.

UNCONTROLLED AIRSPACE. Airspace within which aircraft are not subject to air traffic control.

UNICOM. A nongovernmental communication facility, which may provide airport information at certain airports. Locations and frequencies of UNICOMs are shown on aeronautical charts and publications.

UPWIND LEG. A flight path parallel to the landing runway in the direction of landing. See traffic pattern.

VECTOR. A heading issued to an aircraft to provide navigational guidance by radar.

VERY HIGH FREQUENCY / OMNIDIRECTIONAL RANGE STATION (VOR). A ground-based electronic navigation aid transmitting very high frequency navigation signals, 360 degrees in azimuth, oriented from magnetic north. Used as the basis for navigation in the national airspace system. The VOR periodically identifies itself by Morse code and may have an additional voice identification feature.

VERY HIGH FREQUENCY OMNIDIRECTIONAL RANGE STATION / TACTICAL AIR NAVIGATION (VORTAC). A navigation aid providing VOR azimuth, TACAN azimuth and TACAN distance-measuring equipment (DME) at one site.

VICTOR AIRWAY. A control area or portion thereof established in the form of a corridor, the centerline of which is defined by radio navigational aids.

VISUAL APPROACH. An approach wherein an aircraft on an IFR flight plan, operating in VFR conditions under the control on an air traffic control facility and having an air traffic control authorization, may proceed to the airport of destination in VFR conditions.

VISUAL APPROACH SLOPE INDICATOR (VASI). An airport lighting facility providing vertical visual approach slope guidance to aircraft during approach to landing by radiating a directional pattern of high-intensity red and white focused light beams, which indicate to the pilot whether or he or she is on path. Some airports serving large aircraft have three-bar VASIs that provide two visual guide paths to the same runway.

VISUAL FLIGHT RULES (VFR). Rules that govern the procedures for conducting flight under visual conditions. The term VFR is also used in the United States to indicate weather conditions that are equal to or greater than minimum VFR requirement. In addition, it is used by pilots and controllers to indicate type of flight plan.

VISUAL METEOROLOGICAL CONDITIONS. Meteorological conditions expressed in terms of specific visibility and ceiling conditions which are equal to or greater than the threshold values for instrument meteorological conditions.

WARNING AREA. See special-use airspace.

WIDE AREA AUGMENTATION SYSTEM (WAAS). The Wide Area Augmentation System (WAAS) uses a system of ground stations to provide necessary augmentations to the GPS Standard Positioning Service (SPS) navigation signal. A network of precisely surveyed ground reference stations is strategically positioned across the country to collect GPS satellite data. Using this information, a message is developed to correct any signal errors.

WINGSPAN The maximum horizontal distance from one wingtip to the other wingtip, including the horizontal component of any extensions such as winglets or raked wingtips.

ACRONYMS / ABBREVIATIONS

AC. Advisory circular

ADF. Automatic direction finder

ADG. Airplane design group

AFSS. Automated flight service station

AGL. Above ground level

AIA. Annual instrument approach

AIP. Airport improvement program

ALS. Approach lighting system

ALSF-1. Standard 2,400-foot high- intensity approach lighting system with sequenced flashers (Cat I configuration)

ALSF-2. Standard 2,400-foot high-intensity approach lighting system with sequenced flashers (Cat II configuration)

APV. Instrument approach procedure with vertical guidance

ARC. Airport reference code

ARFF. Aircraft rescue and firefighting

ARP. Airport reference point

ARTCC. Air route traffic control center

ASDA. Accelerate-stop distance available

ASR. Airport surveillance radar

ASOS. Automated surface observation station

ATCT. Air traffic control tower

ATIS. Automated terminal information service

AVGAS. Aviation gasoline (typically 100 low lead (LL))

AWOS. Automated weather observation station

BRL. Building restriction line

CFR. Code of Federal Regulations

CIP. Capital improvement program

CPO. Community Planning Organization

DME. Distance measuring equipment

DNL. Day-night noise level

DWL. Runway weight bearing capacity for aircraft with dual wheels per strut

DTWL. Runway weight bearing capacity for aircraft with dual-tandem type landing gear

EAA. Experimental Aircraft Association

FAA. Federal Aviation Administration

FAM. Financial Aid to Municipalities

FAR. Federal Aviation Regulation

FBO. Fixed base operator

FY. Fiscal year

GA. General Aviation

GPS. Global positioning system

GS. Glide slope

HIRL. High-intensity runway edge lighting

IFR. Instrument flight rules

ILS. Instrument landing system

IM. Inner marker

LDA. Landing distance available

LIRL. Low-intensity runway edge lighting

LMM. Compass locator at middle marker

LOC. ILS localizer

LOM. Compass locator at ILS outer marker

LORAN. Long range navigation

MALS. Medium-intensity approach lighting system

MALSR. Medium-intensity approach lighting system with runway alignment indicator lights

MIRL. Medium-intensity runway edge lighting

MITL. Medium-intensity taxiway edge lighting

MLS. Microwave landing system

MM. Middle marker

MOA. Military operations area

MSL. Mean sea level

NAVAID. Navigational aid

NDB. Nondirectional radio beacon

NM. Nautical mile (6,076.1 feet)

NOTAM. Notice to airmen

NPIAS. National plan of integrated airport systems

NPRM. Notice of proposed rulemaking

ODA. Oregon Department of Aviation

ODALS. Omnidirectional approach lighting system

OFA. Object free area

OFZ. Obstacle free zone

OM. Outer marker

OPA. Oregon Pilots Association

PAC. Project Advisory Committee

PAPI. Precision approach path indicator

PFC. Passenger facility charge

PCL. Pilot-controlled lighting

PLASI. Pulsating visual approach slope indicator

PMP. Pavement Maintenance Program

POFA. Precision object free area

PVASI. Pulsating/steady visual approach slope indicator

RCO. Remote communications outlet

RDG. Runway design group

REIL. Runway end identifier lights

RNAV. Area navigation

RPZ. Runway protection zone

RTR. Remote transmitter/receiver

RVR. Runway visibility range

RVZ. Runway visibility zone

SALS. Short approach lighting system

SASP. State Aviation System Plan

SEL. Sound exposure level

SID. Standard instrument departure

SM. Statute mile (5,280 feet)

SRE. Snow removal equipment

SSALF. Simplified short approach lighting system with sequenced flashers

SSALR. Simplified short approach lighting system with runway alignment indicator lights

STAR. Standard terminal arrival route

SWL. Runway weight bearing capacity for aircraft with single-wheel type landing gear

STWL. Runway weight bearing capacity for aircraft with single-wheel tandem type landing gear

TACAN. Tactical air navigation

TDG. Taxiway design group

TDZ. Touchdown zone

TDZE. Touchdown zone elevation

TAF. Terminal Area Forecast

TODA. Takeoff distance available

TORA. Takeoff run available

TRACON. Terminal radar approach control

VASI. Visual approach slope indicator

VFR. Visual flight rules

VHF. Very high frequency

VOR. Very high frequency omnidirectional range

VORTAC. VOR and TACAN collocated

WAAS. Wide Area Augmentation System

Appendix B
Airport User Survey

INTRODUCTION

The following airport user survey was distributed early in the planning process, as discussed in Chapter One.

PORT OF ST. HELENS

Scappoose Industrial Airpark User Survey

The Port of St Helens (POSH) is in the initial stages of updating the master plan for the Scappoose Industrial Airpark (SPB). Please help us better understand airport use and how the airport could be improved. Your input will be documented and included in the master plan update. Fill in the blank or circle your answer, as appropriate.

What zip code do you live in?

What type aircraft do you own or fly? *(List Model/Type)*

Estimate your number of annual landings. *(Include Touch & Go)*

What percent of your annual landings are at SPB? %

What is your primary use of SPB? *(Circle which applies most to you.)*

Business	Emergency
Training	Other:
Recreational	

Is your aircraft based at SPB?	YES	NO
If based at SPB, do you lease/rent aircraft storage/tiedown from POSH or private business?	POSH	Private Business

If not at SPB, where is your aircraft based? *(List Airport ID)*

Why don't you base your aircraft at SPB? *(Circle all that apply.)*

Inadequate Runway Length	No Precision Instrument Approach
Lack of Suitable Hangar	Inconvenient Location
Cost of Hangar	Other:
Lack of Air Traffic Control Tower	

What should be done to improve SPB?

OPTIONAL: If you provide your name, address, phone number, and email address, we will notify you of public meetings about the master plan and may contact you for more information related to the master plan update.

Name:

Mailing Address:

Phone Number: Email Address:

Thank you for completing this survey!
Please return the survey by mail, fax or email by April 30, 2013, to:

Wendy Renier, Senior Aviation Planner
WHPacific | 9755 SW Barnes Rd, Ste 300 | Portland, OR 97225
Office 503.626.0455 | Fax 503.526.0755 | wrenier@whpacific.com

INTRODUCTION

This appendix contains FAA approval letters to include the Forecast Approval, as noted in Chapter Three. Once the Airport Layout Plan is approved, a copy of the letter will be included in this appendix.

U.S. Department
of Transportation

**Federal Aviation
Administration**

Seattle Airports District Office
1601 Lind Avenue, S. W., Ste 250
Renton, Washington 98057-3356

February 18, 2014

Mr. Craig Allison
Property & Operations Manager
PO Box 598
St Helens, OR 97051

Dear Mr. Allison:

Airport Master Plan Study
Airport Improvement Program (AIP) Project Number 3-41-0056-018-12

I have reviewed the Aviation Activity Forecasts submitted by your consultants. I find adequate justification exists for the figures cited in the forecast tables of draft Chapter 3 and hereby approve the Forecast Summary.

As always, please feel free to contact me with any questions at: 425.227.2649 or by e-mail at: bruce.fisher@faa.gov.

Sincerely,

Bruce C. Fisher
Airport Planner, Oregon

cc: Ms. Wendy Renier, WHPacific, Inc.

Appendix D
OAP 2014 Update - Economic Analysis

INTRODUCTION

Included in this appendix is a copy of the Individual Airport Report prepared for Scappoose Industrial Airpark and published in April 2014. This report provides an updated economic impact analysis and compares the results to the previous 2007 analysis.

Economic Impact Analysis

The 2014 Update focuses on the Economic Impact Study that was completed as part of the Oregon Aviation Plan 2007. The Economic Impact Study Update (Update) was conducted to determine the value of the Oregon Aviation System. The Update includes fifty-seven Oregon airports listed in the National Plan of Integrated Airport Systems (NPAIS). The economic impact analysis of airports in Oregon was developed for each airport, measuring economic impacts of airport facilities, within regions and throughout the state. This study used the five regions of *ConnectOregon* to measure local/regional economic impacts of airports and for dependent non-aviation businesses.

Total economic impacts are the sum of on-airport economic activities, off-airport spending by visitors who arrive by air, and spin-off impacts (multiplier effect). Airport impacts are provided by region and state to show the contribution of each airport to the regional and state economies. In addition, aviation dependent impacts are provided by region to show the importance of airports in each region to non-aviation businesses. All impacts reported represent a base year of 2012. Each type of impact is defined in the following paragraphs.

On-Airport direct impacts represent economic activities that occur on airport grounds. Aviation related activities are those that would not occur without the airport, such as airlines, fixed base operators (FBO), government, and other tenants located at the airport or directly dependent on the airport. This category also includes airport management and other individuals employed directly by the airport, as well as retail and service operations for passengers, pilots, and other airport employees. In some cases, airports provide land or building space for companies that are not affiliated with aviation. These tenants are not related to the aviation mission of the airport, but are using the facility as a convenient and affordable business or industrial parks.

Off-Airport visitor spending (Direct Impacts) are expenditures made by air travelers who are visiting from outside the region, and occurs off the airport, in the regional economy. Visitor spending includes lodging, food, entertainment, retail purchases and ground transportation (retail purchases and on-airport car rentals are captured by on-airport impacts). Visitor spending is analyzed for commercial passengers as well as for general aviation pilots and passengers. Visitors flying into Oregon from another state or nation contribute to the airport's regional economy as well as to the state. However, passengers flying within Oregon, from one region to another, contribute to the region of their destination airport, but are not bringing additional money into Oregon. Therefore, in regions with air carrier airports, the direct impact of visitor spending for the region is higher than the impact of visitor spending for the state.

Airport dependent impacts represent area businesses that are dependent on an airport for incoming and outgoing, and for business travel. These businesses may relocate or suffer substantial loss if the airport were not available. This impact is not included in traditional economic impact methodology and is analyzed and reported by region for this study. Thus the economic dependence of a region on aviation represents the cumulative impacts of all airports within a region. The analysis is provided as an indicator of the importance of airports to regional economies.

Spin-off impacts (Multiplier Affect) are calculated using impact multipliers, which are used to reflect the recycling of dollars through both the regional and state economy. A dollar spent in the economy does not disappear; rather, it continues to move through the local economy in successive rounds until it is incrementally exported from the community. As the expenditures described above are released into the economy, they circulate among other industry sectors, creating successive waves of additional economic benefit in the form of jobs, payroll, and output (expenditures). These successive rounds of spending are known as spin-off impacts, and help to represent the full impact of each dollar spent in a region. An example would be an airport employee spending his or her salary for housing, food, and other services. Spending occurring outside the area is considered economic leakage and is not reflected in the multiplier. Spin-off impacts are often reported as indirect and induced impacts. Indirect impacts reflect the purchase of goods and services by businesses. Induced impacts reflect worker making consumer purchases.

The project team analyzed the economic contributions of 57 airports under the jurisdiction of the Oregon Department of Aviation (ODA) that are part of the NPIAS. The Port of Portland commissioned a separate economic impact study of Portland International Airport which is included by reference. The sum of economic impacts derived from the 2012 Update and the 2011 Port of Portland study account for economic impacts generated by the NPIAS airports in Oregon.

Contribution of Airports to the Economy of Oregon

As shown in **Table 1**, NPIAS airports in Oregon contributed a total economic impact of $9.1 billion to the state economy, including $3.6 billion from NPIAS airports and $5.5 billion from Portland International Airport.

Additional study highlights include:

- Oregon's NPIAS airports (excluding PDX), including airport tenants, directly employ 7,700 people for aviation related activities and expend $495 million in wages. PDX supports an additional 16,300 jobs and $922 million in wages.
- Oregon's NPIAS airports' (excluding PDX) employees and tenants earned an average annual salary $64,500 per year for aviation activities, including jobs related to administrating and maintaining airport facilities, servicing air carriers and GA aircraft, and providing terminal services to passengers, as well as to air crews and other employees.
- 5,000 jobs across the state are directly attributed to visitor spending at Oregon's NPIAS airports (excluding PDX).
- Air cargo and business travel services directly contribute $8 billion to the state economy by enabling long distance business sales of goods and services produced in Oregon. The value of instate productivity supported by aviation supports more than 23,700 jobs to State residents.

Table 1 2012 Economic Contribution of Airports to the Oregon Economy

	Jobs	Wages	Business Sales
Direct Effects of ODA On-Airport Aviation Activities and Visitor Spending			
On-Airport, including aviation-related tenants	7,677	$494,920,000	$1,680,058,000
Off-Airport: visitor spending	4,938	$102,187,000	$342,540,000
Subtotal of Direct Effects From ODA Airports	12,615	$597,107,000	$2,022,598,000
ODA Spin-off Effects of Supplier and Income Re-spending			
Due to On-Airport Aviation	11,193	$365,742,000	$1,351,803,000
Due to Visitor Spending	2,054	$80,250,000	$250,918,000
Subtotal of Spin-off Effects	13,247	$445,992,000	$1,602,721,000
Total ODA Airport Aviation Related Impacts	25,862	$1,043,099,000	$3,625,319,000
Portland International Airport Totals			
Airport Generated	16,308	$922,000,000	$3,725,000,000
Visitor Generated	35,963	$1,020,400,000	$1,752,700,000
Total Impact Portland International Airport	52,271	$1,942,500,000	$5,477,700,000
Grand Total – NPIAS Airports	**76,711**	**$2,811,790,000**	**$8,721,948,000**

Source: Airport and Tenant Surveys, EDR Group and Mead & Hunt Analyses, IMPLAN econometric package.
Note: Numbers may not add due to rounding.

Comparisons of 2007 and 2012 Studies

The 2007 and 2012 studies bracketed the severe national downturn that began in late 2008, and for which the effects are still being felt in states and communities across the United States. From 2007-2012 the Oregon gross state product increased in real terms by 15% but worker earnings fell by 2% and the number of jobs fell by 3%. Together, these data indicate that productivity per job of Oregon workers has increased, meaning on average it takes more economic activity to create a job and generate wages to those who are working.

Significant economic changes are also seen in air cargo. The International Trade Administration of the U.S. Census Bureau traces annual value and metric tonnage of international air exports from point of origin as well as by airport. (Unfortunately, no such data set is available for domestic cargo shipments.) Tonnage has decreased by 27% for goods produced in Oregon and shipped from Oregon airports (primarily Portland International Airport), while the value of Oregon generated goods has increased by 63% in constant value. Thus, less production is needed to sustain overall value across commodities. For domestic cargo shipments, PDX reported 127,890 tons enplaned in 2007 and 91,480 tons in 2012, a decrease of 28%.

The scopes of the 2007 and 2012 studies have two major differences. The first difference is in the airports that are covered by the two studies. The 2007 study encompassed all 93 public use airports in the state of Oregon, other than those operated by the Port of Portland. In contrast the 2012 study is limited to 56 NPIAS airports (National Plan for Integrated Air Service; NPIAS designation is by the Federal Aviation Administration). Three airports, Wasco State Airport, Hillsboro Airport and Troutdale airport are part of the 2012 study but were not included in the 2007 effort. Thus, 53 airports are in common in the two studies.

The second difference is that on-airport impacts counted in the 2007 studies included both aviation related and non-aviation related tenants, although these were separated when impacts were reported. The 2012 study is limited to aviation related tenants. A comparison of the 2007 and 2012 studies is shown in **Table 2**.

Table 2 Aviation impact comparison: 2007 vs. 2012 (in 2012 dollars) for 53 NPIAS airports

Impact Type	Jobs		Wages (thousands)		Business Sales (thousands)	
	2007	2012	2007	2012	2007	2012
On Airport tenants	7,287	6,774	$301,970	$417,349	$953,175	$1,445,103
Off Airport Visitor Spending	6,945	4,434	$120,299	$89,221	$377,978	$304,029
Subtotal Direct Contribution	14,232	11,208	$422,269	$422,269	$1,331,153	$1,749,132
Tenant Spin Off	12,033	9,836	$352,319	$309,185	$1,018,264	$1,173,627
Visitor Spending Spin Off	3,153	1,845	$92,081	$70,353	$357,883	$223,355
Subtotal Spin Off	15,186	11,681	$444,400	$379,538	$1,376,148	$1,396,982
Total Aviation Impacts	29,418	22,889	$866,669	$886,108	$2,707,300	$3,146,114
Reliant/Dependent Impacts	**91,645**	**75,984**	**$4,211,110**	**$4,680,386**	**$17,446,481**	**$15,500,260**

As shown is **Table 3**, it took 49% more business sales to generate a job in 2012 than in 2007, and workers were paid 31% more for the increase in productivity. For economic activities reliant on Oregon's NPIAS airports, labor productivity rose by 7% and wages were 34% higher, but as discussed above less cargo was moved and value per ton increased. Following **Table 3** is a summary entitled *Airport Role in Economy*, which illustrates the individual airport economic impact.

Table 3 Productivity analysis-change in wage and sales per job 2007 vs. 2012 (in 2012 dollars)

Impact Type	Wages per Job		Output per Job		% Change Wage	% Change Output
	2007	2012	2007	2012		
Total Aviation Related Impacts	$29,461	$38,713	$92,029	$137,451	31%	49%
Air Reliant/Dependent impacts	$45,950	$61,597	$190,371	$203,994	34%	7%

Oregon Aviation Plan 2014

Version OR 3.1 4/10/14

Airport Role in Economy

Airport: Scappoose Industrial Airpark
Airport Code: SPB

County: Columbia

Region: Portland/Metro

Evaluated for Year: 2012

Activity Data

Total Commercial Operations:	0
Total Commercial Enplanements:	0
Total Commercial Visitors:	0
Total GA Operations:	39,740
Total GA Passengers:	39,740
Total GA Visitors:	39,740
Total Military Operations:	0

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On-going Contribution to the Regional and State Economies

	Jobs		Wages		Business Sales	
	Local	**State**	**Local**	**State**	**Local**	**State**
Direct Effects of On Airport Activities and Visitor Spending						
1. On Airport (incl. FBO and air related tenants)	119	119	$13,007,000	$13,007,000	$39,162,000	$39,162,000
2. Off-Airport: Visitor Spending	53	53	$1,311,000	$1,311,000	$3,836,000	$3,836,000
Total Direct	172	172	$14,318,000	$14,318,000	$42,998,000	$42,998,000
Spin-off Effects: Supplier and Income Re-spending						
3. Due to On Airport Aviation	186	194	$7,503,000	$8,582,000	$22,202,000	$25,432,000
4. Due to Visitor Spending	20	21	$898,000	$990,000	$2,485,000	$2,795,000
Total Spin-off	206	215	$8,401,000	$9,572,000	$24,687,000	$28,227,000
Total Airport Aviation Related Impacts	378	387	$22,719,000	$23,890,000	$67,685,000	$71,225,000
Total Airport Generated Impacts - Not Aviation						
5. On Airport Non-aviation Activities	0	0	$0	$0	$0	$0
6. Spin-offs due to Non-aviation Activities	0	0	$0	$0	$0	$0
Total Airport Non-aviation Impacts	0	0	$0	$0	$0	$0
Total Aviation and Non-aviation Related	378	387	$22,719,000	$23,890,000	$67,685,000	$71,225,000
Regional Off-Airport Aviation Dependent Business Activity						
7. Direct Business Activity	15,983	15,983	$1,537,267,000	$1,537,267,000	$5,992,196,000	$5,992,196,000
8. Spin-offs due to Dependent Activity	39,188	40,722	$2,084,491,000	$2,157,879,000	$5,380,935,000	$5,961,690,000
Total Off-airport Aviation Dependent Activity	55,171	56,705	$3,621,758,000	$3,695,146,000	$11,373,131,000	$11,953,886,000

Note: Regional Off-airport Aviation Dependent Business Activities account for business activity in the region that rely on aviation for business travel and cargo, and do not reflect a specific airport.

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Appendix E
FAA RTTF Toolkit Information

INTRODUCTION

As mentioned in the Compliance Review chapter, section 136 of the FAA Modernization and Reform Act of 2012 permits sponsors of general aviation airports, as defined by the statute at title 49, U.S.C., § 47102(8), to enter into agreements granting through-the-fence (TTF) access to residential users, but includes specific terms and conditions.

The FAA created the "Residential Through-the-Fence Access Toolkit" to help educate airport sponsors about the new law as it applies to residential TTF. The toolkit provides a number of tools and sample documents that are helpful to sponsors with existing residential TTF agreements as well as sponsors considering new residential TTF agreements. The toolkit is available at:

http://www.faa.gov/airports/airport_compliance/residential_through_the_fence/

This appendix includes some of the documents provided as part of the toolkit. The airport sponsor is encouraged to visit the link provided above for additional information on the subject.