

Final Report



BANDON STATE AIRPORT | AIRPORT MASTER PLAN



OREGON DEPARTMENT OF AVIATION

BANDON STATE AIRPORT | AIRPORT MASTER PLAN

FINAL REPORT, APRIL 2017

PREPARED FOR



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Chapter 1 – Introduction & Project Overview



Chapter 1 – Introduction and Project Overview

Introduction

The Oregon State Department of Aviation has prepared an updated Airport Master Plan for Bandon State Airport (S05) in cooperation with the Federal Aviation Administration (FAA) to address the airport's needs for the next twenty years. The Airport Master Plan provides specific guidance in making the improvements necessary to maintain a safe and efficient airport that is economically, environmentally, and socially sustainable.



Study Purpose

The purpose of the Airport Master Plan is to define the current, short-term, and long-term needs of the Airport through a comprehensive evaluation of facilities, conditions and FAA airport planning and design standards. The study addresses elements of local planning (land use, transportation, environmental, economic development, etc.) that have the potential of affecting the planning, development, and operation of the airport. [FAA Advisory Circular 150/5070-6B Airport Master Plans](#) defines the specific requirements and evaluation methods established by FAA for the study.

Project Need

The FAA requires airports to periodically update their master plans as conditions change in order to maintain current planning. This project updates the 2003 Airport Layout Plan (Coffman Associates, W&H Pacific), which has provided the primary airport planning guidance for the Airport over the last ten years.

During this period, several of the airport layout plan recommendations have been implemented, changes have occurred in the local community, and FAA airport design standards have been updated. In addition, changes have occurred within the aviation industry and for both general aviation and commercial air service within the region.

Based on these factors, it was appropriate to update the long-term planning for the Airport to reflect changing local conditions, current trends, and current FAA standards. The 2014 Airport Master Plan and Airport Layout Plan (ALP) will replace the previous plan and meet the FAA's requirement to maintain current planning.

Project Funding

Funding for the Airport Master Plan Update was provided through an FAA Airport Improvement Program (AIP) grant (90%) with a local match (10%) provided by the Oregon Department of Aviation (ODA). ODA is funded through aviation user fees and does not use Oregon State General Fund dollars. The AIP is a dedicated fund administered by FAA with the specific purpose of maintaining and improving the nation's public use airports. The AIP is funded exclusively through fees paid by users of general aviation and commercial aviation and the funds can only be used for eligible aviation related projects.

Airport History

According to data contained on the Oregon Department of Aviation (ODA) website, Bandon State Airport was constructed on land that was donated by Bandon Aero Club in 1957. Bandon State Airport was established and dedicated in 1962 and has been owned and operated continuously by the Oregon Department of Transportation – Aeronautics Division, and subsequently ODA, for more than 50 years.

Study Organization

Work conducted during the Airport Master Plan Update was documented in a series of draft chapters to address each of the key study elements. The chapters reflect the FAA-approved scope of work and the content meets all FAA technical requirements.

The draft chapters and supporting documents were prepared over a period of approximately 12 months. Each draft chapter was reviewed by ODA, the planning advisory committee, and the FAA. The master plan elements were available for public review and comment throughout the project.

The 2014 Bandon State Airport Master Plan included the following chapters:

- *Chapter 1 – Introduction and Project Overview*
- *Chapter 2 – Inventory of Existing Conditions*
- *Chapter 3 – Aviation Activity Forecasts*
- *Chapter 4 – Airport Facility Requirements*
- *Chapter 5 – Airport Development Alternatives*
- *Chapter 6 – Environmental Review*
- *Chapter 7 – Financial and Development Program*
- *Chapter 8 – Airport Layout Plan*
- *Chapter 9 – Airport Land Use Compatibility*
- *Chapter 10 – Planning for Compliance and Solid Waste Recycling Plan*

Local Citizen Participation

The Oregon Department of Aviation (ODA) is committed to an inclusive, transparent planning process and ensured that project work products were available for public review. The public involvement element of the Airport Master Plan Update provided several ways for all interested individuals, organizations, or groups to participate in the project.

Draft work products developed during the project were available for public review and comment. Links to the documents were posted on ODA's webpage to allow for convenient access, review, and comment. Copies of the draft work products were available for public review and comment throughout the project. Comment forms were available for both electronic and printed versions of the draft work products.

A series of public meetings were held during the project to facilitate public participation. The project team presented information, provided updates on study progress and identified upcoming decision points in a workshop format to facilitate discussion. The project team utilized a variety of tools to encourage citizen participation, including surveys, project newsletters, and project updates were posted on the ODA's webpage.

A local planning advisory committee (PAC) was formed by ODA to assist the project team in reviewing draft technical working papers and to provide input into the planning process. The composition of the PAC was intended to provide an effective blend of airport users, neighbors, local business, local government representation, and other interests. A representative from the FAA Seattle Airports District Office served as *ex officio* member of the PAC. The PAC met throughout the project, reviewed and commented on draft

work products, discussed key project issues and provided local knowledge and expertise to the planning process. All PAC meetings were advertised and open to the public.

Summary

The FAA-defined airport master planning process requires a sequential, systematic approach which led to the selection of a preferred development option for the airport that was integrated into the Airport Layout Plan (ALP) and Airport Capital Improvement Program (ACIP). To meet this goal, the Airport Master Plan Update:

- *Provided an updated assessment of existing facilities and activity;*
- *Provided an updated forecast of airport activity measures (design aircraft, based aircraft, aircraft operations, etc.) for the current 20-year planning period;*
- *Examined previous planning recommendations (2003 Airport Layout Plan) as appropriate, to meet the current and projected airport facility needs, consistent with FAA airport design standards;*
- *Determined current and future facility requirements for both demand-driven development and conformance with FAA design standards;*
- *Provided consistency between airport planning and land use planning to promote maximum compatibility between the airport and surrounding areas;*
- *Prepared an updated Airport Layout Plan (ALP) drawing set to accurately reflect current conditions and master plan facility recommendations; and*
- *Developed an Airport Capital Improvement Program (ACIP) that prioritized improvements and estimated project development costs and funding eligibility for the 20-year planning period.*
- *Evaluated airport sponsor compliance with FAA Airport Improvement Program (AIP) grant assurances.*



The preparation of this document may have been supported, in part, through the Airport Improvement Program financial assistance from the Federal Aviation Administration as provided under Title 49, United States Code section 47104. The contents do not necessarily reflect the official views or policy of the FAA. Acceptance of this report by the FAA does not in any way constitute a commitment on the part of the United States to participate in any development depicted therein nor does it indicate that the proposed development is environmentally acceptable with appropriate public laws.

Chapter 2 – Inventory of Existing Conditions



Chapter 2 – Inventory of Existing Conditions

The purpose of this chapter is to document the existing facilities and conditions at Bandon State Airport (Airport Identifier Code: S05). The airport is owned and operated by the Oregon State Department of Aviation (ODA).



This project replaces the 2003 Airport Layout Plan Update, which serves as a primary source for inventory data.¹ When available, more recent information from various data sources was used to illustrate current conditions. Site visits were conducted to inspect existing airfield facilities. This chapter will support subsequent master plan tasks (forecasting, facility requirements assessments, etc.). The consultants worked closely with Oregon Department of Aviation staff to review the current facility and operational data.

Airport Locale

Bandon is located in Coos County on the southern Oregon Coast, approximately 24 miles southeast of Coos Bay on U.S. Highway 101. Bandon is one of seven incorporated cities in Coos County. Coquille is the county seat, located approximately 18 miles northeast of Bandon. The most recent (2013) population estimates for Bandon and Coos County were 3,100 and 62,860 respectively.²

¹ Bandon State Airport – Airport Layout Plan Report (Coffman Associates, W&H Pacific)

² Portland State University Population Research Center, Annual Certified Estimates

Bandon State Airport is located approximately two miles south of the city center, immediately east of U.S. Highway 101 (101), just outside the Bandon city limits but within the City of Bandon Urban Growth Boundary (UGB).

The City of Bandon is served by a rural fire district. The next closest emergency response is located in Coquille or Coos Bay. Bandon State Airport is equipped to accommodate fixed-wing and helicopter medevac flights, although the airport is not currently equipped with an instrument approach, which limits operations to visual flight rules (VFR) weather conditions.

Surface access to Bandon from the north and south is provided by U.S. Highway 101. Several state highways and county roads extend eastward from Highway 101 and connect to other communities. Coos Bay and North Bend are approximately 25 miles north via Highway 101 and Coquille is 18 miles east via State Highway 42S. Highway 42S also continues east to Winston and Roseburg (67 miles) at Interstate 5 (I-5). The Oregon-California border is approximately 107 miles south of Bandon on Highway 101.

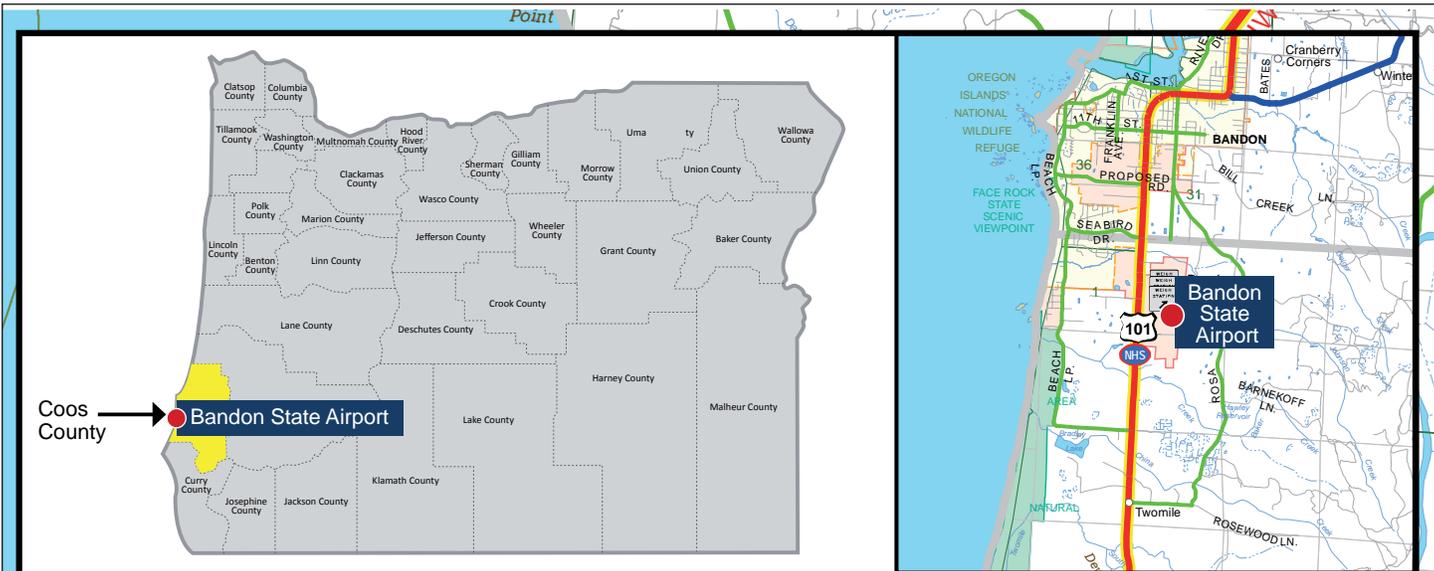
Bandon and the surrounding area provide a wide variety of recreational attractions and services for visitors to the southern Oregon Coast and seasonal or year-round residents. Bandon is home to several top rated golf courses that attract players worldwide. Bandon Dunes Golf Resort opened in 1999 with its first course, and has grown to five championship courses, the most recent opening in 2012. The resort provides a full range of guest services including lodging and a variety of amenities. Another recent addition to the area is Bandon Crossings Golf Course, a new 18-hole golf course that opened in 2007.

Bandon State Airport is one of four public use airports in Coos County; the other airports are Lakeside State Airport (14 nautical miles north), Southwest Oregon Regional (North Bend) (21 nautical miles north), and Powers Airport (20 nautical miles southeast). Cape Blanco State Airport, located 14 nautical miles south, is located in Curry County. Southwest Oregon Regional Airport is the nearest airport with scheduled commercial air service, an instrument approach, and local airport weather data.

A location and vicinity map for Bandon State Airport is provided in **Figure 2-1**.

Physical Geography

Coos County extends from the Pacific Ocean eastward into the Coast Range and the Klamath Mountains, with elevations ranging from sea level to approximately 4,600 feet above mean sea level (MSL). The western section of the county consists of marine terraces, dunes, and rolling hills. The central and eastern sections are mountainous forest lands. The Coos and Coquille Rivers are the primary drainage systems in the county. Bandon State Airport sits on a relatively level terrace with a published airport elevation (high point) of 122 feet MSL.



Climate

Mild temperatures and moderate precipitation characterize the marine climate of the southern Oregon Coast. Based on recorded climatic data for the period 1897 to 2013, Bandon's average maximum temperature is 66.8 degrees Fahrenheit (August) and the average minimum temperature is 38.5 degrees (January).³ Bandon averages 55.5 inches of precipitation and less than 1 inch of snowfall annually. Approximately 48 percent of annual precipitation occurs during the three-month period of November, December, and January. Precipitation during the summer months (June, July, and August) averages just 2.6 inches. Prevailing winds in the Bandon area generally follow a north-south pattern, which is aligned with Runway 16/34.

Historical Aviation Activity

Bandon State Airport accommodates a wide variety of aeronautical activity, including small single- and multi-engine aircraft and business class turbine aircraft (small business jets and turboprops) capable of operating on the current 3,601-foot runway, and helicopters.

The 2003 Airport Layout Plan estimated that Bandon State Airport had 29 based aircraft and 15,500 annual aircraft operations (takeoffs and landings) in 2003.⁴ The 2007 Oregon Aviation Plan Individual Airport Report for Bandon State Airport estimated 31 based aircraft and 15,930 general aviation aircraft operations in 2005. The current FAA 5010-1 Airport Record Form lists 38 based aircraft and 7,100 annual aircraft operations for the 12 months ending February 8, 2012. A detailed analysis of aviation activity data is presented in the updated aviation activity forecasts (Chapter 3). Recent estimates of airport activity are summarized in **Table 2-1**.

³ Western Regional Climate Center (Bandon, Oregon Station No. 350471)

⁴ W & H Pacific Airport Layout Plan (2003)

TABLE 2-1: BANDON STATE AIRPORT (S05) BASED AIRCRAFT AND OPERATIONS

ACTIVITY TYPE	ACTIVITY LEVEL
Based Aircraft <i>FAA Airport Record Form; current count to be verified by airport management</i>	
Single-Engine Piston	33
Multi-Engine Piston	5
Glider	0
Ultralight	0
Rotorcraft	0
Total Based Aircraft	38
Recent Annual Aircraft Operations Estimates	
➤ Oregon Aviation Plan (2005)	16,325
➤ FAA Airport Record Form (2012)	7,100

Airfield

AIRFIELD FACILITIES

Bandon State Airport consists of approximately 132 acres located east of U.S. Highway 101. The airport has one runway (16/34) that is oriented in a north/south direction (160-340 degree magnetic heading). The runway is lighted and equipped to support day and night operations in visual flight rules (VFR) weather conditions. There are no published instrument approaches at Bandon State Airport. All airfield pavements are asphalt.

The runway is served by a full-length parallel taxiway on its west side. Additional taxiways connect adjacent landside facilities (aircraft apron and hangars) to the parallel taxiway. All existing aviation use structures and landside facilities on the airport are located on the west side of the runway, including off airport buildings that access the airport via “through-the-fence” agreements with ODA. Vehicle access to the west side of the airport is provided via Kehl Lane, which connects with Highway 101.

The published airfield elevation is 122 feet above mean sea level (MSL).⁵ The airport traffic pattern altitude is 1,000 feet above ground level (1,122 feet MSL). The airport utilizes standard left traffic patterns for both runway ends.

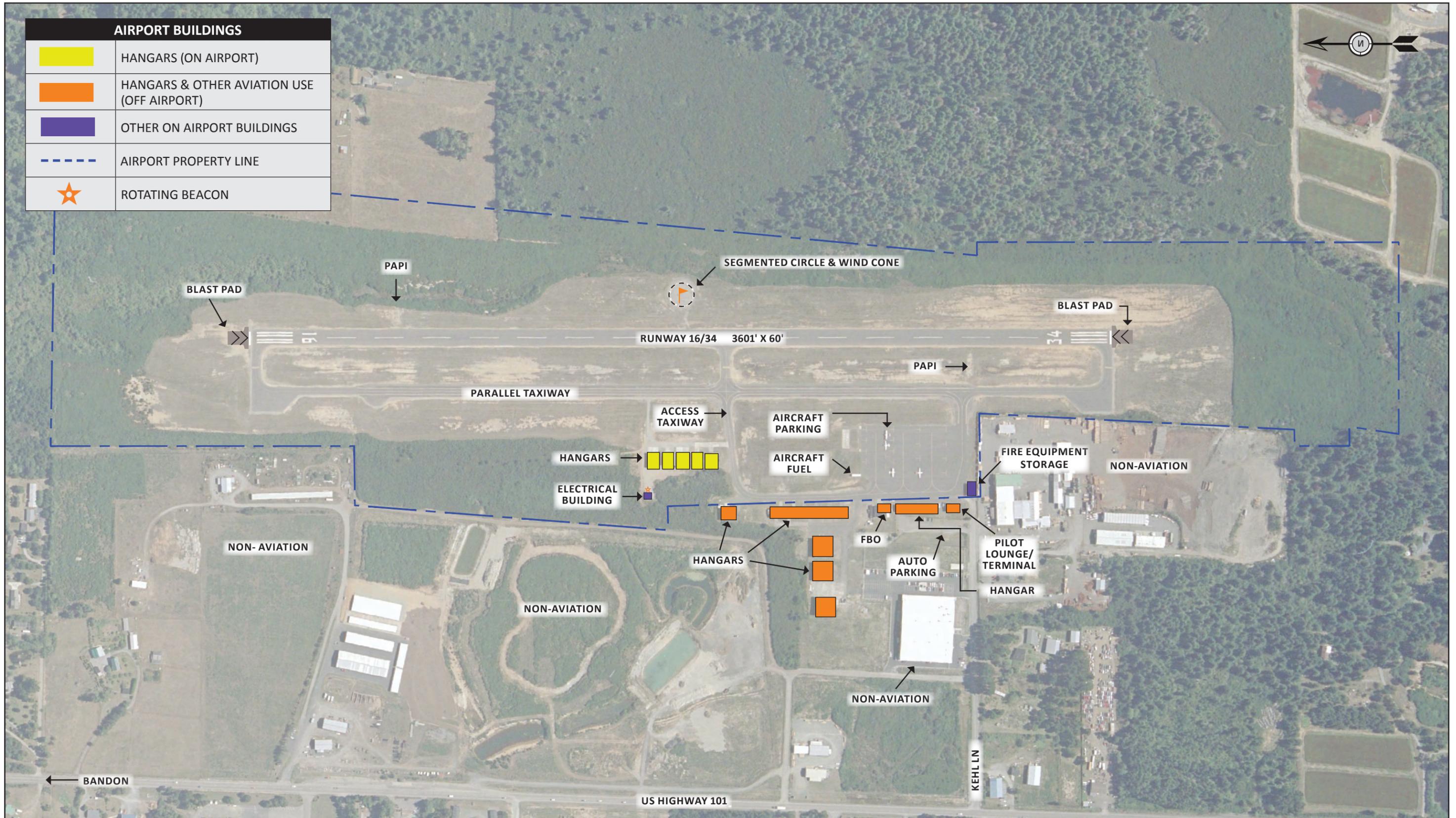
⁵ Airport/Facility Directory

Pilots use the airport Unicom/common traffic advisory frequency (CTAF) for communications on the ground and in the vicinity of the airport. **Table 2-2** summarizes airport data. **Figure 2-2** depicts existing airfield facilities.

TABLE 2-2: AIRPORT DATA

AIRPORT NAME/DESIGNATION	BANDON STATE AIRPORT (S05)
Airport Owner	Oregon Department of Aviation (ODA)
Date Established	1962 (per ODA historical records); 1940 activation listed in FAA records
Federal Airport Category	National Plan of Integrated Airport Systems (NPIAS): General Aviation FAA Airport Reference Code: B-I (as depicted on 2003 ALP)
State Airport Category	Category III – Regional General Aviation Airport (Oregon Aviation Plan)
Airport Acreage	132 Acres
Airport Reference Point (ARP) Coordinates	N 43° 05.19' W 124° 24.47'
Airport Elevation	122 feet Mean Sea Level (MSL)
Airport Traffic Pattern Configuration/Altitude	Left Traffic (Rwy 16/34); 1,122 feet above mean sea level (MSL) / 1,000 feet above ground level (AGL)
Airport Radio Communication	Common Traffic Advisory Frequency (CTAF) 122.8 MhZ.

AIRPORT BUILDINGS	
	HANGARS (ON AIRPORT)
	HANGARS & OTHER AVIATION USE (OFF AIRPORT)
	OTHER ON AIRPORT BUILDINGS
	AIRPORT PROPERTY LINE
	ROTATING BEACON



Runway

Runway 16/34 is 3,601 feet long and 60 feet wide with paved blast pads (80 feet wide, 100 feet long) at both ends. The blast pads are designed to reduce the effects of jet or prop blast generated by aircraft at the beginning of takeoff. The runway has three 90-degree exit taxiways that connect to a full length west parallel taxiway.

The runway has an asphalt surface with an effective gradient of 0.48 percent. The high point on the runway is located at its south end (listed at 123.0' MSL on the current airport layout plan drawing). The runway is equipped with edge lighting and visual approach aids. The runway was constructed in 1994 and is in “good” condition based on a 2013 pavement inspection.

The runway has nonprecision markings, and was noted in the 2003 ALP Report, will be sufficient to support a nonprecision GPS instrument approach in the future. There are currently no published instrument approaches to the airport. The runway markings (white paint) include runway designation numbers, centerline stripe, and threshold bars at both ends indicating the end of usable runway and the beginning of the blast pads, which are marked with yellow chevrons. Yellow taxiway lead-in lines are painted on the runway at the mid-runway exit taxiway. The markings are in good condition. **Table 2-3** summarizes existing runway facilities at Bandon State Airport.

TABLE 2-3: RUNWAY 16/34 DATA

Dimensions	3,601 x 60 feet Paved blast pad (Rwy 16): 100 x 80 feet Paved blast pad (Rwy 34): 100 x 80 feet
Bearing	N 358° (True)
Effective Gradient	0.48%
Surface/Condition	Asphalt/Good ⁶
Markings	Nonprecision Approach: Runway Landing Designation Numbers, Threshold End Bars, Centerline Stripe (white) Yellow Chevrons (Blast Pads)
Lighting	Runway Edge, Threshold, Visual Guidance Indicators, Runway End Identifiers
Signage	Taxiway/Runway Guidance Signs
Wind Coverage	On-site wind data not available 96.13 % at 10.5 knots (Based on North Bend wind data 2003 ALP)

⁶ Oregon Department of Aviation Maintenance Report 2013

Runway Pavement Strength

Runway 16/34 has a published pavement strength rating of 12,000 pounds for aircraft equipped with single-wheel landing gear.⁷ This pavement strength is consistent with runways designed to accommodate small airplanes (12,500 pounds or less).

Runway Wind Coverage

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

The FAA-recommended planning standard is that primary runways should be capable of accommodating at least 95 percent of wind conditions within the prescribed crosswind component. This component is based on a direct crosswind (90 degrees to the direction of flight) of 10.5 knots (12 miles per hour) for small aircraft and 13 knots (15 miles per hour) for larger general aviation aircraft. Aircraft are able to tolerate increasingly higher wind speeds as the crosswind angle is reduced and moves closer to the direction of flight.

There is no wind data available for the airport. Updated wind data was obtained for Southwest Oregon Regional Airport to create a new wind rose for use on the Airport Layout Plan (ALP). This information is provided for reference only and does not necessarily reflect local wind conditions at Bandon State Airport. Based on wind conditions in North Bend, Runway 16/34 has approximately 96 to 98 percent cross wind coverage for both large and small aircraft. The prevailing wind patterns in the area and the historic configuration of the original airfield, suggest that Runway 16/34 is aligned with the most common wind patterns and reflects the capabilities of the airport site.

Taxiways/Taxilanes

Bandon State Airport has an efficient taxiway system, including a full-length parallel taxiway on the west side of Runway 16/34 that provides access to the entire runway and adjacent landside facilities. A system of taxiways and taxilanes provide access to aircraft parking apron and hangar development areas on the airport. **Table 2-4** summarizes existing taxiway facilities. **Figure 2-2**, presented earlier in the chapter, depicts the major taxiways on the airfield. The striping and markings on the major taxiways are in good condition. The taxiways appear to be well maintained (vegetation control, crackfilling, etc.) and are generally in good condition.

⁷ FAA Airport/Facility Directory, FAA 5010 Airport Record Form

PARALLEL TAXIWAY

The parallel taxiway for Runway 16/34 is located on the west side of the runway and has three 90-degree exit taxiway connections to the runway. The parallel taxiway has aircraft hold areas located adjacent to both ends of the runway. The runway to parallel taxiway centerline-to-centerline separation is 225 feet. The number and location of the exit taxiways promotes efficient aircraft movement in the runway-taxiway system.

The parallel taxiway is 25 feet wide and the exit taxiways are 30 feet wide. The taxiways have centerline stripes. The exit taxiways have aircraft hold lines (yellow) located 125 feet from runway centerline, which coincides with the outer edge of the runway object free area (OFA) and obstacle free zone (OFZ). As noted earlier, yellow lead-in lines are located on the exit taxiways to guide aircraft exiting the runway to the taxiway. The parallel taxiway and exit taxiways are equipped with stake-mounted edge reflectors and the exit locations on the runway are identified with blue lenses on the medium intensity runway edge lights.

ACCESS TAXIWAYS AND TAXILANES

The landside facilities at Bandon State Airport are connected to the runway-taxiway system by two access taxiways.

North Access Taxiway

The north access taxiway extends from the parallel taxiway (mid-runway exit taxiway) to the main apron and hangar area. The taxiway is 25 feet wide and approximately 1,000 feet long. The taxiway travels west from the parallel taxiway approximately 400 feet then heads south toward the north end of the apron, where it connects to apron and hangar taxilanes. The taxiway is in “satisfactory” condition based on a 2013 pavement inspection. The taxiway has a yellow centerline stripe (good condition).

South Access Taxiway

The south access taxiway connects the parallel taxiway to south end of the main apron. The south access taxiway is 35 feet wide and approximately 133 feet long. The taxiway has a yellow centerline strip (good condition).

Apron Taxilanes

The main apron has a primary access taxilane that connects to the north and south access taxiways. The taxilane travels around the southern and western ends of the apron and connects to three east-west taxilanes serving four small airplane tiedown rows. The taxilanes provide access to aircraft tiedowns and hangars adjacent to the apron.

Hangar Taxilanes

Two sections of taxilane extend west of the north access taxiway to serve several hangars located off airport property. The section of taxilane adjacent to the T-hangar located near the south end of the main apron was rated “very poor” in a 2013 pavement inspection; the western section of taxilane providing access to several off-airport conventional hangars was rated “satisfactory.”

TABLE 2-4: TAXIWAY DATA (BANDON STATE AIRPORT)

TAXIWAY	DESCRIPTION	DIMENSIONS/CONFIGURATION
Parallel Taxiway	West Side Full Length Parallel Taxiway	3600 x 25’ with three exit taxiways; Aircraft hold areas located adjacent to both runway ends. Asphalt surface w/ centerline stripe (yellow); Threshold markings; Edge reflectors
Exit Taxiways (3)	90-degree Exit Taxiways for Runway 16/34 to Parallel Taxiway	Length: 183’ (Length of section between runway edge and Parallel Taxiway); North and South Exit Taxiway Width: 25 feet Mid Field Exit Taxiway Width: 30 feet Asphalt surface w/ centerline stripe; taxiway lead-in lines on runway; aircraft hold lines at each runway connection (125’ from runway centerline); Edge reflectors Exit Locations (distance from runway ends 16/34): North Exit Taxiway - Rwy 16 threshold (0’/3,600’) Mid field Exit Taxiway – (1,400’/1,600’) South Exit Taxiway – (3,600’/0’)
South Access Taxiway	Extends from Parallel Taxiway to Southernmost Apron area	133 x 35’ Asphalt surface w/ centerline stripe Edge reflectors
North Hangar Taxiway	Extension of Mid Field Exit Taxiway and leads to Northernmost Apron area	920 x 25’ Asphalt surface w/ centerline stripe
Main Apron Taxilanes	Taxilanes providing access to aircraft tiedowns, fueling area and hangars	Access Taxilanes within the main apron. Asphalt surface w/ centerline stripe

Aircraft Apron

Bandon State Airport has a one apron located on the west side of the runway that accommodates aircraft parking and fueling, and provides access to hangars and the general aviation terminal/fixed base operator (FBO) building. The apron has four east-west rows of aircraft tiedowns with 21 positions. The southern two rows of tiedowns (8 south facing positions) are designed to accommodate larger aircraft (multi-engine aircraft, single-engine turboprops, etc.). The northern two rows include 13 tiedowns for small airplanes in one single row (4 south facing positions) and one double row (9 north/south facing positions). **Table 2-5** summarizes the existing apron facilities at the airport.

TABLE 2-5: AIRCRAFT APRONS (BANDON STATE AIRPORT)

Main Apron	Approximately 260' by 440' Total Overall Area: Approximately 12,711 square yards - Asphalt Concrete Current Use: Small airplane parking, hangar frontage, and aircraft fueling <u>Tiedowns</u> : 21 small airplanes in multiple rows
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Airport Lighting and Signage

The airfield lighting at Bandon State Airport accommodates day-night operations in visual flight rules (VFR) weather conditions. Airfield lighting includes runway edge/threshold lighting, runway end identifier lights (REIL), precision approach path indicators (PAPI), a lighted windsock and segmented circle, and the airport beacon. Existing lighting systems are described in **Table 2-6**. The west parallel taxiway and exit taxiways are equipped with stake-mounted blue reflective markers.

TABLE 2-6: TYPES OF AIRPORT LIGHTING USED AT BANDON STATE AIRPORT

CATEGORY	TYPE	CONDITION
Airport Lighting	Airport Rotating Beacon (white/green dual lens); Lighted Wind Cone	Good
Runway Lighting	Medium Intensity Runway Lighting (MIRL) (white lenses) Runway End Identifier Lights (REIL) (white strobes)	Good
Visual Guidance Indicators	4-Light PAPI (red/white lenses) <ul style="list-style-type: none"> • Rwy 16: (P4L) 4 degree glide path* • Rwy 34: (P4L) 4 degree glide path 	Good* *Rwy 16 PAPI: "out of service indefinitely"
Taxiway Lighting	None (edge reflectors – fair condition)	Good
Airfield Signage	Unlighted Runway and Taxiway Location Signs	Good

Airport Lighting: The airport has a rotating beacon mounted on a tower support on the west side of the runway. Rotating beacons are used to indicate the location of an airport to pilots at night or during reduced visibility. The beacon provides sequenced white and green flashing lights (representing a lighted land airport) that rotate 360 degrees to allow pilots to identify the airport from all directions from several miles.

One internally illuminated wind cone is located on the east side of the runway, near mid-field, approximately 175 feet from the runway centerline. The wind cone is located in the segmented circle. The rotating beacon and lighted wind cone operate on dusk-dawn automatic switches and reportedly work normally.

Runway Lighting: Runway 16/34 has medium intensity runway edge lighting (MIRL) and runway end identifier lights (REIL) at both ends.

- **MIRL:** The MIRL system includes white edge lights (with blue lights located near the exit taxiways) and runway threshold lights. The threshold lights consist of two sets of four fixtures near each corner of the runway ends that are flush mounted in the runway blast pad pavement. The fixtures have split lenses (green/red) indicating the beginning and end of the useable runway.
- **REIL:** Runway 16 and 34 are equipped with runway end identifier lights (REIL), which consist of two high-intensity sequenced strobe lights that mark the end of the runway to assist pilots in establishing visual contact with the runway environment during periods of darkness or reduced visibility.
- **Visual Guidance Indicators:** Runways 16 and 34 are equipped with a 4 light precision approach path indicator (PAPI) system located on the left side of the approach end of the runway. Both PAPIs have a 4-degree glide path. The PAPI projects light along a standard glide path to a runway end from a single row of four lights indicating the aircraft's vertical position (above, below, or on glide path) relative to the glide path. The current FAA Airport/Facility Directory (A/FD) indicates the Runway 16 PAPI is out of service ("PAPI Rwy 16 OTS indef.").
- **Airfield Signage:** The runway-taxiway system has non-illuminated mandatory instruction signs at the aircraft holding positions at each of the taxiway connections with the runway. The signs are located to coincide with the painted aircraft hold lines on each taxiway that connects to the runway.

The MIRL, REIL, and PAPI lighting systems are pilot-activated using the common traffic advisory frequency (CTAF) 122.8 MHz. All airfield lighting reportedly functions normally.

Other Lighting: Overhead lighting is available in the terminal area and main aircraft parking aprons, the aircraft fueling area, and in various hangar areas. Hangars also have exterior wall-mounted flood lights.

Agricultural Aircraft Facilities

Bandon State Airport does not accommodate any locally-based aerial applicators and there are no loading or containment facilities located on the airport.

Airfield Pavement Condition

All airfield pavements at Bandon State Airport are constructed of asphaltic concrete (AC) over a crushed aggregate base/subbase. Historic pavement records indicate that the original airfield pavements were constructed in 1966. The main section of the parallel taxiway and the north access taxiway were constructed in 1966 and rehabilitated (overlay) in 1990. The original runway was replaced with new (shifted) runway in 1994. The south section of the main apron was paved in 1970 and rehabilitated (overlay) in 1990. The north section of the apron was paved in 1990. **Table 2-7** summarizes the typical section composition for each airfield pavement area.

TABLE 2-7: SUMMARY OF AIRFIELD PAVEMENT SECTIONS (BANDON STATE AIRPORT)

Runway 16/34	2" AC (1994); 6" Crushed Aggregate Base (1994); 5" Aggregate Subbase (1994)
Runway Blast Pads (both runway ends)	Not rated; Unknown section
Parallel Taxiway (north section and north AC hold area)	2" AC (1994); 6" Crushed Aggregate Base (1994); 5" Aggregate Subbase (1994)
Parallel Taxiway (middle section) and north AC hold area)	2" AC (1990); 2" AC (1966); Unknown Base
Parallel Taxiway (south section and south AC hold area)	2" AC (1994); 6" Crushed Aggregate Base (1994); 5" Aggregate Subbase (1994)
North Exit Taxiway	2" AC (1994); 6" Crushed Aggregate Base (1994); 5" Aggregate Subbase (1994)
Mid-field Exit Taxiway	2" AC (1994); 6" Crushed Aggregate Base (1994); 5" Aggregate Subbase (1994)
South Exit Taxiway	2" AC (1994); 6" Crushed Aggregate Base (1994); 5" Aggregate Subbase (1994)
Main Apron	South Section: 2" AC (1990); BST (1970) Unknown Base North Section: 2" AC (1990); 6" Aggregate Base (1990) Rear Section: 2" AC (1990); 6" Aggregate Base (1990)
North Access Taxiway	2" AC (1990); 2" AC (1966); 6" Unknown Base
South Access Taxiway (Apron)	2" AC (1990); 2" AC (1966); 6" Unknown Base
West Hangar Access	2" AC (1990); 6" Aggregate Base (1990)

As part of the Oregon Aviation System Plan, the Pavement Evaluation/Maintenance Management Program was developed and applied to all Oregon general aviation airports. The evaluation takes into account historical pavement condition index (PCI) ratings, pavement features, and current conditions. Through the use of MicroPAVER computer software, existing conditions data can be entered, and projections of future pavement condition and specific needs can be estimated. **Table 2-8** summarizes PCI ratings at Bandon State Airport based on inspections conducted in 2013 and the previous inspections conducted in 2009 and 2005. The PCI ratings are on a numerical scale of 0 to 100, which correspond to a series of qualitative conditions ranging from “Failed” to “Good.”

Based on the most recent pavement inspections performed in 2013, the majority of airfield pavements were rated “satisfactory” or better. The runway, north and south sections of the parallel taxiway, aircraft hold areas and the north section of the main apron were rated “good.” The center section of the parallel taxiway was rated “satisfactory”. All three exit taxiways were rated “good.” The south section of the main apron, north access taxiway, and west hangar access taxiway were rated “satisfactory.” The north half the apron and south taxiway connection were rated “good.” The western-most section of main apron located directly in front of the FBO/hangar building and the taxilanes adjacent to the T-hangar located near the northwest corner of the apron were rated “very poor.”

The rate of pavement deterioration documented between the 2009 and 2013 PCI inspections does not appear unusual based on local climate conditions or type of aircraft use. ODA conducts periodic vegetation control, crackfilling, sealcoating, and marking repainting of airfield pavements. The public use airfield pavements were crack sealed in 2011. The visual inspections of the airfield pavements showed the pavements were generally consistent with the most recent PCI inspections.

TABLE 2-8: SUMMARY OF AIRFIELD PAVEMENT CONDITION RATINGS

PAVEMENT SECTION	2013 PCI ¹	2009 PCI ¹	2005 PCI ¹	CURRENT CONDITION
Runway	98	98	100	Good (Crack Seal in 2011)
Parallel Taxiway (North Section, AC Hold Area, North Exit Taxiway)	100	100	100	Good (Crack Seal in 2011)
Parallel Taxiway (Middle Section)	77	94	90	Satisfactory (Crack Seal in 2011)
Parallel Taxiway (South Section, AC Hold Area, South Exit Taxiway)	99	98	100	Satisfactory (Crack Seal in 2011)
Center Exit Taxiway	98	100	96	Good (Slurry Seal in 2003)
North Access Taxiway	81	96	91	Satisfactory (Crack Seal in 2011)
Taxiway Connection (SE corner of main apron) to Parallel Taxiway	87	95	86	Good (Crack Seal in 2011)
North Section of Main Apron	86	86	94	Good (Crack Seal in 2011)
South Section of Main Apron	85	93	96	Satisfactory (Crack Seal in 2011)
Main Apron (west edge of apron; hangar/FBO access)	40	91	64	Very Poor (Slurry Seal in 2006)
Taxilane for adjacent T-hangar (NW corner of main apron)	39	56	57	Very Poor
Taxilane for Private Hangar	77	78	65	Satisfactory

1. The Pavement Condition Index (PCI) scale ranges from 0 to 100, with seven general condition categories ranging from “failed” to “good.” For additional details, see *Oregon Aviation System Plan Pavement Evaluation/Maintenance Management Program* (2014) for Bandon State Airport.

Landside Facilities

Bandon State Airport accommodates a variety of aviation-related buildings including aircraft storage hangars, commercial and mixed-use hangars, and a general aviation terminal/fixed base operator (FBO building). All airport buildings and aviation facilities are located on the west side of the runway, with the majority located off airport property. The west side of the airport abuts a variety of non-aviation buildings and associated facilities. **Table 2-9** summarizes existing airport hangars and other airport buildings. **Figure 2-2**, presented earlier in this chapter, depicts the existing buildings on the airport.

TABLE 2-9: BUILDINGS AT BANDON STATE AIRPORT

BLDG. NO.	BUILDING	OWNER	ON/OFF AIRPORT PROPERTY	EXISTING USE
1.	Terminal/Club House	Bandon Aero Club	Off	Pilot Facilities
2.	T-Hangar	Private	Off	Aircraft storage
3.	T-Hangar	Private	Off	Aircraft storage
4.	FBO Shop/Hangar	Bandon Aviation	Off	Commercial
5.	Conventional Hangar	Private	On	Aircraft storage
6.	Conventional Hangar	Private	On	Aircraft storage
7.	Conventional Hangar	Private	On	Aircraft storage
8.	Conventional Hangar	Private	On	Aircraft storage
9.	Conventional Hangar	Private	On	Aircraft storage
10.	Conventional Hangar	Private	Off	Aircraft storage
11.	Conventional Hangar	Private	Off	Aircraft storage
12.	Conventional Hangar	Private	Off	Aircraft storage
13.	Conventional Hangar	Private	Off	Aircraft storage
14.	Conventional Hangar	Private	Off	Aircraft storage
15.	Electrical Equipment Bldg.	ODA	On	Airport Operations
16.	Oregon Overseas Timber Co, Inc*	Private	Off	Industrial

*For reference only, not airport related.

Bandon State Airport has one fixed base operator (FBO) (Bandon Aviation) that offers aircraft maintenance services, aviation fueling, lounge, and restrooms.

Vehicle Access and Parking

VEHICLE ACCESS AND PARKING

Vehicle access to Bandon State Airport is provided via Kehl Road, which enters the airport near midfield directly from U.S Route 101. Kehl Road is a paved two lane roadway with centerline and edge stripes. The public portion of the roadway extends to a gravel parking area located immediately west of the general aviation terminal/fixed base operator (FBO) building. Additional unpaved areas for vehicle parking space are available adjacent to or between most individual hangars. The west aircraft tiedown apron can be accessed from the north side of the Fixed Based Operation building.

Airspace

Bandon State Airport currently operates under visual flight rules (VFR) conditions.

AIRSPACE CLASSIFICATIONS

Airspace within the United States is classified by the FAA as “controlled” or “uncontrolled” with altitudes extending from the surface upward to 60,000 feet above mean sea level (MSL). Controlled airspace classifications include Class A, B, C, D, and E. Class G airspace is uncontrolled.

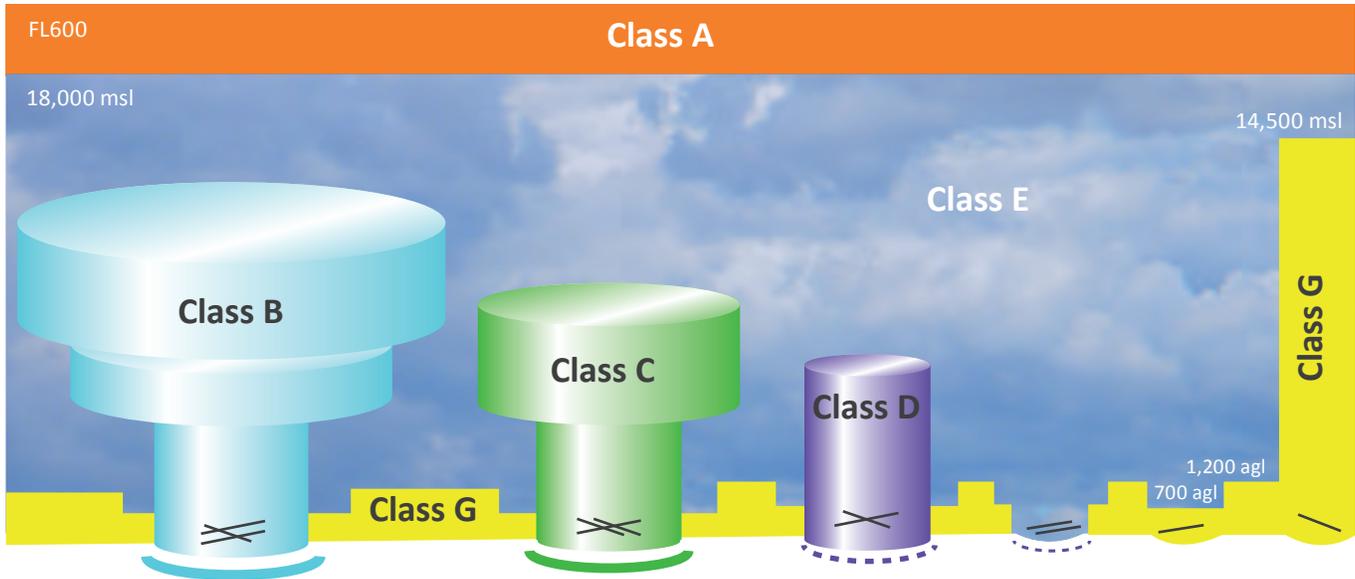
Aircraft operating within controlled airspace are subject to varying levels of positive air traffic control that are unique to each airspace classification. Requirements to operate within controlled airspace vary, with the most stringent requirements associated with very large commercial airports in high traffic areas. Uncontrolled airspace is typically found in remote areas or is limited to a 700 or 1,200-foot AGL layer above the surface and below controlled airspace. **Figure 2-3** illustrates and describes the characteristics of the airspace classifications defined by the FAA.

LOCAL AREA AIRSPACE STRUCTURE

Figure 2-4 depicts nearby airports, notable obstructions, special airspace designations and instrument flight rules (IFR) routes in the vicinity of Bandon State Airport, as identified on the [Klamath Falls Sectional Chart](#) and the [IFR Enroute Low Altitude Chart \(L-1/L-2\)](#).

Bandon State Airport is located in an area of Class E airspace that begins 14,500 feet above mean sea level (MSL) to 18,000 feet MSL. Class G airspace extends upward from the ground surface to the floor of the Class E airspace over the airport.

An area of Class E airspace that begins at 1,200 feet above the ground surface and extends upward to 18,000 feet MSL is located immediately adjacent (north and east) of the airport. This airspace is associated with the low altitude enroute (instrument) airway located 10 miles east of the airport and the terminal airspace for Southwest Oregon Regional Airport in North Bend. An area of Class E airspace that begins at 700 feet above the ground surface is located approximately 14 nautical miles north of the airport. This airspace also extends upward to 18,000 feet MSL and is associated with the terminal airspace at Southwest Oregon Regional Airport.



COMMUNICATION REQUIREMENTS AND WEATHER MINIMUMS

	Class A	Class B	Class C	Class D	Class E	Class G
Airspace Class Definition	Generally airspace above 18,000 feet MSL up to and including FL 600.	Generally multi-layered airspace from the surface up to 10,000 feet MSL surrounding the nation's busiest airports	Generally airspace from the surface to 4,000 feet AGL surrounding towered airports with service by radar approach control	Generally airspace from the surface to 2,500 feet AGL surrounding towered airports	Generally controlled airspace that is not Class A, Class B, Class C, or Class D	Generally uncontrolled airspace that is not Class A, Class B, Class C, Class D, or Class E
Minimum Pilot Qualifications	Instrument Rating	Student*	Student*	Student*	Student*	Student*
Entry Requirements	IFR: ATC Clearance VFR: Operations Prohibited	ATC Clearance	IFR: ATC Clearance VFR: Two-Way Communication w/ ATC	IFR: ATC Clearance VFR: Two-Way Communication w/ ATC	IFR: ATC Clearance VFR: None	None
VFR Visibility Below 10,000 msl**	N/A	3 Statute Miles	3 Statute Miles	3 Statute Miles	3 Statute Miles	Day: 1 Statute Mile Night: 3 Statute Miles
VFR Cloud Clearance Below 10,000 msl	N/A	Clear of Clouds	500 Below 1,000 Above 2,000 Horizontal	500 Below 1,000 Above 2,000 Horizontal	500 Below 1,000 Above 2,000 Horizontal	500 Below 1,000 Above 2,000 Horizontal***
VFR Visibility 10,000 msl and Above**	N/A	3 Statute Miles	3 Statute Miles	3 Statute Miles	5 Statute Miles	5 Statute Miles
VFR Cloud Clearance 10,000 msl and Above	N/A	Clear of Clouds	500 Below 1,000 Above 2,000 Horizontal	500 Below 1,000 Above 2,000 Horizontal	1,000 Below 1,000 Above 1 Statute Mile Horizontal	1,000 Below 1,000 Above 1 Statute Mile Horizontal

*Prior to operating within Class B, C or D airspace (or Class E airspace with an operating control tower), student, sport, and recreational pilots must meet the applicable FAR Part 61 training and endorsement requirements. Solo student, sport, and recreational pilot operations are prohibited at those airports listed in FAR Part 91, appendix D, section 4.

**Student pilot operations require at least 3 statute miles visibility during the day and 5 statute miles visibility at night.

***Class G VFR cloud clearance at 1,200 agl and below (day); clear of clouds.



LEGEND

	Airports with other than hard-surface runways		Class D Airspace
	Airports with hard-surfaced runways 1,500 ft. to 8,069 ft.		Class E Airspace with floor 700' above surface
	Airports with hard-surfaced runways greater than 8,069 ft.		Military Operations Area (MOA)
	Compass Rose (VOR/DME or VORTAC)		Prohibited, Restricted, Warning, and Alert Areas
	VOR or RNAV Airways		VOR/ VORTAC
	Class E Airspace (surface)		

Radio communication is not required for visual flight rules (VFR) operations in Class E airspace, although pilots are encouraged to use the common traffic advisory frequency (CTAF) when operating at the airport. Aircraft are required to obtain an air traffic control (ATC) clearance prior to operating in Class E airspace during instrument flight rules (IFR).

The North Bend (OTH) VORTAC is located 22 miles northeast and the Crescent City (CEC) VORTAC is located 79 miles south-southeast of the airport. These navigational aids support Victor 27 (V27), a low altitude enroute instrument airway that passes within 10 nautical miles east of the airport. The minimum enroute altitude (MEA) for the section of the airway passing nearest the airport is 6,400 feet MSL.

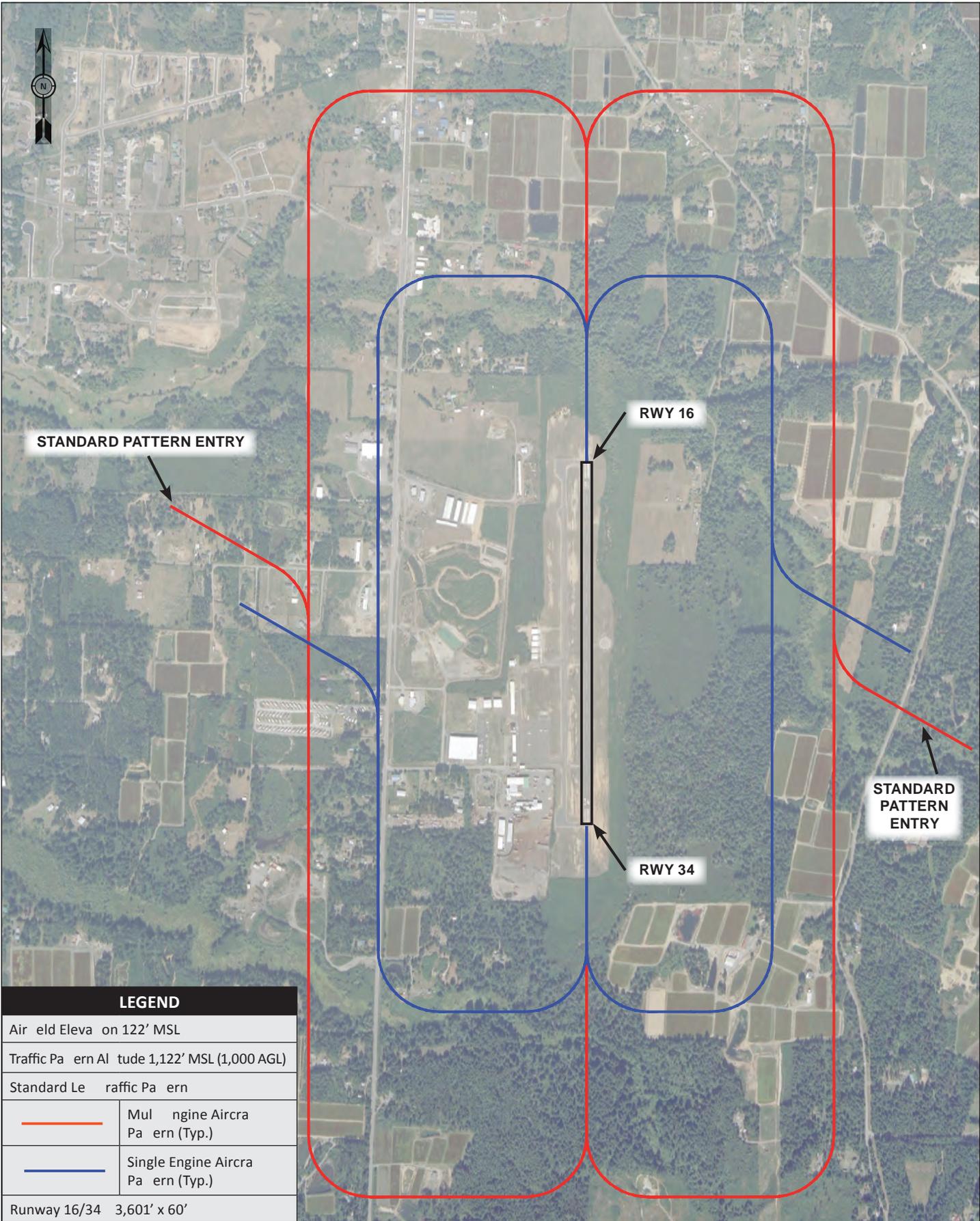
The local airport traffic pattern altitude is 1,000 feet above ground level (AGL) (1,122' MSL) with standard left traffic on Runway 16 and 34. The traffic patterns are located on the east and west sides of the runway, as depicted in **Figure 2-5**.

SPECIAL USE AIRSPACE/NEARBY OBSTACLES

The Dolphin North Military Operations Area (MOA) lies directly over Bandon and extends several miles offshore to the west near the edge of the Air Defense Identification Zone (ADIZ) for the contiguous United States, and approximately 35 nautical miles east. This MOA begins at 11,000 ft AGL and extends upward to 18,000 feet MSL. MOAs are designated to segregate VFR and IFR traffic from military operations. When a MOA is active, IFR traffic may be cleared through the area when air traffic control can ensure IFR separation; otherwise traffic will be rerouted. Although VFR operations are not restricted in an MOA, pilots are advised to exercise extreme caution while flying within, near, or below an active MOA. Prior to entering an active MOA, pilots are encouraged to contact the controlling agency for traffic advisories due to the frequently changing status of these areas.

Pilots are requested to maintain a minimum altitude of at least 2,000 feet AGL over state parks, wilderness areas, wildlife refuges, and other sensitive areas. The nearest areas of this type are the Bandon Marsh and Oregon Islands National Wildlife Refuges located within 3 miles of Bandon State Airport.

Numerous towers, radio towers, and electrical transmission lines depicted on the aeronautical chart are located in the vicinity of Bandon State Airport (<1 mile to 9 miles). The above ground heights of the towers range between 258 and 320 feet; heights for the electrical transmission lines are not provided, although tower heights exceeding 200 feet are common.



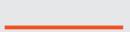
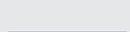
STANDARD PATTERN ENTRY

RWY 16

STANDARD PATTERN ENTRY

RWY 34

LEGEND

Air field Elevation on 122' MSL	
Traffic Pattern Altitude 1,122' MSL (1,000 AGL)	
Standard Left Traffic Pattern	
	Multi-engine Aircraft Pattern (Typ.)
	Single Engine Aircraft Pattern (Typ.)
Runway 16/34 3,601' x 60'	

Navigational Aids/Weather Data

There are no electronic navigational aids or instrument approach procedures located on the airport. The North Bend VORTAC 22.4 nautical miles north is the nearest conventional ground based navigational aid to Bandon State Airport. The Empire nondirectional beacon (“LOM”) is located 21 miles north-northeast and the Roseburg VOR/DME is located 47 nautical miles east-northeast. The nearest instrument approach procedures available are located 21 nm north-northeast at Southwest Oregon Regional Airport. Table 2-9 summarizes existing navigational aids and related items.

Bandon State Airport does not have on-site weather observation capabilities, such as an automated weather observation system (AWOS). The nearest airport weather observation data is located in North Bend and Gold Beach (21 to 40 miles from Bandon).

TABLE 2-10: NAVIGATIONAL AIDS AND RELATED ITEMS

TYPE	FACILITIES
Electronic Navigational Aids	North Bend VORTAC (21 nm NNE) 112.1 MHz Empire NDB (LOM) (21 nm NNE) 378 LHz Roseburg (RBG) VOR/DME 47 nm ENE) 108.2 MHz
Weather Observation	None on Field OTH AWOS-3 (North Bend – 21 nm NNE) (135.075 MHz) Hazardous Inflight Weather Advisory Service (HIWAS) (North Bend – 21 nm NNE) (112.1 MHz) 4S1 AWOS-3 (Gold Beach - 40.1 nm S) (118.15 MHz)
Communication	Unicom/Common Traffic Advisory Frequency (CTAF) (122.8 MHz)

Airport Support Facilities/Services

AVIATION FUEL

100LL aviation gasoline (AVGAS) is available at the airport. Jet fuel is currently not available. A 12,000-gallon aboveground double wall storage tank (100LL) and dispensing facilities were installed near the south end of the main apron in 2000. Bandon Aviation is responsible for dispensing this fuel, and the tanks are owned by Bandon Aero Club.

Public Restrooms

A public use restroom is located in the Bandon Aero Club.

Fencing and Security

The airport has wire fencing located along portions of its property line.

Utilities

The airport has electric, water, and telephone service. The Bandon Aero Club has an individual septic system.

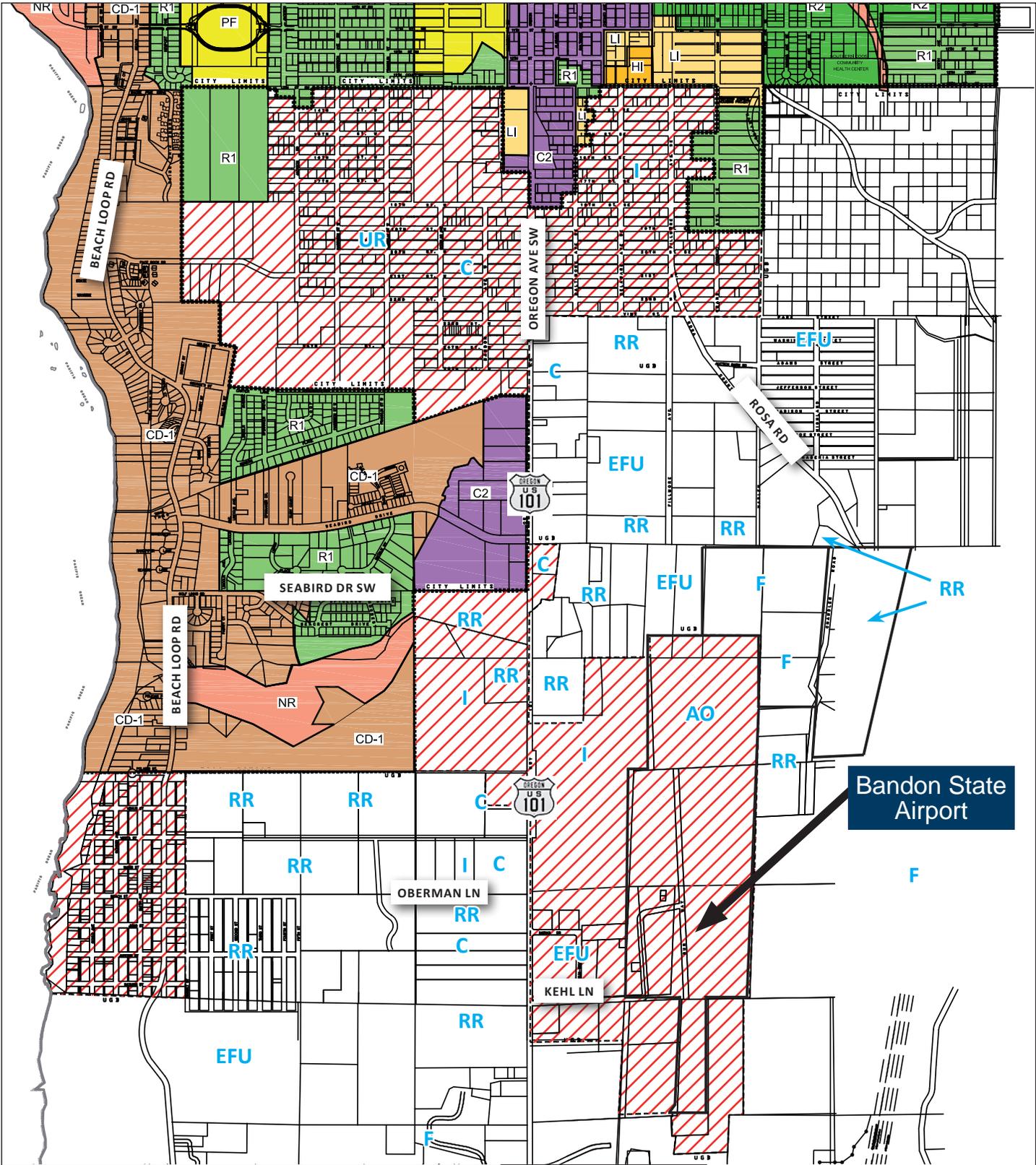
Water service is provided by the City of Bandon through local wells. Bandon Power provides the electrical power and telephone service is provided by Verizon.

Land Use Planning and Zoning

Bandon Airport is located outside the City of Bandon city limits, within the City's urban growth boundary (UGB). Land use controls and zoning for the airport and in the immediate vicinity of the airport are administered by Coos County. Bandon State Airport is zoned "Airport Operations" (AO) by Coos County. Land uses on the airport include airfield facilities, aircraft hangars and the airport fixed base operator (FBO). Coos County and the City of Bandon have also established airport overlay zoning based on the defined FAR Part 77 airspace for Runway 16/34. The current Coos County zoning ordinance for the airport and the associated overlay zones are included in **Appendix C**.

The zoning in the vicinity of the airport accommodates a variety of forest, exclusive agricultural and industrial uses. There are areas of rural residential zoning west of Runway 16 end. Land to the immediate north, south and east of the airport are not within the city limits and therefore are subject to Coos County Zoning rules. A detailed description of current zoning, airport overlay zoning and land use is presented in Chapter 9 (Land Use Planning).

Zoning for the airport and its surrounding area is depicted in **Figure 2-6**.



CITY OF BANDON ZONING MAP LEGEND

R1	RESIDENTIAL 1	CD-1	CONTROLLED DEVELOPMENT ZONE 1	CD-R2	CONTROLLED DEVELOPMENT RESIDENTIAL 2
R2	RESIDENTIAL 2	CD-2	CONTROLLED DEVELOPMENT ZONE 2	PF	PUBLIC FACILITY
C1	OLD TOWN COMMERCIAL	CD-3	CONTROLLED DEVELOPMENT ZONE 3	W	WATER ZONE
C2	GENERAL COMMERCIAL	CD-R1	CONTROLLED DEVELOPMENT RESIDENTIAL 1	NR	NATURAL RESOURCES OPEN SPACES
C3	MARINE COMMERCIAL				
LI	LIGHT INDUSTRIAL				
HI	HEAVY INDUSTRIAL				

UGB	URBAN GROWTH BOUNDARY
---	CITY LIMITS

COOS COUNTY LEGEND

UNINCORPORATED COOS COUNTY	EFU- EXC. FARM USE	AO- AIRPORT OPERATIONS	UR- URBAN RESIDENTIAL
	F- FOREST	RR- RURAL RESIDENTIAL	
	C- COMMERCIAL	I- INDUSTRIAL	



Chapter 3 – Aviation Activity Forecasts



Chapter 3 – Aviation Activity Forecasts

The overall goal of aviation activity forecasting is to prepare forecasts that accurately reflect current conditions, relevant historic trends, and provide reasonable projections of future activity, which can be translated into specific airport facility needs anticipated during the next twenty years and beyond.



Introduction

This chapter provides updated forecasts of aviation activity for Bandon State Airport (S05) for the twenty-year master plan horizon (2014-2034). The forecasts presented in this chapter are consistent with Bandon State Airport's current and historic role as a community general aviation airport.

Unless specifically noted, the forecasts of activity are unconstrained and assume that Oregon Department of Aviation will be able to make the facility improvements necessary to accommodate anticipated demand. Through the evaluation of airport development alternatives later in the master plan, ODA will consider if any unconstrained demand will not or cannot be reasonably met.

The FAA-defined airport master plan forecasting process for general aviation airports is designed to address elements critical to airport planning by focusing on two key activity segments: based aircraft and aircraft operations (takeoffs and landings). Detailed breakdowns of these are also provided including aircraft fleet mix, activity peaking, distribution of local and itinerant operations, and the determination of the critical aircraft, also referred to as the design aircraft.

The design aircraft represents the most demanding aircraft type or family of aircraft that uses an airport on a regular basis (a minimum of 500 annual takeoffs & landings). The existing and future design aircraft are used to define the airport reference codes (ARC) to be used in airfield planning. FAA airport design standards are organized into several different ARC groupings, each reflecting the physical requirements of that aircraft type. The activity forecasts also provide consistency in evaluating future demand-based facility requirements such as runway and taxiway capacity, aircraft parking and hangar capacity, and other planning evaluations.

Aviation activity can be affected by many influences on the local, regional, and national levels, making it virtually impossible to predict year-to-year fluctuations of activity over twenty years with any certainty. In addition, major unexpected events such as the terrorist attacks of 9/11 2001 or the recent economic recession have the potential to render any forecast obsolete when the effects of these events are deep or prolonged. Therefore, it is important to remember that aviation activity forecasts serve only as guidelines. Planning must be flexible enough to respond to a range of unforeseen developments – either positive or negative. The use of development reserves for demand-driven facility needs such as hangar space or aircraft parking provides airport management with the ability to respond to unanticipated demand and preserve long-term aviation use areas on the airport.

The following forecast analysis for Bandon State Airport was produced following these basic guidelines. Existing forecasts were examined and compared against current and historic activity. The historical aviation activity was examined along with other factors and trends that can affect demand. The intent is to provide an updated set of aviation demand projections for Bandon State Airport that accurately assess activity and support airport management in maintaining a viable, efficient, and cost-effective facility that meets the area's air transportation needs.

Forecast Process

The Federal Aviation Administration (FAA) provides guidance on forecasting aviation activity in airport master planning projects. **FAA Advisory Circular (AC) 150/5070-6B, Airport Master Plans**, outlines seven standard steps involved in the forecast process:

- 1) **Identify Aviation Activity Measures:** The level and type of aviation activities likely to impact facility needs. For general aviation, this typically includes based aircraft and operations.
- 2) **Review Previous Airport Forecasts:** May include the FAA Terminal Area Forecast (TAF), state or regional system plans, and previous master plans.
- 3) **Gather Data:** Determine what data are required to prepare the forecasts, identify data sources, and collect historical and forecast data.
- 4) **Select Forecast Methods:** There are several appropriate methodologies and techniques available, including regression analysis, trend analysis, market share or ratio analysis, exponential

smoothing, econometric modeling, comparison with other airports, survey techniques, cohort analysis, choice and distribution models, range projections, and professional judgment.

- 5) **Apply Forecast Methods and Evaluate Results:** Prepare the actual forecasts and evaluate for reasonableness.
- 6) **Summarize and Document Results:** Provide supporting text and tables as necessary.
- 7) **Compare Forecast Results with FAA's TAF:** Follow guidance in FAA Order 5090.3C, Field Formulation of the National Plan of Integrated Airport Systems. In part, the Order indicates that forecasts should not vary significantly (more than 10 percent) from the TAF. When there is a greater than 10 percent variance, supporting documentation should be supplied to the FAA. The aviation demand forecasts are then submitted to the FAA for their approval.

Master Plan forecasts for operations and based aircraft for general aviation airports are considered to be consistent with the TAF if they meet the following criteria:

Where the 5- or 10-year forecasts exceed 100,000 total annual operations or 100 based aircraft:

- a. Forecasts differ by less than 10 percent in the 5-year forecast and 15 percent in the 10-year period, or
- b. Forecasts do not affect the timing or scale of an airport project, or
- c. Forecasts do not affect the role of the airport as defined in the current version of FAA Order 5090.3C.

When the 5- or 10-year forecast is for less than 100,000 total annual operations or 100 based aircraft, the forecast does not need to be reviewed at FAA Headquarters, but the data should be provided to the FAA for the annual update of the TAF.

National General Aviation Activity Trends

The first decade of the 21st Century was tumultuous for General Aviation (GA) and the first half of the second decade has improved only slightly. The industry was battered by poor economic conditions and steadily rising fuel prices that slowed growth and negatively impacted elements such as aircraft manufacturing, on-demand air travel, aircraft ownership, and aircraft utilization levels. Ongoing concerns over the potential replacement and future availability of 100LL aviation gasoline (AVGAS) have also created uncertainty within general aviation. On a national level, most measures of GA activity declined sharply through the “great recession” and have only recently started to show modest signs of improvement.

In recent years, aircraft manufacturing has shown positive gains after an extended period of weak sales. Worldwide GA aircraft deliveries in 2013 totaled 3,373 units, an increase of 4.3 percent over the previous

year, but about 15 percent below recent peak of shipments in 2008.¹ Shipments of GA turbine aircraft (fixed wing and helicopters) were nearly double the number of piston engine aircraft shipments in 2013.

The adaption of both turbine and diesel engines for small general aviation aircraft by several established manufacturers is positive indication that evolving engine technology may be a significant factor in the long term future of general aviation. In addition, the resurgence of unleaded automobile gasoline powered small aircraft engines may provide a reliable power source for a growing Light Sport Aircraft (LSA) and experimental aircraft fleet. The FAA's long-term forecasts predict that the U.S. active GA aircraft fleet will grow modestly at an average annual rate of 0.5 percent between 2013 and 2034. As depicted in **Figure 3-1**, the active GA fleet is expected to increase from 202,865 aircraft in 2013 to 225,700 in 2034 (+22,835) which is an overall increase of approximately 11 percent. However, within that overall growth is a projected decline in active single engine piston aircraft (-7.9%) and multi-engine piston aircraft (-9.5%). These declines reflect attrition of an aging fleet which is not being offset by new aircraft production. Encouraging areas within the GA fleet are found in turboprops (particularly single engine) (+41%), experimental aircraft (+36%), sport aircraft (+131%), and business jets (+85%) growth through 2034.

Data maintained by the FAA show significant system-wide declines of several key general aviation activity indicators between 2000 and 2013 (AVGAS consumption -39%; piston aircraft hours flown -38%; active piston aircraft -18%; active GA pilots -7%). The FAA's updated long term forecasts² are tempered to reflect current and recent historic conditions. Although the FAA maintains a moderately favorable long-term outlook, many of the activity segments associated with piston engine aircraft and AVGAS consumption are not projected to return to "pre-recession" levels until the 2025 to 2034 timeframe. Although some segments of general aviation are expected to grow at moderately high rates, most measures of the general aviation industry suggest modest, sustained growth in the range of 1 to 2 percent annually is expected over the next 20 years. The FAA's annual growth assumptions for individual general aviation activity segments are summarized in **Table 3-1**.

These expectations reflect a variety of industry specific factors and broad-based measures and forecasts of economic health such as gross domestic product (GDP), consumer price index, oil prices, and interest rates. The FAA acknowledges several risks to its forecast assumptions related to rising oil prices, public perceptions of business and corporate aviation, broad national and international governmental fiscal policy concerns, and environmental concerns. The FAA notes that improvement for business aviation is largely based upon the future prospects of economic growth and corporate profits.

¹ General Aviation Manufacturers Association (GAMA), 2013 Delivery Report

² FAA Aerospace Forecast Fiscal Years 2014-2034

FIGURE 3-1: US ACTIVE GENERAL AVIATION AIRCRAFT FORECAST

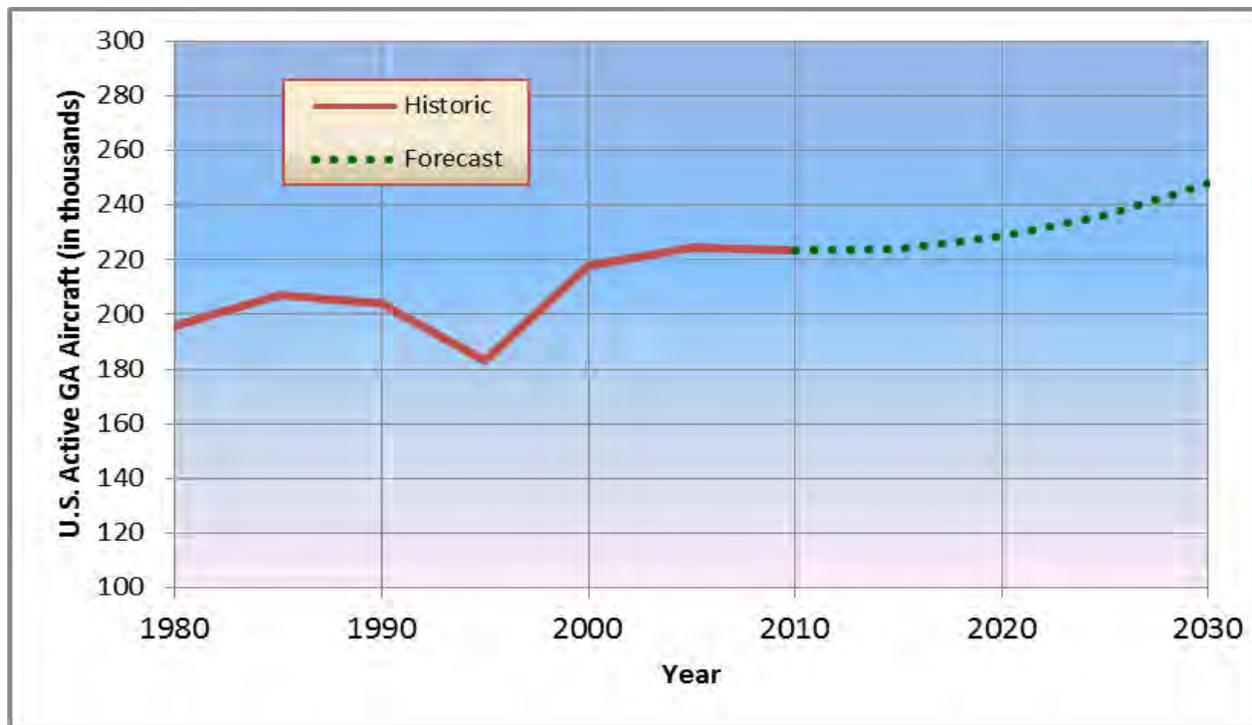


TABLE 3-1: FAA LONG RANGE FORECAST ASSUMPTIONS (U.S. GENERAL AVIATION)

ACTIVITY COMPONENT	FORECAST ANNUAL AVERAGE GROWTH RATE (2013-2034)
Components with Annual Growth Forecast < 0%	
Single Engine Piston Aircraft in U.S. Fleet	-0.4%
Multi-Engine Piston Aircraft in U.S. Fleet	-0.5%
Hours Flown - GA Fleet (Piston AC)	-0.6%
Student Pilots (Indicator of flight training activity)	-0.2%
AVGAS (Gallons consumed - GA only)	-0.2%
Components with Annual Growth Forecast < 1%	
Private Pilots	0.1%
Commercial Pilots / Airline Transport Pilots	0.6% / 0.5%
Instrument Rated Pilots	0.3%
Active Pilots (All Ratings, excluding Airline Transport)	0.4%
GA Operations at Towered Airports (all AC types)	0.5%
Active GA Fleet (# of Aircraft)	0.5%
Components with Annual Growth Forecast 1%-2%	
Experimental Aircraft in U.S. Fleet	1.5%
Turboprop Aircraft in U.S. Fleet	1.6%
Piston Helicopters in U.S. Fleet	1.7%
Components with Annual Growth Forecast >2%	
Sport Pilots	5.6%
Turbine Helicopters in U.S. Fleet	3.0%
Light Sport Aircraft in U.S. Fleet	4.1%
Turbojet Aircraft in U.S. Fleet	3.0%
Hours Flown - GA Fleet (Turbine AC)	3.3%
Hours Flown – Experimental AC	2.6%
Hours Flown – Light Sport AC	5.1%
Jet Fuel (Gallons consumed – GA only)	3.0%

Source: FAA Long Range Aerospace Forecasts (FY 2014-2034)

Airport Service Area

The airport service area refers to the geographic area surrounding an airport that defines its activity base. The population, economic characteristics, and capabilities of competing airports within an airport's service area are important factors in defining locally-generated demand for aviation facilities and services, and also influence an airport's ability to attract transient aircraft activity.

A 30- or 60-minute surface travel time is used to approximate the boundaries of a service area for a typical general aviation airport. Bandon State Airport is the only FAA funded (National Plan of Integrated Airport Systems – NPIAS) airport in Coos County, which creates a large geographic service area. **Figure 3-2** illustrates the approximate boundary of an approximate 30- and 60-minute drive from the local area, which encompasses Coos County, and areas of adjacent Lane and Curry Counties.

Competing airports located beyond a 30- or 60-minute travel time typically have less impact on local airport activity due to the redundancy provided by closer facilities. In contrast, the service area for a commercial airport often extends beyond two hours due to the relatively small number of airports with scheduled airline service. With numerous airports nearby, service areas often overlap, creating competition between airports for items such as hangar space, fuel, and aviation services. These items are sensitive to cost, convenience, and the quality of facilities or services for both locally-based and transient users.

Historically, Bandon State Airport has provided general aviation access to Bandon and the south-central Oregon coast for small single-engine and multi-engine aircraft, and small/medium business class turbine aircraft (turboprops and business jets) capable of operating on its runway (currently 3,600 feet).

Southwest Regional Airport (OTH), located 30 miles north in North Bend, provides scheduled air service access to the region and is capable of accommodating both large and small general aviation aircraft. The reduction in scheduled commercial air service at OTH since 2008 has increased demand for general aviation access within local service area. In particular, the elimination of direct flights to/from Portland via Horizon Air and Skywest has significantly reduced scheduled airline access in the region.

The development and sustained success of the Bandon Dunes Golf Resort has stimulated air traffic activity (both commercial and general aviation) within the local air service area. Between 1999 and 2012, Bandon Dunes opened five courses and has become a world-class golf destination. The Resort indicates that they have experienced significant growth in business as the facility has grown and expects demand to continue to increase in the future.

According to ODA records, the number of based aircraft Bandon State Airport has increased from 29 in 2003 to 37 in 2014 (+27.6 percent overall increase; 2.24% annual average growth). The majority of these aircraft are small single-engine or multi-engine piston, with one multi-engine turboprop. The average annual growth during the period significantly outpaced both local and county population growth rates and demonstrates strong market conditions within the local airport service area. Based on the composition of

the local air service area, Bandon State Airport is ideally situated to serve aircraft owners located within 30 minutes of Bandon and transient users visiting the local area.

With the continued success and growth of Bandon Dunes Golf Resort generating air travel demand, Bandon State Airport is strategically positioned to accommodate increased general aviation activity in the future.

Looking forward, the ability to provide additional runway length, onsite weather observation, instrument approach capabilities, and adequate landside development area at Bandon State Airport will determine the Airport's ability to attract a larger share of general aviation activity within its service area. The availability of services that cater to business aircraft owners/operators such as jet fuel, aircraft servicing, ground transportation, and competitive airport user fees are also important factors in generating both locally-based and transient activity.

Table 3-2 lists the publicly-owned, public use airports within a 50 nautical mile (air miles) radius of Bandon State Airport. It is noted that some of the public use airports listed provide competitive facilities and services with master plans that provide for future facility expansion. The relevance of the nearby airports is greatest along the coast, based on typical weather conditions which often limit flights over the mountainous Coast Range.

-  Approximate 30 minute travel driving time to/from Bandon State Airport
-  Approximate 60 minute travel driving time to/from Bandon State Airport
-  Other public use airports in vicinity

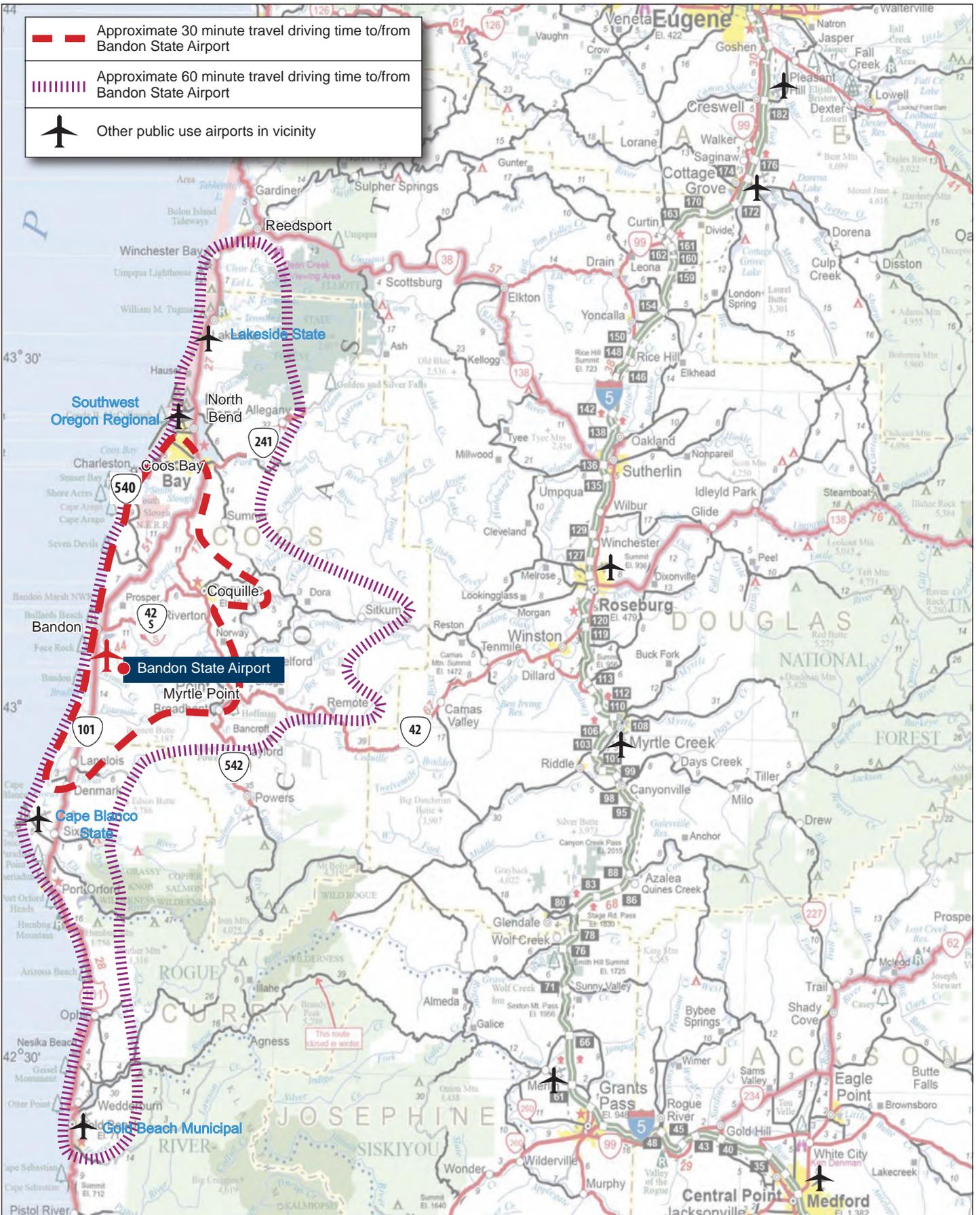


TABLE 3-2: PUBLIC USE AIRPORTS IN VICINITY OF BANDON STATE AIRPORT (WITHIN 50 NAUT. MILES)

AIRPORT	LOCATION (AIR MILES)	RUNWAY DIMENSION (FEET)	SURFACE	LIGHTED RUNWAY?	FUEL AVAILABLE?
Cape Blanco State (5S6)	14.5 NM South	5,100 x 150	Asphalt	No	No
Gold Beach Municipal (4S1)	40.3 NM South	3,237 x 75	Asphalt	Yes	Yes
Southwest Oregon Regional (OTH)	21.0 NM North	5,980 x 150	Asphalt	Yes	Yes
Lakeside State (9S3)	31.4 NM North	2,150 x 100	Turf	No	No
Roseburg Regional (RBG)	46.9 NM East	5,001 x 100	Asphalt	Yes	Yes
Myrtle Creek Municipal (16S)	48.2 NM East	2,600 x 60	Asphalt	Yes	Yes

Several additional factors that have potential relevance to activity forecasting at Bandon State Airport are described below.

Southwest Regional Airport (OTH). Southwest Regional Airport (OTH) is the largest airport located within the service area for Bandon State Airport, accommodating both commercial and general aviation activity with a full range of facilities and services. It is assumed that OTH will continue to accommodate the region's scheduled commercial air service and a significant segment of general aviation activity based on its airfield capabilities and services.

The recently completed master plan³ for OTH included aviation activity forecasts that projected nominal or no growth in general aviation activity (based aircraft and operations) for the 2010-2030 period. The OTH master plan did not include any original forecasts for general aviation activity, instead relying on the existing FAA Terminal Area Forecasts (TAF). The TAF projects based aircraft at OTH to increase from 51 to 62 (+11), while annual general aviation operations were projected to remain unchanged at 6,994 from 2012 through 2030 (0% annual growth). Although significant growth in activity is not projected, OTH will continue to be the primary competitor within the local airport service area for local and transient general aviation users.

Instrument Flight Rules (IFR) Activity. Bandon State Airport is not currently equipped with instrument approach capabilities, although a Global Positioning System (GPS) approach is identified as a future improvement on the 2004 Airport Layout Plan drawing.

³ Southwest Regional Airport Master Plan (Reynolds Smith & Hill, 2013)

To support the forecast analysis for the Bandon State Airport Master Plan, a review of recent historic instrument operations at OTH was conducted to help understand the composition of general aviation flight activity occurring within the local airport service area. For relevance to Bandon State Airport, commercial (passenger and cargo/express) activity was separated.

Flight activity data for aircraft operating under instrument flight rules in the national airspace system is tracked by FlightAware, a company that developed live flight tracking services for commercial and general aviation. Instrument flight plan data for calendar year 2007 and the twelve months ending July 2014 are summarized in **Table 3-3**. The data captures all civil aircraft filing instrument flight plans listing OTH either as the originating airport or the destination airport and provides verification of business class aircraft activity (commonly operating under IFR flight plans) at OTH. Military aircraft are not included in the FAA instrument flight plan data. The two years of data provide an indication activity on both sides of the recent economic recession, although it appears that current activity is about 25 percent lower than 2007.

TABLE 3-3: GA INSTRUMENT OPERATIONS – SOUTHWEST OREGON REGIONAL AIRPORT (2007/2014)

ARC	REPRESENTATIVE AIRCRAFT	2007	2014 ¹
A-I	Cessna 182/Beechcraft Baron 55/TBM700	578	902
B-I	Beechcraft Baron 58/Beechcraft King Air 90/Cessna Citation Jet (CJ1)	1,365	279
A-II	Cessna Caravan/Pilatus PC12	102	117
B-II	Cessna Citation Bravo/Beechcraft King Air 200/Falcon 50	1,028	797
B-III	Boeing BBJ	13	0
C-I	Hawker HS125, Learjet 31	53	15
C-II	Bombardier Challenger	321	239
D-I	Learjet 35	88	94
D-II	Gulfstream IV, V	20	38
D-III	Bombardier Global Express	3	6
--	Blocked (assumed to be 70% B-I/B-II Jet and 30% C-I/D-I/D-II Jet)	350	868
--	Helicopter	1	8
	Total GA Instrument Operations	3,926	2,997

Source: FlightAware 12 months ending July 3, 2014

Emergency Response. In addition to the activities typically associated with a general aviation airport, Bandon State Airport also has a potential role in emergency response planning and operations. The primary surface access route on the Oregon coast is U.S. Highway 101. In the event of a natural disaster or any event that could result in an extended closure of Highway 101 or its major bridges, Bandon State Airport is positioned to provide immediate access to the Oregon coast for coordinated response support, transportation of relief supplies, medical evacuation and other related functions. Bandon State is one of only four public use airports

located along the Oregon coast with an airfield elevation of at least 100 feet above mean sea level (MSL), which could be a significant factor in its ability to support emergency operations, particularly in a Tsunami event.

Socioeconomic Trends and Forecasts

AREA ECONOMY

Historically, downturns in general aviation activity often occur during periods of weak economic conditions and growth typically coincides with favorable economic conditions. It is evident that the recent economic recession and the slow recovery that followed, has constrained general aviation activity locally, statewide, and throughout the national airport system. However, as indicated in the FAA's national long term aviation forecasts, the overall strength of the U.S. economy is expected to sustain economic growth over the long-term, which will translate into modest-to-moderate growth in aviation activity.

Employment within Coos County is influenced by government, with approximately 20 percent associated with federal, state, or local government. The 2013 per capita income in Coos County was \$33,816, below Oregon's per capita income level of \$39,286. Coos County's economy is vulnerable to seasonal unemployment, which historically has been associated with the wood products industry and now appears to also reflect seasonal tourism.

According to Oregon Employment Department data, the leading employment sectors in Coos County include:

- 1) Federal Government (20%)
- 2) Services (37%)
- 3) Retail Trade (19%)
- 4) State & Local Government (17%)
- 5) Finance, Insurance & Real Estate (7%)
- 6) Construction (6%)
- 7) Manufacturing (6%)
- 8) Transportation/Utilities (3%)

Table 3-4 summarizes historic and forecast employment and income data for Coos County, the State of Oregon, and the United States.

TABLE 3-4: PERSONAL INCOME PER CAPITA & EMPLOYMENT DATA

Area	HISTORIC		FORECAST			
	2000	2013	2019	2024	2029	2034
Per Capita Income						
U.S.	\$27,000	\$43,597	\$54,251	\$68,829	\$88,534	\$114,566
State of Oregon	\$25,560	\$39,286	\$48,694	\$61,617	\$79,065	\$102,073
Coos County	\$21,070	\$33,816	\$41,804	\$52,888	\$67,940	\$87,911
Coos County % of Oregon	82%	86%	86%	86%	86%	86%
Employment (Coos County)						
# Jobs	31,039	30,873	31,893	32,833	33,874	35,015

Source: Woods & Poole (2014)

POPULATION

In broad terms, the population within an airport’s service area affects the type and scale of aviation facilities and services that can be supported. Although a large number of airport-specific factors can affect activities at an airport, changes in population often reflect other broader economic conditions which may affect airport activity.

As noted earlier, the airport service area for Bandon State Airport extends beyond Bandon and includes other communities and unincorporated areas of Coos County and adjacent Curry and Douglas Counties. Physical geography is a significant factor in Coos County’s population distribution. Beyond the urban area created by Coos Bay and North Bend, the remainder of Coos County’s population is scattered among five other incorporated cities and large unincorporated areas served by the highway system along the coast and inland.

Historic Population

Certified estimates of population for Oregon counties and incorporated cities are developed annually by the Portland State University (PSU) Population Research Center. The annual PSU estimates, coupled with the U.S. Census, conducted every ten years, provide an indication of local area population trends over an extended period.⁴

The July 1, 2013 PSU certified population estimates for Bandon and Coos County were 3,100 and 62,860, respectively. Compared to the 2010 Census, Bandon’s population is up 1.1 percent and Coos County’s population has declined by about 0.3 percent.

⁴ Portland State University Population Research Center, July 1, 2013 estimate; 1990, 2000, 2010 U.S. Census.

Since 1970, Bandon’s population has increased by nearly 70 percent⁵, with an average annual growth rate of 1.2 percent. During the same period, Coos County’s population increased by about 11 percent, or 0.25 percent annually. In recent years, Coos County’s population has fluctuated with periods of net growth and decline, and is currently 1.9 percent below a recent peak (1980 Census). Overall population growth in Coos County during this period has been consistently lower than Oregon’s statewide rate, although Bandon has occasionally outpaced statewide growth.

Bandon’s population has increased at a faster rate than County population in recent years. Bandon (incorporated area) accounted for 4.9 percent of Coos County’s 2013 population, up from 4.5 percent in 2000. In 1970, Bandon accounted for 3.2 percent of Coos County population.

Recent historic population data and average growth rates for Bandon, Coos County, and Oregon are summarized in **Table 3-5**.

TABLE 3-5: HISTORIC POPULATION

YEAR	COOS COUNTY	CITY OF BANDON <i>(incorporated area only)</i>	BANDON SHARE (%) OF COOS COUNTY POPULATION	OREGON
1990	60,273	2,215	3.7%	2,842,337
2000	62,779	2,833	4.5%	3,421,399
2010	63,043	3,066	4.9%	3,831,074
2013	62,860	3,100	4.9%	3,919,020
<u>Average Annual Rates (AAR) of Growth</u>	<u>Coos County</u>	<u>City of Bandon</u>		<u>Oregon</u>
1990-2000	0.41%	2.49%		1.87%
2000-2010	0.04%	0.79%		1.14%
2000-2013	0.01%	2.62%		1.05%
2010-2013	-0.01%	0.37%		0.76%

Source: U.S. Census data; Portland State University certified annual estimates.

POPULATION FORECASTS

Oregon Office of Economic Analysis (OEA)

Long-term population forecasts prepared by the Oregon Office of Economic Analysis (OEA) are periodically generated to support local and statewide planning. The most recent OEA long-term forecasts

⁵ Net increase in population may be attributed to both natural growth/in-migration and expansion of city incorporated area through annexation.

were released in March 2013, which project modest sustained growth for Coos County through 2050. The OEA forecasts project steady growth for Coos County through 2030, then a slight decline (< 1%) through 2050. The OEA forecasts are summarized in **Table 3-6**. Coos County population is projected to increase from 62,890 in 2012 to 64,654 in 2050. The projection reflects a net increase of 1,764 over the 38-year forecast period, with an average annual growth rate of 0.073 percent.

It is reasonable to assume that recent historic trends will continue and significant portion of the forecast population growth will occur in Bandon and the surrounding areas of unincorporated Coos County. Based on this assumption, future population growth within the airport service area is expected to be a positive factor affecting future activity at Bandon State Airport.

TABLE 3-6: COOS COUNTY & OREGON POPULATION FORECASTS

	2010	2013 PSU July 1 Estimate	2015	2020	2025	2030	2035
Coos County							
OEA Forecast ¹ (0.13% AAR 2010-2035)	63,043 ²	62,860	63,299	64,098	64,816	65,210	65,172
Oregon							
OEA Forecast of State Population ¹ (1.07% AAR, 2010-2035)	3,831,074 ²	3,919,020	4,001,600	4,252,100	4,516,200	4,768,000	4,995,200
Coos County % of Oregon Population	1.65%	1.60%	1.58%	1.51%	1.44%	1.37%	1.31%

1. Prepared by Office of Economic Analysis, Department of Administrative Services, State of Oregon (March 28, 2013)

2. 2010 U.S. Census Data

Overview of Recent Local and National Events

Between 2003 and 2014, the number of based aircraft at Bandon State Airport increased from 29 to 37⁶ (+28%), which is slightly ahead of the previous master plan forecast. A review of the 2004 Airport Layout Plan and current conditions on the airport indicate that three additional conventional hangars have been constructed since 2004. Note: a new conventional hangar was constructed in summer 2015.

Airport management reports that 100LL AVGAS sales have averaged 10,000 gallons per year over the last four years, but are trending upward (14,000 gallons in 2013). Jet fuel was available at the airport when the last master plan was completed, but has since been eliminated. The increase AVGAS volume is consistent with the recent increase in based aircraft at the airport.

Nationally, AVGAS consumption levels dropped every year between 2000 and 2013, ending 39 percent below 2000 levels. Contributing factors include economic recession, rising fuel prices, the ever-increasing cost of aircraft operation, use of alternative fuels (auto gas), and a shrinking piston-engine fleet (-6.7% between 2000 and 2013). It appears that Bandon State Airport has been able to counter the national trends to some degree, which may be largely attributed to the desirability of location for residents, visitors and business.

As noted earlier, Bandon Dunes Golf Resort has emerged as a premier golfing destination that is creating significant local and regional economic impacts and is stimulating demand for air travel.

Historical & Current Aviation Activity

For Bandon State Airport, aircraft operational data (takeoffs and landings, touch and go landings, etc.) are limited to estimates. As a non-towered airport, no record of activity is regularly maintained. However, a review of estimates contained in state aviation system plans, previous airport master plans, and FAA Terminal Area Forecast (TAF) data provides a general indication of activity at the airport over time. Based aircraft counts are updated periodically either as part of a master plan or by airport management for other purposes.

HISTORIC DATA - FAA TERMINAL AREA FORECAST (TAF)

The Federal Aviation Administration (FAA) Terminal Area Forecast (TAF) is maintained for airports that are included in the National Plan of Integrated Airport System (NPIAS). The TAF is periodically updated and adjusted as more specific airport activity data are available. When reviewing FAA TAF data, it is important to note that when there is no change from year to year it often indicates a lack of data, rather than no change in activity. Similarly, a large change in data in a single year may follow updated reporting that captures changes that occurred over several years. Small changes in year-to-year activity that extend through the forecast typically reflect assumed growth rates that are not frequently updated.

⁶ July 2014 Airport Management/Aero Club/FBO Count

For these reasons, the TAF should be used as general guide for comparison with other forecasts and periodic activity estimates.

A review of the historic TAF data for Bandon State Airport (1990 through 2012) shows three significant adjustments (+/- 50% or more) in annual aircraft operations totals and based aircraft totals in a single year. It is noted that the 2014 based aircraft count (37) generated for the master plan is only slightly below the TAF based aircraft estimate for 2014 (40). However, the TAF estimate of aircraft operations for 2014 is significantly lower (-60%) than the 2004 Airport Layout Plan forecasts and the 2007 Oregon Aviation Plan forecasts for comparable years. **Table 3-7** summarizes recent historic based aircraft and aircraft operations estimates for the Airport from the TAF.

TABLE 3-7: FAA TAF DATA – BANDON STATE AIRPORT

YEAR	AIRCRAFT OPERATIONS ¹	BASED AIRCRAFT ¹	RATIO: GA OPERATIONS PER BASED AIRCRAFT
2002	15,500	29	535
2003	15,775	29	544
2004	16,048	31	518
2005	16,325	31	527
2006	16,572	31	535
2007	16,805	31	542
2008	17,059	49	348
2009	17,292	49	353
2010	7,100	49	145
2011	7,100	49	145
2012	7,100	40	178

1. FAA Terminal Area Historical Activity based on estimates with periodic updates from various planning updates

CURRENT ESTIMATE OF ACTIVITY

Based Aircraft

An updated (July 2014) count of based aircraft indicates a total of 37 aircraft, including 30 single-engine piston, 2 multi-engine piston, 1 turboprop, and 4 ultralights. The addition of the turbine aircraft to the based aircraft fleet has occurred since the last master plan was completed in 2004. The turboprop (Beechcraft C90) is included in Airplane Design Group II (ADG II), while the remaining fixed wing aircraft are included in Airplane Design Group I (ADG I).

Aircraft Operations

The FAA provides planning guidance for estimating activity at general aviation airports without control towers, including the use of activity ratios to project aircraft operations from the number of based aircraft at the airport. In the absence of actual aircraft operations counts, the ratios of activity are generally adequate for airport planning purposes. The FAA developed “typical” operations ratios for general aviation airports based on their observations at airports throughout the United States. The recommended ratios are 250 operations per based aircraft for small airports with low activity; 350 operations per based aircraft for airports with moderate local and itinerant activity; and 450 operations per based aircraft for high activity airports in urban areas. The ratios are intended to reflect operations from both locally-based and transient aircraft. However, the presence of unique activities such as a large flight school or other commercial operations can increase traffic volumes based on significantly higher aircraft utilization levels (annual flight hours per aircraft, etc.). Conversely, the absence of aviation fuel or a fixed base operator (FBO) can contribute to lower activity levels.

The 2004 Airport Layout Plan Report forecast base year (2003) activity was 15,500 operations and 29 based aircraft, producing an operations-to-based aircraft ratio of 535. The ratio increased in each of the forecast years, ending in 2023 with 575 operations per based aircraft. The ratios appear to be on the high side for a small general aviation airport with limited commercial activities.

Based on current conditions, the airport’s historic utilization levels, recent fuel data, relevant national trends, and the FAA’s current guidance on estimating aircraft activity at non-towered airports, it appears that a ratio of approximately 300 operations per based aircraft would be more consistent with current operations at Bandon State Airport. This level of aircraft utilization would also provide a reasonable basis for developing forecasts of future activity. Perhaps the most significant unique activity generator at Bandon State Airport is transient activity associated with Bandon Dunes Golf Resort. Although currently limited to smaller aircraft, it appears to be a consistently strong and unique source of air traffic.

Applying the ratio of **300 operations to 37 based aircraft** for 2014 results in a total of **11,100 annual operations**. The ratio is intended to capture both local and transient aircraft activity. A detailed distribution of current traffic is provided in the forecast of aircraft operations later in the chapter.

Airport Traffic Counts

Beginning in the 1980s, aircraft operations (takeoffs and landings) counts at non-towered airports were conducted on a semi-regular basis by the Oregon Department of Aviation (ODA) through its “RENS” automated activity counting program. The RENS program methodology relied on four brief sample periods over a 12-month period to account for seasonal variation in activity. Recorders were placed next to runways to capture distinct engine sounds for takeoffs that could be identified by aircraft type. The acoustical events were tallied and the sample data was statistically extrapolated to provide a 12-month estimate of activity. The program was phased out in 2003, but provided three annual operations estimates for Bandon State

between 1995 and 2002. The most recent activity count was conducted in 2002-2003 (October to October) with a total of 8,891 operations. By applying the 2003 based aircraft estimate from the previous master plan, the corresponding activity ratio is 307 operations per based aircraft.

The based aircraft-operations ratios associated with the historic RENS counts are generally consistent with activity ratios currently defined by FAA for estimating activity at small non-towered general aviation airports. It is also reasonable to assume that current activity ratios may increase as Bandon continues to evolve and Bandon Dunes Golf Resort continues matures and becomes even more prominent as a premier destination.

Aviation Activity Forecasting

BASED AIRCRAFT FORECASTS

Three existing aviation forecasts for Bandon State Airport are available to compare with current activity, recent historic trends, and the updated forecasts prepared for the master plan. The existing forecasts have been examined and have not been modified to reflect recent events. Minor adjustments (interpolation, extrapolation) have been made to present each projection with common forecast year intervals. Although some projections may be obsolete relative to current activity (in actual numbers), the long-term growth rates reflected in the existing forecasts are typically within the range found at many general aviation airports and provide a useful basis of comparison. The existing forecasts provide a useful gauge of future growth rates that are generally consistent with national and statewide expectations for defining general aviation activity.

Existing and updated based aircraft forecasts are summarized below and in **Tables 3-8** through **3-11**. Annual aircraft operations forecasts are described later in the chapter.

Existing Forecasts

2004 Airport Layout Plan (2003-2023)

The 2004 Bandon State Airport - Airport Layout Plan Report⁷ forecast projected an increase from 29 to 36 based aircraft between 2003 and 2023, which reflected an average annual growth rate of **1.09 percent**. The forecasts have reached the mid-point of their projected timeline and provide an opportunity to assess the accuracy of the growth assumptions.

The current based aircraft total (37) exceeds the ALP Report forecast for both 2013 (32) and 2023 (36). The actual increase of 8 aircraft over the 11-year period equates to an average annual growth rate of **2.24 percent**, double the ALP Report forecast rate.

⁷ Coffman Associates, W&H Pacific (2004)

It is evident that based aircraft growth at Bandon State Airport outperformed the forecasts in the first half of the twenty-year planning period. The remaining ten years of the forecasts are not consistent with the actual growth trend established at the Airport over the last decade and are not recommended for use in evaluating future airport planning needs.

FAA Terminal Area Forecast (TAF)

The FAA’s 2014 TAF forecast update projects based aircraft at Bandon State Airport to increase from 40 to 52 (+12%) between 2012 and 2040, which represents average annual growth of **0.94 percent**. The 2014 TAF forecast for based aircraft (40) is within 10 percent of the current based aircraft count (37) and appears to provide a valid projection for comparison. On a regional level, the 2013-2040 Terminal Area Forecast projects the number of based aircraft (general aviation) in the Northwest-Mountain Region to increase at an annual average rate of 0.96 percent through 2040, which is comparable to the forecast rate applied to Bandon State Airport.

2007 Oregon Aviation Plan

The 2007 Oregon Aviation Plan (OAP) contains based aircraft forecasts for Oregon’s public use airports for the 2005-2025 timeframe. For Bandon State Airport, the OAP forecasts used the 2005 FAA TAF based aircraft and annual operations estimates as the base for its forecast. Based aircraft were projected to increase from 31 to 40 (+29%) between 2005 and 2025, which represents average annual growth of **1.28 percent**. The 2015 OAP forecast (36) is within 10 percent of the current based aircraft count (37) and appears to provide a valid projection for comparison.

TABLE 3-8: SUMMARY OF EXISTING BASED AIRCRAFT FORECASTS (BANDON STATE AIRPORT)

EXISTING FORECASTS	2010	2015	2020	2025	2030	2035
2004 Airport Layout Plan Report (1.09% AAR 2003-2023)	31 ¹	33 ¹	35 ¹	37 ²	--	--
2007 Oregon Aviation Plan (1.28% AAR 2005-2025)	34	36	38 ¹	40	--	--
FAA Terminal Area Forecast (Issued Feb. 2014) (0.94% AAR 2012-2040)	--	42	48	52	52	52

1. Interpolated. 2. Extrapolated.

Updated Forecasts

Several updated projections of based aircraft at Bandon State Airport have been prepared based on a review of recent socioeconomic data, existing aviation activity forecasts, and current conditions. The updated forecasts are presented in the following section.

The 2004 Airport Layout Plan Report forecast methodology for based aircraft was reviewed and found to be appropriate for use in this update. The previous planning effort developed projections based on two common market share techniques: Bandon State Airport's share of FAA-registered aircraft in Coos County and its share of U.S. Active General Aviation Aircraft. A third population-based projection was developed for this forecast update, utilizing the number of based aircraft per 1,000 Coos County residents. Updated versions of these projections are presented below.

Coos County FAA-Registered Aircraft Market Share

There are currently 132 active aircraft registered by the Federal Aviation Administration (FAA) in Coos County.⁸ Although the address of owner registration does not always indicate the physical location of an aircraft during the year, the measure provides a stable basis from which to project Bandon State Airport's share of the local market. For forecasting purposes, updated projections were developed based on *increasing, constant, and decreasing* market share. The forecasts are presented in **Table 3-9**.

The 37 based aircraft at Bandon State Airport represents 28 percent of the current Coos County FAA-registered aircraft total, up from 20 percent in 1994 and 19 percent in 2003. For forecasting purposes, future Coos County FAA-registered aircraft are projected to increase at the same rate (1.23%) used to forecast Oregon's 2005-2025 statewide general aviation fleet in the 2007 Oregon Aviation Plan.

The *decreasing* market share forecast gradually reduces Bandon State Airport's market share from 28 to 24 percent during the twenty year planning period. The projection results in an increase from 37 to 41 based aircraft at Bandon State Airport by 2034, which represents an average annual growth rate of **0.52 percent**. This projection assumes that Bandon State Airport's future market share will trend back toward its historic levels.

The *constant* market share forecast maintains Bandon State Airport's current market share at 28 percent. The projection results in an increase from 37 to 47 based aircraft by 2034, which represents an average annual growth rate of **1.2 percent**. This projection assumes that Bandon State Airport will be able to maintain the growth in market share realized over the last 20+ years in a competitive environment.

⁸ FAA Registered Aircraft Database (http://registry.faa.gov/aircraftinquiry/StateCounty_State.txt=OR&County.txt=COOS)

The *increasing* market share forecast gradually increases Bandon State Airport’s market share from 28 to 29.5 percent during the twenty year planning period. The projection results in an increase from 37 to 50 based aircraft at Bandon State Airport by 2034, which represents an average annual growth rate of **1.52 percent**. This projection assumes that Bandon State Airport’s future market share will continue to grow in a manner similar to Bandon’s growing proportionate share of county population over the last several decades. The aviation equivalent of this trend requires a strong underlying attraction to the area combined with the facilities and services that are in demand by aviation users.

As noted earlier in the chapter, the 2013 Airport Master Plan completed for Southwest Oregon Regional Airport anticipates nominal growth in based aircraft (+11) and new hangar demand by 2030. This suggests that Bandon State Airport is well positioned to maintain or increase local market share.

TABLE 3-9: BASED AIRCRAFT FORECAST (MARKET SHARE OF FAA REGISTERED AIRCRAFT IN COOS COUNTY)

YEAR	BASED AIRCRAFT BANDON STATE AIRPORT	FAA REGISTERED AIRCRAFT COOS COUNTY	% OF FAA REGISTERED AIRCRAFT AT BANDON STATE AIRPORT
Historic			
1994	29	147	20%
2003	29	156	19%
2014	37	132	28%
Forecast – Decreasing Share (0.52% AAR) ²			
2019	38	140 ¹	27%
2024	39	149 ¹	26%
2029	40	159 ¹	25%
2034	41	169 ¹	24%
Forecast – Constant Share (1.20% AAR) ²			
2019	39	140 ¹	28%
2024	42	149 ¹	28%
2029	45	159 ¹	28%
2034	47	169 ¹	28%
Forecast – Increasing Share (1.52% AAR) ²			
2019	40	140 ¹	28.5%
2024	43	149 ¹	29.0%
2029	46	159 ¹	29.0%
2034	50	169 ¹	29.5%

Source: Based aircraft - airport records, 2004 ALP Report; Registered Aircraft – FAA

1. Coos County registered aircraft projections based on statewide forecast average annual growth rate (1.23%) of general aviation fleet (2007 OAP)

2. AAR: average annual rate of growth (2014-2034)

U.S. Active General Aviation Fleet Market Share

In 2013, Bandon State Airport accounted for approximately 0.018 percent of the U.S. active general aviation fleet, up from 0.016 percent in 1994 and 0.014 percent in 2003. This trend is reflective of both local population growth and the airport's ability to attract new users over time at a rate slightly higher than the national average. Projections were developed based on *increasing, constant, and decreasing* market share. The forecasts are presented in **Table 3-10**.

The FAA Aerospace Forecast 2014-2034 projects the active general aviation fleet to grow at an average annual rate of 0.5 percent between 2013 and 2034. The U.S. fleet is projected to increase from 202,865 in 2013 to 225,700 in 2034. The modest net increase of 22,835 aircraft over 21 years reflects future growth that is significantly tempered by fleet attrition.

The *decreasing* market share forecast gradually reduces Bandon State Airport's market share from 0.018 to 0.014 percent. The projection results in a decrease from 37 to 32 based aircraft at Bandon State Airport by 2034, which represents an average annual decline of **-0.69 percent**. This projection assumes that Bandon State Airport's future market share will regress, which could be caused by a combination of economic factors, competition from other airports within the local airport service area, or the inability to accommodate demand for facilities and services.

The *constant* market share forecast maintains Bandon State Airport's current market share at 0.018 percent. The projection results in an increase from 37 to 41 based aircraft by 2034, which represents an average annual growth rate of **0.49 percent**. This projection assumes that Bandon State Airport's growth in based aircraft will mirror the national average over the next twenty years and that the growth in market share realized over the last 10 to 20 years can be maintained.

The *increasing* market share forecast gradually increases Bandon State Airport's share of the active U.S. fleet from 0.018 to 0.022 percent. The projection results in an increase from 37 to 50 based aircraft by 2034, which represents an average annual growth rate of **1.52 percent**. This projection assumes that Bandon State Airport's growth in based aircraft will exceed the forecast growth for the overall fleet. As with the previous increased market share projection, the underlying strength of the local area and the Airport's ability to attract and accommodate new aircraft are key factors in outperforming broader markets.

TABLE 3-10: BASED AIRCRAFT FORECAST (MARKET SHARE OF US ACTIVE GA AIRCRAFT)

YEAR	BASED AIRCRAFT BANDON STATE AIRPORT	U.S. ACTIVE GENERAL AVIATION AIRCRAFT ¹	% OF U.S. ACTIVE GA AIRCRAFT BASED AT BANDON STATE AIRPORT
Historic			
2003	29	211,370	0.014%
2013	37	202,865	0.018%
Forecast – Decreasing Share (-0.69% AAR) ²			
2019	35	205,140	0.017%
2024	33	209,040	0.016%
2029	32	215,840	0.015%
2034	32	225,700	0.014%
Forecast – Constant Share (0.49% AAR) ²			
2019	37	205,140	0.018%
2024	38	209,040	0.018%
2029	39	215,840	0.018%
2034	41	225,700	0.018%
Forecast – Increasing Share (1.52% AAR) ²			
2019	39	205,140	0.019%
2024	42	209,040	0.020%
2029	45	215,840	0.021%
2034	50	225,700	0.022%

Source: Based aircraft- airport records, 2004 ALP Report; Registered Aircraft – FAA

1. FAA Aerospace Forecasts 2014-2034

2. AAR: annual average rate of growth (2014-2034)

Bandon State Airport: Coos County Population

Available data indicate that the based aircraft fleet at Bandon State Airport has grown at a slightly faster rate than Coos County population over the last 20 years. The Oregon Office of Economic Analysis (OEA) 2010-2050 population forecast for Oregon counties was used to develop projections of Coos County population to support this evaluation. During this period, the ratio of aircraft based at Bandon State Airport to Coos County population increased from approximately 0.46 aircraft per 1,000 residents in 2003, to 0.59 aircraft per 1,000 residents in 2013. Projections were developed based on *increasing, constant, and decreasing* population ratios. The forecasts are presented in **Table 3-11**.

The *decreasing* population ratio forecast gradually decreases Bandon State Airport's based aircraft to population ratio from 0.59 to 0.55 per 1,000 Coos County residents over the next twenty years. The projection results in a decrease from 37 to 36 based aircraft by 2034, which represents an average annual decline of **-0.14 percent**. It is noted that the declining population ratio change is slight, but when applied to modest county population projections, results in a static, then slightly declining activity during the twenty-year planning period.

The *constant* population ratio forecast maintains Bandon State Airport's based aircraft to population ratio of 0.59 aircraft per 1,000 Coos County residents through the twenty year planning period. The projection results in an increase from 37 to 39 based aircraft by 2034, which represents an average annual growth rate of **0.26 percent**. This projection assumes that Bandon State Airport's based aircraft fleet will grow at the same rate as Coos County population over the next twenty years.

The *increasing* population ratio forecast gradually increases Bandon State Airport's based aircraft to population ratio from 0.59 to 0.65 per 1,000 Coos County residents over the next twenty years. The projection results in an increase from 37 to 41 based aircraft by 2034, which represents an average annual growth rate of **0.52 percent**. This projection assumes that Bandon State Airport's based aircraft fleet will continue to grow at a slightly faster rate than Coos County population over the next twenty years.

TABLE 3-11: BASED AIRCRAFT FORECAST (BASED AIRCRAFT PER 1,000 COOS COUNTY RESIDENTS)

YEAR	BASED AIRCRAFT BANDON STATE AIRPORT	COOS COUNTY POPULATION ¹	BASED AIRCRAFT PER 1,000 RESIDENTS
Historic			
1994	29	61,260	0.47
2003	29	63,260	0.46
2013	37	62,860	0.59
Forecast – Decreasing Share (-0.14% AAR) ²			
2019	37	63,937	0.58
2024	37	64,672	0.57
2029	37	65,131	0.56
2034	36	65,180	0.55
Forecast – Constant Share (0.26% AAR) ²			
2019	38	63,937	0.59
2024	38	64,672	0.59
2029	38	65,131	0.59
2034	39	65,180	0.59
Forecast – Increasing Share (0.52% AAR) ²			
2019	38	63,937	0.60
2024	39	64,672	0.61
2029	40	65,131	0.62
2034	41	65,180	0.63

Source: Based aircraft - airport records, 2004 ALP Report; Registered Aircraft – FAA

1. Oregon Office of Economic Analysis 2010-2050 forecasts

2. AAR: annual average rate of growth (2014-2034)

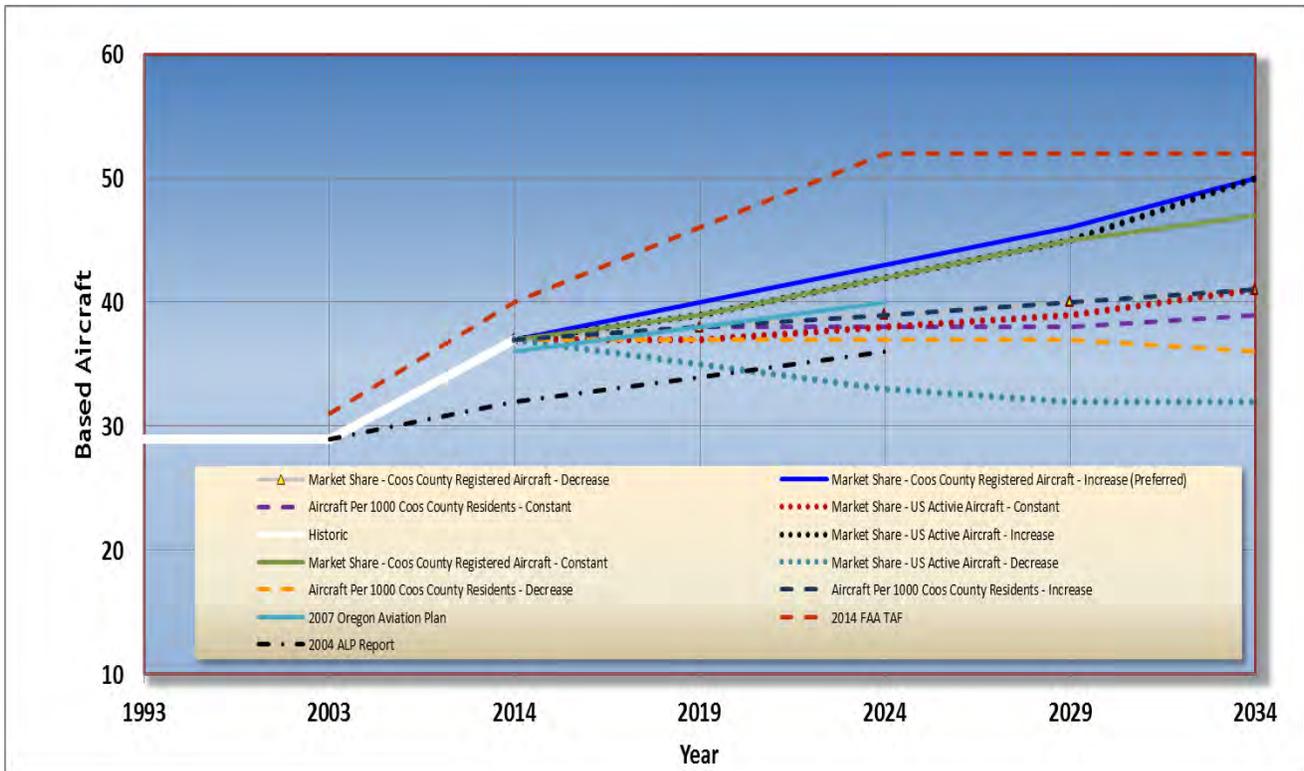
Summary (Based Aircraft)

This *Coos County FAA Registered Aircraft - Increasing Market Share* projection is recommended as the preferred based aircraft forecast for use in the airport master plan. This projection reflects the historic trend established at Bandon State Airport over the last twenty years, the expectation of continued residential growth in Bandon and the surrounding area, and expectations at other airports in the airport service area. **Table 3-12** summarizes the based aircraft forecasts. **Figure 3-3** depicts the based aircraft forecasts.

TABLE 3-12: SUMMARY OF BASED AIRCRAFT FORECASTS (BANDON STATE AIRPORT)

	2014 (ACTUAL)	2019	2024	2029	2034
Market Share of Registered Aircraft (Coos County)					
➤ Decreasing Market Share	37	38	39	40	41
➤ Constant Market Share	37	39	42	45	47
➤ Increasing Market Share (Preferred Forecast)	37	40	43	46	50
Market Share of U.S. Active GA Aircraft					
➤ Decreasing Market Share	37	35	33	32	32
➤ Constant Market Share	37	37	38	39	41
➤ Increasing Market Share	37	39	42	45	50
Aircraft Per 1,000 Residents (Coos County)					
➤ Decreasing Market Share	37	37	37	37	36
➤ Constant Market Share	37	38	38	38	39
➤ Increasing Market Share	37	38	39	40	41

FIGURE 3-3: BANDON STATE AIRPORT - BASED AIRCRAFT FORECASTS



BASED AIRCRAFT FLEET MIX

The airport’s current mix of based aircraft is projected to become more diverse during the current planning period reflecting growth in turbine aircraft (turboprop, very light jet/business jet), helicopters and light sport aircraft. The projected changes in the based aircraft fleet mix at Bandon State Airport are generally consistent with broader trends identified by FAA regarding the composition of the general aviation fleet as a whole and reflect the airport’s unique ability to attract a variety of aircraft types for business and personal transportation. **Figures 3-4A and 3-4B** depict the current (2014) and long-term (2034) distribution of based aircraft by type. The forecast based aircraft fleet mix is summarized in **Table 3-13**.

FIGURE 3-4A: BANDON STATE AIRPORT - BASED AIRCRAFT FLEET MIX (JULY 2014)

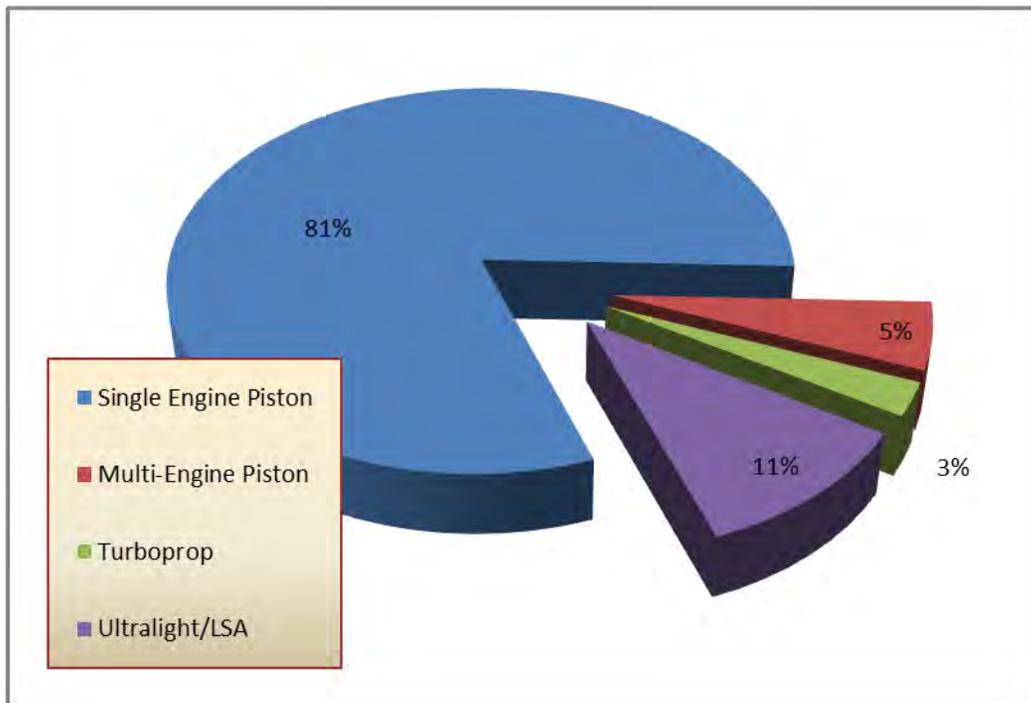


FIGURE 3-4B: BANDON STATE AIRPORT – FORECAST BASED AIRCRAFT FLEET MIX (2034)

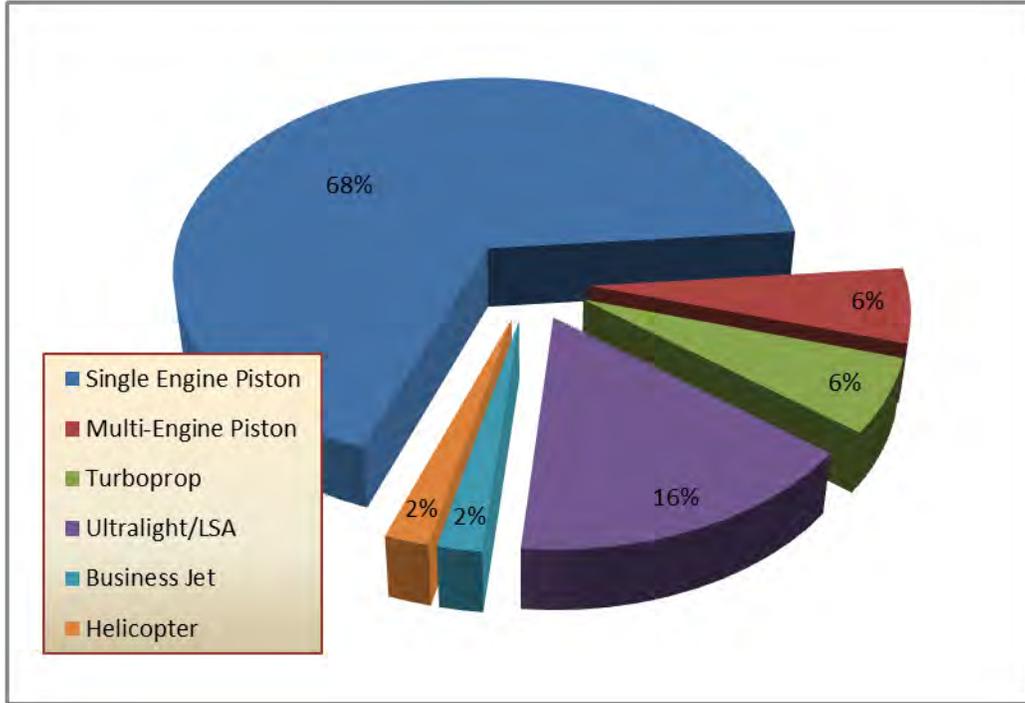


TABLE 3-13: GENERAL AVIATION FORECAST BASED AIRCRAFT FLEET MIX

ACTIVITY	2014	2019	2024	2029	2034
Single Engine Piston	30 (81%)	31 (78%)	32 (74%)	33 (72%)	34 (68%)
Multi-Engine Piston	2 (5%)	2 (5%)	2 (5%)	2 (4%)	3 (6%)
Turboprop	1 (3%)	2 (5%)	2 (5%)	2 (4%)	3 (6%)
Business Jet/VLJ	0 (0%)	0 (0%)	0 (0%)	1 (2%)	1 (2%)
Light Sport Aircraft/Ultralights	4 (11%)	5 (13%)	6 (14%)	7 (15%)	8 (16%)
Helicopter	0 (0%)	0 (0%)	1 (2%)	1 (2%)	1 (2%)
Total Based Aircraft (100%)	37	40	43	46	50

Note: Percentages may not sum due to independent rounding

AIRCRAFT OPERATIONS FORECASTS

General aviation operations consist of aircraft takeoffs and landings conducted by general aviation aircraft and are classified as local or itinerant. General aviation airports may accommodate limited commercial activity (cargo/express, air taxi) generated by general aviation aircraft and military activity based on their airfield capabilities.

Local operations are conducted in the vicinity of an airport and include flights that begin and end the airport. These include local area flight training, touch and go landings, flightseeing, and other flights that do not involve a landing at another airport. Itinerant operations include flights between airports, including cross country flights. Itinerant operations reflect specific travel between multiple points, often associated with business and personal travel.

As noted earlier, three existing aircraft operations forecasts have been reviewed and are summarized below. Updated aircraft operations projections have been developed and are also presented.

Existing Forecasts

2004 Airport Layout Plan (2003-2023)

The 2004 Bandon State Airport - Airport Layout Plan Report projected annual aircraft operations at Bandon State Airport to increase from 15,500 to 20,700 between 2003 and 2023, which reflected an average annual growth rate of **1.46 percent**.

The current estimate of 11,100 annual operations noted earlier is 37.5 percent below the ALP forecast (16,900) for 2013, which suggests that the projection does not provide a reasonable projection for comparison. It is also noted that the base year (2003: 15,500 operations) in the ALP forecasts does not correlate to current traffic estimates.

FAA Terminal Area Forecast (TAF)

The FAA's 2014 TAF forecast update projects aircraft operations at Bandon State Airport to increase from 7,100 to 9,797 (+38%) between 2012 and 2040, which represents average annual growth of **1.16 percent**. The TAF operations forecast for 2014 (7,280) is approximately 34 percent below the current master plan estimate of 11,100 operations noted earlier in the chapter. The TAF operations forecasts reflect slowly increasing ratios of operations (178 to 188) to based aircraft through 2040. Although the projected activity ratios appear low, the average annual growth rates are reasonable and provide valid comparison with other forecasts.

On a regional level, the 2013-2040 Terminal Area Forecast projects itinerant operations (commercial, GA, military) in the Northwest-Mountain Region to increase at an annual average rate of **1.1 percent** through 2040.

2007 Oregon Aviation Plan

The 2007 Oregon Aviation Plan (OAP) forecasts annual aircraft operations at Bandon State Airport to increase from 16,235 to 20,950 between 2005 and 2025, which represents average annual growth of **1.26 percent**. The 2015 OAP forecast (18,835) is 7,735 (+70%) higher than the current aircraft operations estimate (11,100) and does not appear to provide a valid projection for comparison.

TABLE 3-14: EXISTING AIRCRAFT OPERATIONS FORECASTS (BANDON STATE AIRPORT)

EXISTING FORECASTS	2010	2015	2020	2025	2030	2035
2004 Airport Layout Plan Report (1.09% AAR 2003-2023)	17,239	18,313	19,770 ¹	21,344 ²	--	--
2007 Oregon Aviation Plan (1.28% AAR 2005-2025)	17,779	18,835	19,865 ¹	20,950	--	--
FAA Terminal Area Forecast (Issued Feb. 2014) (1.16% AAR 2012-2040)	7,100	7,372	7,828	8,288	8,762	9,264

1. Interpolated. 2. Extrapolated.

Updated Forecasts

Updated aircraft operations projections have been developed for comparison with existing forecasts in order to identify a selected forecast for the master plan. The updated operations forecasts utilize the 2014 estimate (11,100) as the base for new projections. The current estimate reflects a ratio of 300 operations per based aircraft ($37 \times 300 = 11,100$) based on the strength of the local area to attract and generate activity.

Consistent with the methodology used in the 2004 ALP Report forecasts, the updated aircraft operations forecasts utilize ratios of operations to based aircraft to reflect activity generated by locally-based and transient aircraft. The projections were developed using an FAA-recommended methodology for estimating airport operations at non-towered general aviation airports. The model was developed by FAA by using regression modeling data from all small towered and non-towered general aviation airports and incorporated several independent variables including airport characteristics, population, and geographic location.

The preferred forecast in the 2004 Airport Layout Plan Report yielded an increasing ratio of 535 to 575 general aviation operations per based aircraft. It is noted that these projections were prepared before the severe economic recession of the late 2000s. The updated operations forecasts are lower than the 2004 ALP Report forecasts, due in large part to the impact of economic conditions and the current long-term growth expectations nationally, which have been tempered significantly compared to “pre-recession” forecasts.

Based on more recent activity trends, the “typical” activity range defined by FAA for general aviation airports ranges from 250 to 450 operations per based aircraft. This range appears to provide a reasonable indication of activity that may be expected at Bandon State Airport during the current twenty year period.

Constant and Increasing Operations Ratio

Based on the conditions for the local airport service described earlier in the chapter, two forecast scenarios were developed for aircraft operations. The scenarios reflect slightly different operational profiles that are facility-dependent. The updated aircraft operations forecasts are summarized in **Table 3-15** and depicted in **Figure 3-5**.

The first forecast (**constant ratio projection**) maintains the 300 operations per based aircraft ratio through the twenty-year planning period that was used to estimate current activity. The projection assumes that aircraft utilization will remain at current levels and growth in aircraft operations will be driven primarily by a net increase in based aircraft. This forecast can be sustained by the current airfield capabilities (e.g., runway length, etc.) and the current operational fleet mix would not change significantly (single- and multi-engine piston and turboprop; small/medium business jets; helicopters and sport aircraft). The future design aircraft will reflect the functional capabilities of the existing runway. The aircraft utilization level is tempered to reflect various economic factors and existing facility limitations, but is also higher than the ratios reflected in the FAA TAF, based on a local economy that has a strong visitor component, which translates into to strong transient flight activity.

The second forecast (**increasing ratio projection**) assumes a gradual increase from 300 to 400 operations per based aircraft through the planning period. The increase in aircraft utilization would be driven by capturing a larger share of the existing and future general aviation activity that is currently accommodated at Southwest Oregon Regional Airport (OTH), which that would be accomplished through several specific facility improvements (runway extension, instrument approach capability, on-site weather, etc.). The current operational fleet mix would evolve to include more transient turboprops and business jets. The future design aircraft will reflect the functional capabilities of the future runway. However, based on the footprint of the airport and its surroundings, it is assumed that facility improvements would be relatively minor and OTH would continue to accommodate large aircraft requiring more runway length or specific services.

The constant ratio projection results in general aviation aircraft operations increasing from 11,100 to 15,000 by 2034, which represents an average annual growth rate of **1.52 percent**. The increasing ratio projection results in general aviation aircraft operations increasing from 11,100 to 20,000 by 2034, which represents an average annual growth rate of **2.99 percent**.

Summary (Aircraft Operations)

The preliminary aircraft operations forecasts are presented for review. The Oregon Department of Aviation will select a preferred forecast based on its assessment of the development potential of the Airport. It is evident that the economic base that exists in the Bandon area, including the continued success of the Bandon Dunes Golf Resort, provides a solid user base that is capable of generating aviation activity throughout the current planning period and beyond. The extent to which Bandon State Airport accommodates future general aviation air traffic will depend on the capabilities of airport facilities that are provided.

TABLE 3-15: AIRCRAFT OPERATIONS FORECASTS

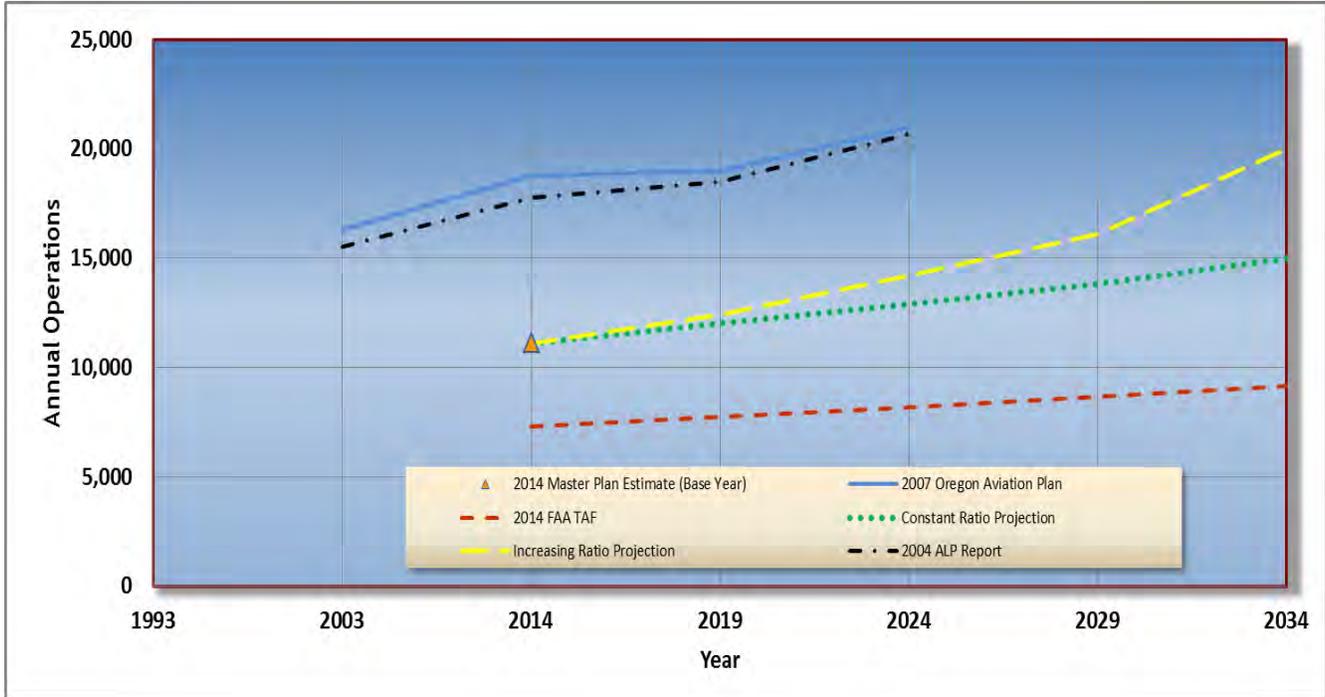
YEAR	BASED AIRCRAFT	LOCAL OPERATIONS	ITINERANT OPERATIONS	TOTAL OPERATIONS	OPERATIONS PER BASED AIRCRAFT
FAA TAF					
2014	40	3,690	3,590	7,280	182
2019	46	3,921	3,815	7,736	168
2024	52	4,156	4,040	8,196	158
2029	52	4,396	4,269	8,665	167
2034	52	4,651	4,510	9,797	188
Constant Ratio Projection (1.52% AAR) ²					
2014	37	5,660	5,440	11,100	300
2019	40	6,120	5,880	12,000	300
2024	43	6,580	6,320	12,900	300
2029	46	7,040	6,760	13,800	300
2034	50	7,650	7,350	15,000	300
Increasing Ratio Projection (2.99% AAR) ²					
2014	37	5,550	5,550	11,100	300
2019	40	5,950	6,450	12,400	310
2024	43	6,390	7,800	14,190	330
2029	46	7,250	8,850	16,100	350
2034	50	8,000	12,000	20,000	400

Source: Based aircraft - airport records, 2004 ALP Report; Registered Aircraft – FAA

1. FAA TAF 2014 Update

2. AAR: annual average rate of growth (2014-2034)

FIGURE 3-5: BANDON STATE AIRPORT GENERAL AVIATION OPERATIONS FORECAST



Local and Itinerant Operations

The FAA TAF and the 2004 ALP Report forecasts reflect a 51 percent local and 49 percent itinerant traffic distribution for forecast operations. For forecasting purposes, the split between local and itinerant operations will be driven by the selected forecast scenario. The existing split is maintained in the constant ratio forecast. However, the split would be expected to gradually reverse to 60% itinerant/40 percent local in the increasing ratio forecasts as increased transient aircraft activity is accommodated. Local and itinerant data for each forecast year are summarized in **Table 3-15**.

AIRCRAFT OPERATIONS FLEET MIX

The aircraft operations fleet mix is expected to closely follow the selected forecast scenario, with varying levels of turbine aircraft operations that will complement the airport’s based aircraft fleet. Currently, single and multi-engine piston aircraft account for approximately 82 percent of airport operations followed by helicopter operations (primarily flight training) (15 percent) and fixed wing turbine aircraft (turboprop and business jet) (2+ percent). Although single engine piston aircraft will continue to generate the majority of aircraft operations at Bandon State Airport through the planning period, their portion of overall traffic is expected to gradually decline as other aircraft types become more common. The general aviation forecast

aircraft operations fleet mix is summarized in **Table 3-16**. Air taxi and military operations forecasts are summarized in Table 3-18.

TABLE 3-16: GENERAL AVIATION FORECAST AIRCRAFT OPERATIONS FLEET MIX

CONSTANT RATIO FORECAST SCENARIO										
AIRCRAFT TYPE	2014	%	2019	%	2024	%	2029	%	2034	%
Single Engine Piston	10,100	91	10,800	90	11,480	89	12,140	88	13,200	88
Multi Engine Piston	400	4	480	4	520	4	410	3	450	3
Turboprop	300	3	360	3	510	4	830	6	900	6
Jet	40	<1	120	1	130	1	140	1	150	1
Helicopter	260	2	240	2	260	2	280	2	300	2
Total Operations (100%)	11,100	100	12,000	100	12,900	100	13,800	100	15,000	100
INCREASING RATIO FORECAST SCENARIO										
AIRCRAFT TYPE	2014	%	2019	%	2024	%	2029	%	2034	%
Single Engine Piston	10,100	91	11,040	89	12,210	86	13,810	86	16,750	84
Multi Engine Piston	400	4	500	4	570	4	480	3	600	3
Turboprop	300	3	500	4	850	6	1,130	7	1,600	8
Jet	40	<1	120	1	280	2	360	2	650	3
Helicopter	260	2	240	2	280	2	320	2	400	2
Total Operations (100%)	11,100	100	12,400	100	14,190	100	16,100	100	20,000	100

Note: Percentages may not sum due to independent rounding

Design Aircraft

As noted earlier, the selection of design standards for airfield facilities is based upon the characteristics of the aircraft that are expected to use the airport. The **design aircraft** is defined as the most demanding aircraft type operating at the airport with a minimum of 500 annual itinerant operations, as described by the Federal Aviation Administration (FAA):

“Substantial Use Threshold. Federally funded projects require that critical design airplanes have at least 500 or more annual itinerant operations at the airport (landings and takeoffs are considered as separate operations) for an individual airplane or a family grouping of airplanes. Under unusual circumstances, adjustments may be made to the 500 total annual itinerant operations threshold after considering the circumstances of a particular airport. Two examples are airports with demonstrated seasonal traffic variations, or airports situated in isolated or remote areas that have special needs.”

The FAA groups aircraft into five categories (A-E) based upon their approach speeds. Aircraft Approach Categories A and B include small propeller aircraft, many small or medium business jet aircraft, and some larger aircraft with approach speeds of less than 121 knots (nautical miles per hour). Categories C, D, and E consist of the remaining business jets as well as larger jet and propeller aircraft generally associated with commercial and military use with approach speeds of 121 knots or more. The FAA also establishes six airplane design groups (I-VI), based on the wingspan and tail height of the aircraft. The categories range from Airplane Design Group (ADG) I, for aircraft with wingspans of less than 49 feet, to ADG VI for the largest commercial and military aircraft.

The combination of airplane design group and aircraft approach speed for the design aircraft creates the Airport Reference Code (ARC), which is used to define applicable airfield design standards. Aircraft with a maximum gross takeoff weight greater than 12,500 pounds are classified as “large aircraft” by the FAA; aircraft 12,500 pounds and less are classified as “small aircraft.”

A list of typical general aviation and business aviation aircraft and their respective design categories is presented in **Table 3-17**. **Figure 3-6** illustrates representative aircraft in various design groups.

TABLE 3-17: GENERAL AVIATION AIRCRAFT & DESIGN CATEGORIES

AIRCRAFT	AIRCRAFT APPROACH CATEGORY	AIRPLANE DESIGN GROUP	MAXIMUM GROSS TAKEOFF WEIGHT (LBS)
Cessna 182 (Skylane)	A	I	3,100
Cirrus Design SR22	A	I	3,400
Cessna Corvallis TT	A	I	3,600
Cessna 206 (Stationair)	A	I	3,614
Beechcraft Bonanza A36	A	I	3,650
Socata/Aerospatiale TBM 700	A	I	6,579
Beechcraft Baron 58	B	I	5,500
Cessna 340	B	I	5,990
Cessna Citation Mustang	B	I	8,645
Embraer Phenom 100	B	I	10,472
Cessna Citation CJ1+	B	I	10,700
Beech King Air C90	B	I	11,800
Beechcraft 400A/Premier I	B	I	16,100
Piper Malibu (PA-46)	A	II	4,340
Cessna Caravan 675	A	II	8,000
Pilatus PC-12	A	II	10,450
Cessna Citation CJ2+	B	II	12,500
Cessna Citation II	B	II	13,300
Beech King Air 350	B	II	15,000
Cessna Citation Bravo	B	II	15,000
Cessna Citation CJ4	B	II	16,950
Embraer Phenom 300	B	II	17,968
Cessna Citation XLS+	B	II	20,200
Dassault Falcon 20	B	II	28,660
Dassault Falcon 900	B	II	45,503
Bombardier Learjet 55	C	I	21,500
Gulfstream 200	C	II	34,450
Cessna Citation X	C	II	36,100
Bombardier Challenger 300	C	II	37,500
Gulfstream III	C	II	69,700
Learjet 35A/36A	D	I	18,300
Gulfstream G450	D	II	73,900
Bombardier Global Express 5000	C	III	92,750

Source: AC 150/5300-13, as amended; aircraft manufacturer data.



A-I

12,500 lbs. or less (small)

- Beech Baron 55
- Beech Bonanza
- Cessna 182**
- Piper Archer
- Piper Seneca



B-I

12,500 lbs. or less (small)

- Beech Baron 58**
- Beech King Air 100
- Cessna 402
- Cessna 421
- Piper Navajo
- Piper Cheyenne
- Cessna Citation I



A-II, B-II

12,500 lbs. or less (small)

- Super King Air 200
- Pilatus PC-12**
- DHC Twin Otter
- Cessna Caravan
- King Air C90



B-II

Greater than 12,500 lbs.

- Super King Air 300, 350
- Beech 1900
- Cessna Citation Excel**
- Falcon 20, 50
- Falcon 200, 900
- Citation II, Bravo XLS+
- Citation CJ3



A-III, B-III

Greater than 12,500 lbs.

- DHC Dash 7
- DHC Dash 8
- Q-300, Q-400**
- DC-3
- Convair 580
- Fairchild F-27
- ATR 72
- ATP



C-I, D-I

- Lear 25, 35, 55, 60**
- Israeli Westwind
- HS 125-700



C-II, D-II

- Gulfstream II, III, IV
- Canadair 600**
- Canadair Regional Jet
- Lockheed JetStar
- Citation X
- Citation Sovereign
- Hawker 800 XP



C-III, D-III

- Boeing Business Jet
- Gulfstream 650**
- B 737-300 Series
- MD-80, DC-9
- Fokker 70, 100
- A319, A320
- Gulfstream V
- Global Express



C-IV, D-IV

- B-757**
- B-767
- DC - 8-70
- DC - 10
- MD - 11
- L 1011



D-V

- B - 747 Series**
- B - 777

Current and Future Design Aircraft

The 2004 Airport Layout Plan identifies a Beechcraft King Air B100 as the existing and future critical aircraft for the Airport. This aircraft is representative of a smaller multi-engine turboprop included in Aircraft Approach Category B and Airplane Design Group I (ADG) I. The combination of approach speed and airplane design group results in Airport Reference Code (ARC) B-I. The King Air B100 has a maximum takeoff weight of 11,800 pounds and is classified as a “small” airplane.

Bandon State Airport currently accommodates a variety of ADG I and II aircraft including two locally-based multi-engine piston aircraft and one multi-engine turboprop (King Air C90 – ARC B-II). The Airport also accommodates transient single- and multi-engine aircraft, including turboprops and business jets that are capable of operating on the 3,600-foot runway, in some cases with limited passenger or fuel loads. The most common single-engine turboprops operating at the Airport include the Pilatus PC12 and Cessna Caravan (ARC A-II) and the Socata TBM700/850 and Piper Meridian (ARC A-I). The single engine turboprops are included in Aircraft Approach Category A (ARC A-II).

As with the operational fleet mix, the future design aircraft for Bandon State Airport will be determined by the preferred operations forecast and the corresponding runway capabilities. As noted earlier, it appears that the general aviation activity currently accommodated in the airport service area includes a substantial level of business class turboprop and business jet traffic. It is also evident that a portion of this activity is associated to Bandon as a destination, whether it is Bandon Dunes Golf Resort or other business, tourism or personal activity. Although any future runway extension will require sufficient documentation of flight activity and justification to meet FAA criteria, the absence of additional runway will dictate what aircraft can actually be accommodated.

Based on these factors, the existing and future design aircraft is defined for each forecast scenario:

Constant Ratio Forecast. Existing ARC B-I (small multi-engine turboprop), with a future ARC A-II (single engine turboprop). These aircraft are classified as a “small” aircraft based on their maximum operating weight (12,500 pounds or less).

Increasing Ratio Forecast. Existing ARC B-I (small multi-engine turboprop), with a future ARC B-II (medium business jet). These aircraft are classified as a “large” aircraft based on their maximum operating weights (more than 12,500 pounds).

Both scenarios would result in a change from ADG I to ADG II design standards and the distinction between Approach Category A and B is not significant within each ADG. The specific facility requirements will be discussed in Chapter 4.

Air Taxi and Military Operations

Air taxi activity includes operations regulated by the FAA under FAR Part 135, including on-demand passenger service (charter and fractional), small parcel transport (cargo), and air ambulance activity. The FAA surveys general aviation and air taxi activity on an annual basis. The information obtained from the survey enables the FAA to monitor the general aviation fleet so that it can:

- Track trends within the industry;
- Anticipate demand for national airspace facilities and services;
- Evaluate the impact of safety initiatives and regulatory changes;
- Improve accuracy of measures of safety in general aviation.

The data collected are also used by other government agencies, the general aviation industry, trade associations, and private businesses to pinpoint safety problems and to form the basis for critical research and analysis of general aviation issues. This data is consolidated in the annual FAA Aerospace Forecasts. The FAA forecasts air taxi operations to remain essentially flat (annual growth rate of -0.1 percent) between 2013 and 2034.

Air taxi activity at Bandon State Airport currently includes occasional charter and fractional on-demand passenger service, and occasional air ambulance flights. For 2014, the FAA TAF projects 514 air taxi operations, which is approximately 7 percent of total (TAF) general aviation (GA) operations and 5 percent of the current operations estimate (11,100). The current level of air taxi activity provides a reasonable baseline for developing future projections during the planning period. For planning purposes, air taxi operations at Bandon State Airport are projected to account for approximately 5 percent of general aviation operations through the current planning period.

Military operations at Bandon State Airport are relatively limited to Coast Guard helicopters and National Guard helicopters and smaller fixed wing aircraft. This activity is typically in support of search and rescue or emergency response operations.

Operational Peaks

It is estimated that peak month activity at Bandon State Airport occurs during the summer (typically July or August) and accounts for approximately 10 percent of annual aircraft operations. This level of peaking is consistent with the mix of airport traffic and is expected to remain relatively unchanged during the planning period. Peak day operations are defined by the average day in the peak month (design day) and the busy day in the typical week during peak month (busy day); the peak hour within the design day represents the design hour. The design day is calculated by dividing peak month operations by 30. The busy day is estimated to be 25 percent higher than the average day in the peak month (design day x 1.25). The

design hour operations are estimated to equal 15 percent of design day operations. Operational peaks for each of the forecast scenarios are summarized in **Table 3-18**.

TABLE 3-18: PEAK GENERAL AVIATION OPERATIONS FORECAST

ACTIVITY	2014	2019	2024	2029	2034
Constant Ratio Forecast					
Annual Operations	11,100	12,000	12,900	13,800	15,000
Peak Month Operations (10%)	1,110	1,200	1,290	1,380	1,500
Design Day (average day in peak month)	37	40	43	46	50
Busy Day	46	50	54	58	63
Design Hour Operations (assumed 15% of design day)	6	6	7	7	8
Increase Ratio Forecast					
Annual Operations	11,100	12,400	14,190	16,100	20,000
Peak Month Operations (10%)	1,110	1,240	1,419	1,610	2,000
Design Day (average day in peak month)	37	41	47	54	67
Busy Day	46	52	59	67	83
Design Hour Operations (assumed 15% of design day)	6	6	7	8	10

Instrument Flight Activity

Bandon State Airport is not currently equipped to accommodate instrument flight activity. The recent OTH master plan indicated that instrument operations accounted for approximately 10 percent of all airfield operations. This level of instrument weather conditions appears to be typical for Oregon coastal areas and would be a reasonable planning standard for Bandon State Airport.

Forecast Summary

The summary of based aircraft and annual aircraft operations forecasts is provided in **Tables 3-19 and 3-19**. As noted earlier, a based aircraft forecast and two scenarios for aircraft operations forecasts were developed for consideration. Based on the review of the preliminary forecasts, ODA selected the “increase ratio forecast” as the preferred aircraft operations forecast. This forecast was approved by FAA following its review.

As with any long term facility demand forecast, it is recommended that long term development reserves be protected to accommodate demand that may exceed current projections. For planning purposes, a reserve capable of accommodating a doubling of the 20-year preferred forecast demand should be adequate to

accommodate unforeseen facility needs during the current planning period. However, should demand significantly deviate from the airport’s recent historical trend, updated forecasts should be prepared to ensure that adequate facility planning is maintained.

TABLE 3-19: FORECAST SUMMARY

ACTIVITY	2014	2019	2024	2029	2034
Annual Operations					
Constant Ratio Forecast					
Itinerant					
General Aviation	4,840	5,180	5,570	5,970	6,500
Air Taxi	500	600	650	690	750
Military	100	100	100	100	100
Total Itinerant	5,440	5,880	6,320	6,760	7,350
Local (all General Aviation)	5,660	6,120	6,580	7,040	7,650
Total Operations	11,100	12,000	12,900	13,800	15,000
Increase Ratio Forecast (Preferred Forecast)					
Itinerant					
General Aviation	4,840	5,730	6,990	7,950	10,900
Air Taxi	500	620	710	800	1,000
Military	100	100	100	100	100
Total Itinerant	5,440	6,450	7,800	8,850	12,000
Local (all General Aviation)	5,660	5,950	6,390	7,250	8,000
Total Operations	11,100	12,400	14,190	16,100	20,000
Based Aircraft					
Single Engine Piston	30 (81%)	31 (78%)	32 (74%)	33 (72%)	34 (68%)
Multi-Engine Piston	2 (5%)	2 (5%)	2 (5%)	2 (4%)	3 (6%)
Turboprop	1 (3%)	2 (5%)	2 (5%)	2 (4%)	3 (6%)
Business Jet/VLJ	0 (0%)	0 (0%)	0 (0%)	1 (2%)	1 (2%)
Light Sport Aircraft/Ultralights	4 (11%)	5 (13%)	6 (14%)	7 (15%)	8 (16%)
Helicopter	0 (0%)	0 (0%)	1 (2%)	1 (2%)	1 (2%)
Total Based Aircraft	37	40	43	46	50
Operations per Based Aircraft (Preferred Forecast)	300	310	330	350	400

TABLE 3-20: FORECAST SUMMARY (BY ARC)

ACTIVITY	2014	2019	2024	2029	2034
Annual Operations (Turbine Aircraft)					
Increase Ratio Forecast (Preferred Forecast)					
Airport Reference Code (A&B)					
A-I Turboprop	40	100	130	200	240
B-I Turboprop	60	100	200	240	300
B-I Business Jet	20	60	120	100	120
A-II Turboprop	80	160	220	340	520
B-II Business Jet	20	60	160	360	490
B-II Turboprop	120	140	300	350	540
C/D I & II Business Jet	0	0	0	20	40
Turbine ADG I Operations	120	260	450	540	660
Turbine ADG II Operations	220	360	680	730	1,070
Total Turbine Operations	340	620	1,130	1,570	2,250

Chapter 4 – Airport Facility Requirements



Chapter 4 – Airport Facility Requirements



Introduction

The evaluation of airport facility requirements uses the results of the inventory and forecasts contained in Chapters Two and Three, as well as established planning criteria, to determine the future facility needs for Bandon State Airport through the current twenty year planning period. Airside facilities include runways, taxiways, navigational aids and lighting systems. Landside facilities include hangars, fixed base operator (FBO) facilities, aircraft parking apron, aircraft fueling, surface access and automobile parking, utilities, and other related items. All airfield items are evaluated based on established standards from the Federal Aviation Administration (FAA).

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

CHANGES IN AIRPORT DESIGN STANDARDS

As noted in the aviation activity forecasts, a change in design aircraft (and the corresponding airport design standards) is anticipated at Bandon State Airport during the current twenty year planning period. The airport has historically accommodated predominantly single-engine and multi-engine aircraft included in Airplane Design Group I (ADG I) (wingspans up to 49 feet) with a limited amount of Airplane Design

Group II (wingspans more than 49 feet but less than 79 feet) activity generated by turboprops and business jets capable of operating on the current 3,601-foot runway.

Based on a combination of local market conditions and current general aviation aircraft manufacturing trends, the forecasts project a gradual increase in Airplane Design Group II (ADG II) activity during the current planning period that will reach the FAA threshold of 500 annual operations (takeoffs and landings) required to define the design aircraft and the corresponding Airport Reference Code (ARC). The ARC represents a combination of Aircraft Approach Category (approach speed) and Airplane Design Group (wingspan, tail height). Additional information about the defining characteristics of ARCs is provided later in the chapter.

The aviation activity forecasts provide “constrained” and “unconstrained” projections that reflect two scenarios that are related to airport’s ability to accommodate future ADG II aeronautical demand. The selection of the future design aircraft (*within* ADG II) is scenario-dependent due to the different runway length requirements associated with different types of aircraft. Although both forecast scenarios result in an increase in ADG II activity that will justify a future change in design standards, the scenarios yield future design aircraft from different approach speed categories (Aircraft Approach Category A and Category B) that also affect aircraft characteristics (weight, runway length requirements, etc.):

Baseline Facility Forecast. ARC A-II (single-engine turboprop) with a maximum operating weight of 12,500 pounds or less. Under most conditions, these aircraft are capable of operating on the current 3,601-foot runway without operational constraints.

Enhanced Facility Forecast. ARC B-II (medium business jet) with a maximum operating weight above 12,500 pounds. Under most conditions, these aircraft require an increase in the current 3,601-foot runway length to eliminate operational constraints (reduced takeoff weight; reduced fuel or passenger payload).

Based on its review of the draft forecasts, the Oregon Department of Aviation, owner and operator of Bandon State Airport, has selected the second “enhanced” facility forecast scenario which is unconstrained and reflects the assumption that an increase in runway length needed to accommodate a segment of this activity is feasible for the site.

It is important to note that the majority of FAA design standards for Approach Category A and B aircraft within ADG II are identical. However, specific design elements such as runway length and pavement strength will be driven by specific characteristics of the design aircraft, or family of aircraft.

DESIGN STANDARDS

The primary airfield facilities at Bandon State Airport are designed to meet Airplane Design Group I (ADG I) standards. The anticipated change in design aircraft will result in a change in design standards to Airplane Design Group II (ADG II) during the current planning period. As a result, several existing facilities will require upgrading to meet FAA standards during the current planning period based on forecast demand.

The current design aircraft is a multi-engine turboprop included in Airplane Design Group I and Approach Category B (approach speeds 91 knots or more but less than 121 knots), which corresponds to ARC B-I. This designation was identified for both the current and future design aircraft in the 2004 Airport Layout Plan Report and appears applicable to current conditions. The future design aircraft is a medium size business jet included in Airplane Design Group II and Approach Category B, which corresponds to ARC B-II.

Based on the growing popularity of larger single-engine turboprops (Pilatus PC12, Cessna Grand Caravan, etc.) in the general aviation fleet and their established use of Bandon State Airport, the potential exists for the FAA substantial use threshold (500 annual operations) for ADG II aircraft to be reached with ARC A-II aircraft, prior to reaching the threshold with ARC B-II aircraft. This could result in phased ADG II facility upgrades (runway width, parallel taxiway width and runway separation, runway protected areas, apron taxilanes, etc.) to meet basic ADG II standards, followed by a runway extension when demand is sufficient to meet FAA requirements for the future (B-II) design aircraft. However, as noted earlier, the common standards defined for Approach Category A and B aircraft in ADG II will minimize complications associated with phased implementation, should that be required.

Organization of Materials

This chapter evaluates facility requirements from two perspectives: (1) conformance of existing facilities with applicable Federal Aviation Administration (FAA) airport design and airspace planning standards; and (2) new demand based facility needs that reflect the updated aviation activity forecasts presented in Chapter Three.

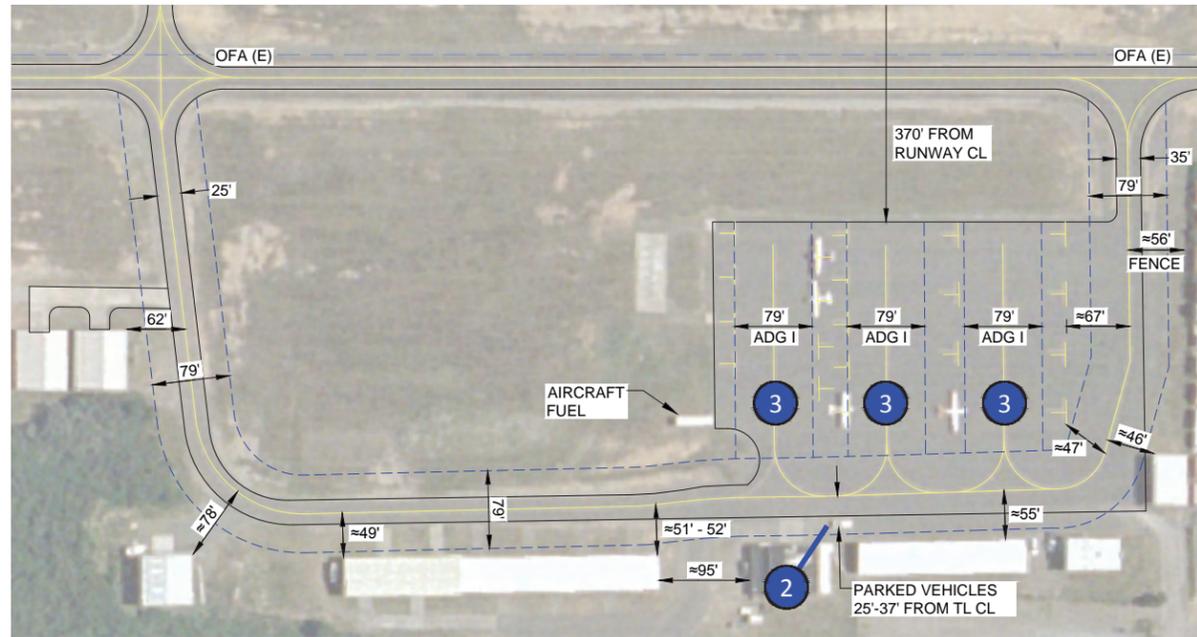
The evaluation of conformance with current (ADG I) and future (ADG II) FAA airport design standards and airspace planning criteria will support development alternatives analyses (Chapter 5), particularly as it relates to changes in current facility configurations.

Any existing nonconforming items will be identified on the updated Airport Layout Plan with recommended disposition noted. The evaluation of demand driven items will reflect in gross numbers, new facility needs such as runway length requirements, hangar spaces and aircraft parking positions based on forecast demand and the needs of the design aircraft. Items such as lighting and navigational aids are evaluated based on the type of airport activity, airport classification and capabilities.

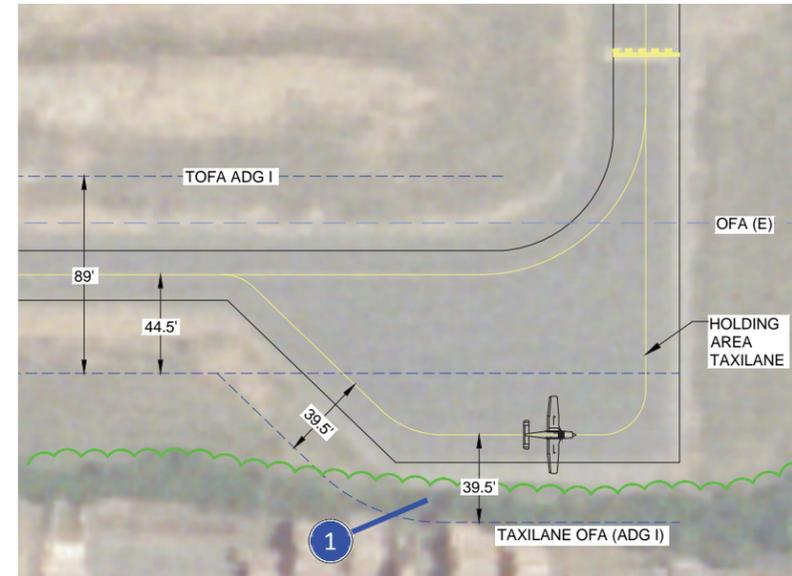
The updated inventory of existing facilities presented in Chapter 2 and site visits were used to evaluate/verify conformance with FAA standards. Figures 4-1 and 4-2 depict non-conforming items identified for both the current ADG I and the future ADG II design standards described in this chapter. It is noted that the existing runway-taxiway system and adjacent landside facilities have been designed to meet ADG I standards; the identification of non-conformance to ADG II standards is only intended to identify specific facilities that will require modification or replacement when the ADG II standards are actually implemented.

The most common nonstandard items identified in this evaluation are aircraft (wingtip) obstruction clearances defined for taxilanes in the terminal area and along the outer edge of the aircraft hold area adjacent to the Runway 34 threshold. Although the clearances vary, most aircraft movements occur without incident. However, as facilities are updated or replaced (aircraft parking or hangars), new facilities should be designed to conform with the appropriate design standards. It is also observed that vehicles are routinely parked adjacent to taxilanes, within taxilane object free areas (OFA), which is not consistent with FAA clearance standards for taxiing aircraft. Restricting vehicle parking adjacent to defined taxilanes should be considered to address this non-conforming item. The runway and parallel taxiway meet all applicable ADG I design standards.

Detailed definitions of the standards and their application at the airport are provided throughout the chapter. The reader is encouraged to consult the Glossary of Aviation Terms provided previously to clarify technical information.



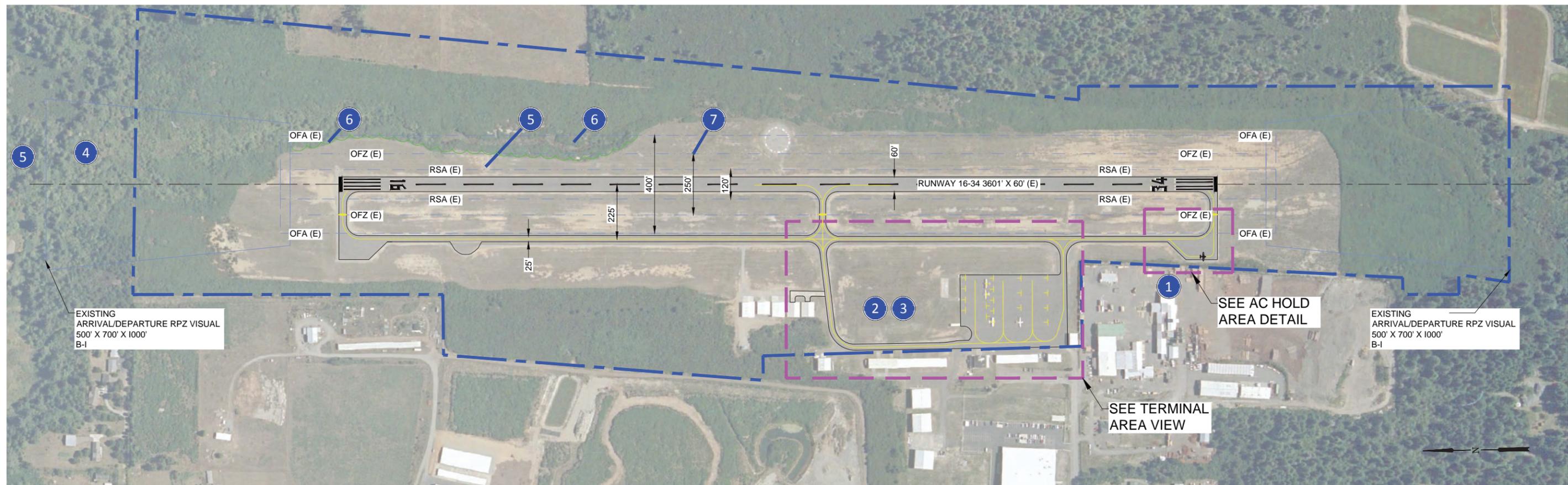
TERMINAL AREA VIEW



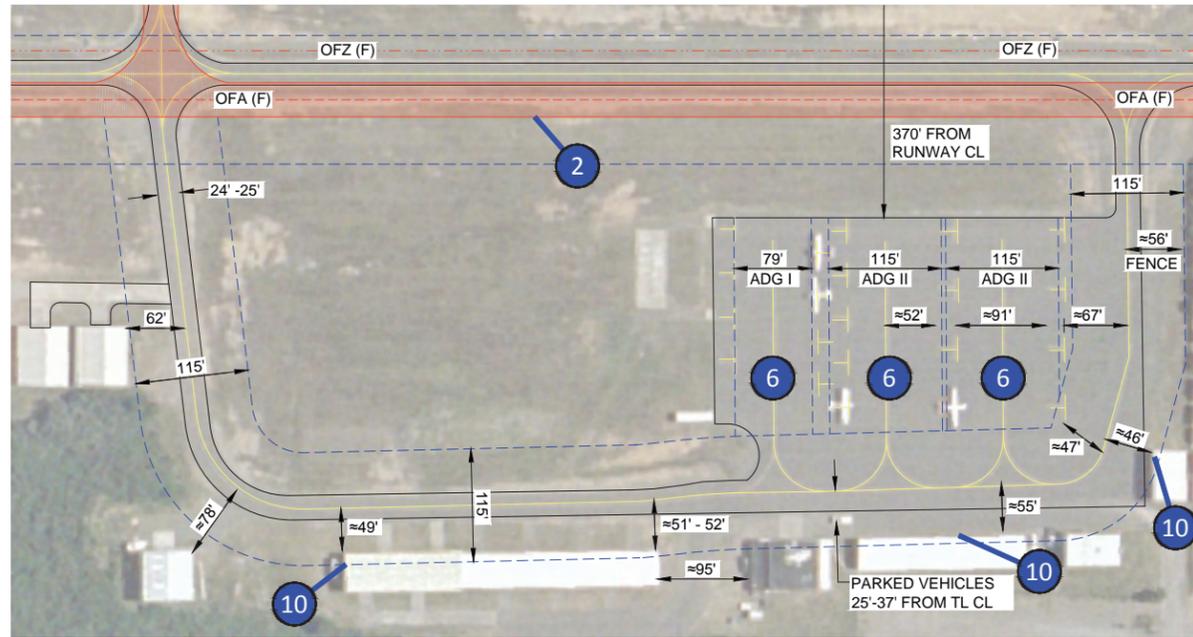
AC HOLD DETAIL

LEGEND	
1	HOLD AREA TAXILANE OFA (WINGTIP CLEARANCES - BUSHES, FENCE)
2	TAXILANE OFA (PARKED VEHICLES)
3	TAXILANE OFA (AIRCRAFT PARKING/TIEDOWNS)
4	RPZ (PROPERTY CONTROL)
5	PAPI (VISUAL GLIDE PATH OBSTRUCTED (TREES))
6	RUNWAY OFA, OFZ (BRUSH)
7	RUNWAY OFZ (400' WIDTH)

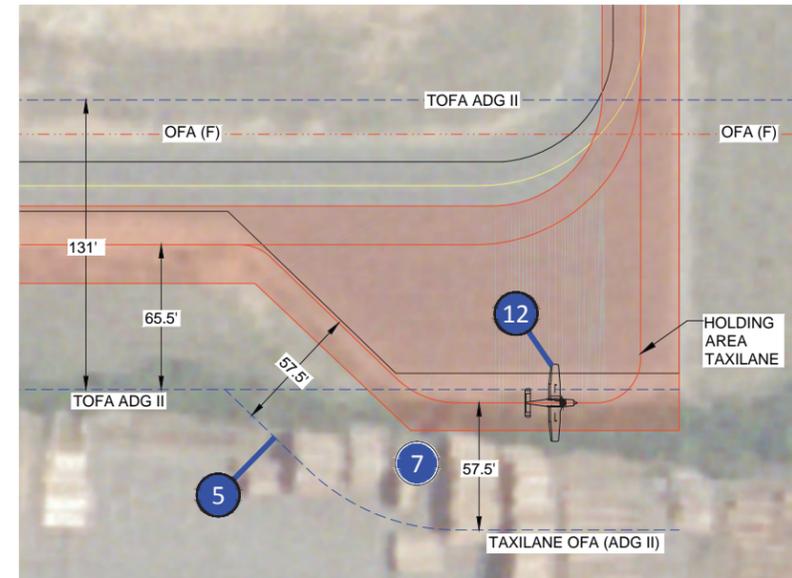
NOTE:
 1. AN UPGRADE TO ADG II STANDARDS MAY REQUIRE RUNWAY EXTENSION TO ACCOMMODATE DESIGN AIRCRAFT, WHICH WOULD EXTEND PROTECTED AREAS ASSOCIATED WITH THE RUNWAY. ACTUAL CONFIGURATION TO BE DETERMINED IN ALTERNATIVES ANALYSIS.



Note: additional airport owned property

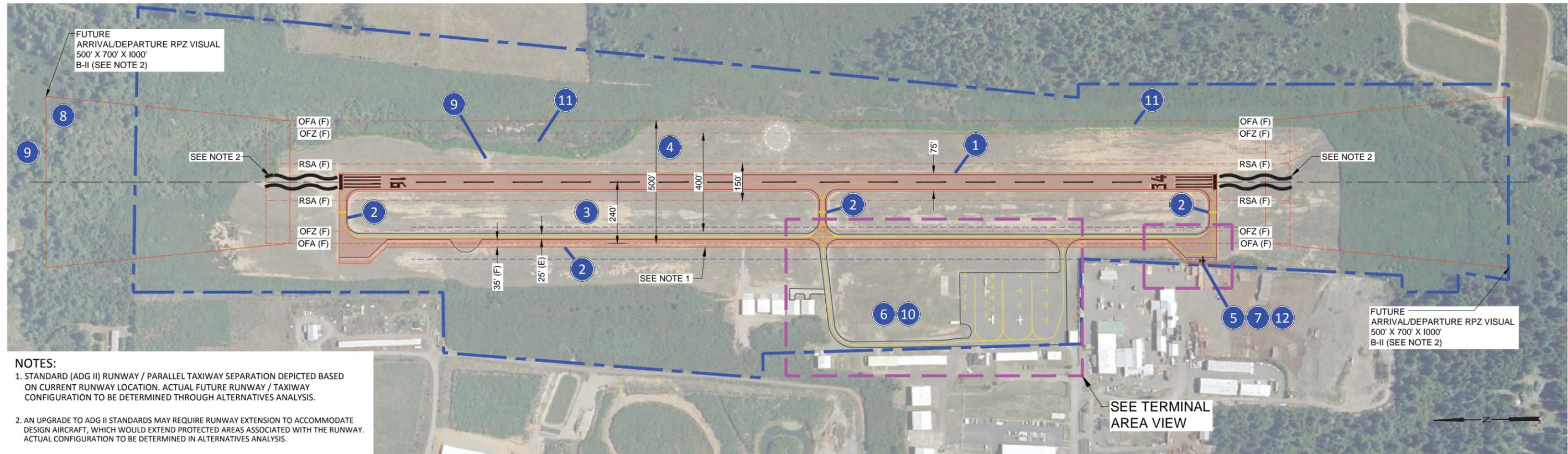


TERMINAL AREA VIEW



AC HOLD DETAIL

LEGEND	
1	RUNWAY (WIDTH INCREASED TO 75')
2	PARALLEL & EXIT TAXIWAYS (WIDTH INCREASED TO 35')
3	RUNWAY CENTERLINE TO PARALLEL TAXIWAY SEPARATION INCREASES TO 240'
4	RUNWAY OBJECT FREE AREA (WIDTH INCREASES TO 500'; LENGTH EXTENDS 300' BEYOND RWY ENDS)
5	TAXIWAY OBJECT FREE AREA (WIDTH INCREASES TO 131')
6	TAXILANE OFA ADG I/II (AIRCRAFT PARKING/TIEDOWNS)
7	HOLD AREA (WINGTIP CLEARANCE FENCE, LUMBER STORAGE)
8	RPZ (PROPERTY CONTROL)
9	PAPI (VISUAL GLIDE PATH OBSTRUCTED (TREES))
10	TAXILANE OFA (BUILDINGS, PARKED VEHICLES)
11	RUNWAY OFA, OFZ (BRUSH, TERRAIN)
12	TAXIWAY OFA (HOLDING AIRCRAFT)



NOTES:
 1. STANDARD (ADG II) RUNWAY / PARALLEL TAXIWAY SEPARATION DEPICTED BASED ON CURRENT RUNWAY LOCATION. ACTUAL FUTURE RUNWAY / TAXIWAY CONFIGURATION TO BE DETERMINED THROUGH ALTERNATIVES ANALYSIS.
 2. AN UPGRADE TO ADG II STANDARDS MAY REQUIRE RUNWAY EXTENSION TO ACCOMMODATE DESIGN AIRCRAFT, WHICH WOULD EXTEND PROTECTED AREAS ASSOCIATED WITH THE RUNWAY. ACTUAL CONFIGURATION TO BE DETERMINED IN ALTERNATIVES ANALYSIS.

2004 Airport Layout Plan Report Recommendations

The 2004 Airport Layout Plan Report for Bandon State Airport provided recommendations for airport facility improvements for a twenty-year planning period that extended to 2022. Table 4-1 provides a summary of the recommended projects and their current status. These facility recommendations will be reviewed to determine their current relevance or the need for modification, revision or replacement as part of the updated facility recommendations in the master plan.

TABLE 4-1: CURRENT STATUS OF THE PREVIOUS AIRPORT LAYOUT PLAN RECOMMENDED PROJECTS

COMPLETED? YES/NO	PROJECTS
No	Tree obstruction removal (2004)
Yes	Restripe hold lines (2004)
No	Easement acquisition-Westside access roadway (2004)
No	Taxilane extension (20,000 lbs., 20' x 165') (2004)
No	Access roadway (2005)
No	Vehicle parking area (2005)
Yes	Executive hangars (2 at 3,601 square feet in 2005) (3 new hangars constructed since 2005)
No	Apron overlay (per PCI-private property) (2005)
No	Install ASOS (2005)
No	Apron expansion and taxiway extension (2006)
No	Taxiway lighting (MITL) and lighted directional and runway hold signs (2006)
Yes	General airfield pavement maintenance (2006) (Crack Seal Runway, Parallel Taxiway and Main Apron in 2011)
No	Obtain GPS approach for Runway 34-FAA facilities (2006)
No	Runway and parallel taxiway overlay/strength upgrades to 20,000lbs (2008)
Note: Blast Pads (100 ft. by 80 ft.) were installed on both ends of RWY 16/34	

Design Aircraft

As noted in Chapter 3 (Aviation Activity Forecasts), the current and future design aircraft at Bandon State Airport are business class multi-engine turbine aircraft. The current design aircraft is identified as a multi-engine turboprop (typical: Beechcraft King Air 90/100) included in Aircraft Approach Category B and Airplane Design Group I (Airport Reference Code – ARC B-I). The future design aircraft is a medium business jet (typical: Cessna Citation Bravo), included in Aircraft Approach Category B and Airplane

Design Group II (Airport Reference Code – ARC B-II). The design aircraft represents the most demanding aircraft operating at the airport on a regular basis in sufficient numbers to satisfy the FAA’s “substantial use” threshold of 500 annual itinerant operations (takeoffs and landings). At Bandon State Airport, the design aircraft activity includes both locally-based and transient aircraft. In addition to this segment of activity, the airport accommodates a variety of single engine and multi-engine aircraft (both piston and turbine) and helicopters. Figure 3-6 (see Chapter 3, page 29) depicts common aircraft for each ARC.

Airport Design Standards

Federal Aviation Administration (FAA) Advisory Circular 150/5300-13A, Airport Design serves as the primary reference in planning airfield facilities. The design standards are based on Airport Reference Code, Airplane Design Group and Taxiway Design Group. The physical dimensions and required setbacks for facilities typically increase with each incremental step in ARC (larger or faster aircraft) and when reduced approach visibility minimums are provided with instrument approaches. A description of ARC criteria is provided in Chapter 3.

Federal Air Regulations (FAR) Part 77.25, Objects Affecting Navigable Airspace, defines airport imaginary surfaces for runways which are used by aircraft during flight operations in the airport environment. The airspace surfaces begin at runway elevation and extend upward and outward along the approaches and from the sides of the runway/helipad. The defined airspace should be free of obstructions (e.g., structures and other built items, parked aircraft, terrain, trees, etc.) to the greatest extent possible to provide a safe operating environment for aircraft. Part 77 surface dimensions and slopes are determined by the category of runway (utility or larger than utility) and approach capabilities (visual, nonprecision instrument, precision instrument).

The FAA design standards for ARC A/B-I include a sub-category for runways used by “small aircraft exclusively” (aircraft weighing 12,500 pounds or less), which may be used in lieu of the standards defined for runways used by both large and small aircraft. The 2004 Airport Layout Plan for Bandon State Airport identifies the existing and future ARC as B-I and does not appear to utilize “small aircraft exclusively” criteria. The B-I designation is consistent with existing facilities (runway-parallel taxiway separation) and is represented by several planning elements including runway protection zone (RPZ) dimensions and the future runway pavement design strength (20,000 pounds). The 2004 Airport Layout Plan report noted that the current runway obstacle free zone (OFZ) width was 250 feet did not meet the FAA standard (400 feet) for “runways used by large airplanes.”

The 2004 Airport Airspace Plan depicts ultimate Part 77 airspace surfaces consistent with “larger than utility” runways with visual approaches. These standards apply to runways that accommodate aircraft weighing more than 12,500 pounds. The airspace configuration is compatible with both standard visual approaches and instrument approaches with a “circling” procedure, where the pilot must establish and

maintain visual contact with the runway environment prior to reaching the missed approach point while preparing to land.

The future design standards for Bandon State Airport are based on Airplane Design Group II and Approach Category B, which corresponds to ARC B-II. Future airspace planning for Runway 16/34 is based on “larger than utility” standards, consistent with runways that accommodate aircraft weighing more than 12,500 pounds. Based on the operational profile of the airport and the composition of forecast air traffic, airspace planning will be based on future nonprecision instrument approach capabilities. The addition of instrument approach capabilities was identified in the 2004 Airport Layout Plan Report as a priority facility improvement. For planning purposes, it is assumed that a future nonprecision instrument approach would be developed as a “straight-in” procedure to a runway end if feasible (based on FAA airspace evaluation), which requires slightly more demanding nonprecision instrument airspace surfaces. This would also require designating Runway 16/34 as nonprecision instrument rather than visual. As noted in the inventory chapter, the existing runway threshold markings are nonprecision instrument although the runway currently has visual approaches only.

A comparison of existing conditions for Runway 16/34, current (ARC B-I) and future (ARC B-II) design standards are summarized in Table 4-2. A summary of Bandon State Airport’s current conformance with these various standards is presented in Table 4-3. As noted earlier, most airfield facilities at Bandon State Airport currently meet ARC B-I standards and will require upgrading to meet B-II standards. The evaluation of design standards in this chapter will address both current and future standards.

TABLE 4-2: AIRPORT DESIGN STANDARDS SUMMARY (DIMENSIONS IN FEET)

FAA STANDARD	RUNWAY 16/34 EXISTING CONDITIONS¹	AIRPLANE DESIGN GROUP A/B-I² <small>APPROACH VISIBILITY ≥ 1 MILE</small>	AIRPLANE DESIGN GROUP A/B-II² <small>APPROACH VISIBILITY ≥ 1 MILE</small>
Runway Length	3,601	3,320 ⁷	5,250 ¹⁰
Runway Blast Pad - Width	80	80	95
Runway Blast Pad - Length	100	100	150
Runway Width	60	60	75
Runway Shoulder Width	10	10	10
Runway Safety Area <ul style="list-style-type: none"> • Width • Beyond RWY End • Prior to Landing Threshold 	120 240 240	120 240 240	150 300 300
Obstacle Free Zone <ul style="list-style-type: none"> • Width • Beyond RWY End • Prior to Landing Threshold 	250 200 200	400 200 200	400 200 200
Object Free Area <ul style="list-style-type: none"> • Width • Beyond RWY End • Prior to Landing Threshold 	400 240 240	400 240 240	500 300 300
Primary Surface Width	500	500	500
Primary Surface Length (Beyond RWY End)	200	200	200
Runway Protection Zone Length	1,000 ²	1,000	1,000
Runway Protection Zone Inner Width	500 ²	500	500
Runway Protection Zone Outer Width	700 ²	700	700
Runway Centerline to: Parallel Taxiway/Taxilane Centerline Aircraft Parking Line (APL) Building Restriction Line (BRL)	2256 365 ³ 480 ⁴	225 306 ⁸ 376 ⁹	240 306 ⁸ 376 ⁹
Taxiway Width	25	25	35
Taxiway Shoulder Width	10	10	10
Taxiway Safety Area Width	> 49 ⁵	49	79
Taxiway Object Free Area Width	89	89	131
Taxiway Centerline to Fixed / Movable Object	44.5	45.5	65.5
Taxilane OFA Width	< 79 ⁶	79	115
Taxilane CL to Fixed/Movable Object	< 39.5 ⁶	39.5	57.5

Table 4-2 Notes:

1. Airfield dimensions as depicted on 2004 Airport Layout Plan (ALP).
2. Larger Than Utility Visual Approach Runway (Per FAR Part 77). Runway Protection Zone dimensions based on approach visibility minimums not lower than 1-mile (Per AC 150/5300-13A) as depicted on 2004 ALP.
3. No Aircraft Parking Line (APL) depicted on 2004 ALP. The nearest aircraft parking position is located approximately 365 feet from runway centerline.
4. No BRL depicted on the 2004 ALP drawing. The nearest hangar on the west side of the runway is approximately 480 feet from runway centerline. The nearest off airport structure is located approximately 360 feet from runway centerline (south end, west side).
5. The main section of parallel taxiway is located on former runway (Apprx. 50' wide); the paved surface serves as the taxiway safety area.
6. The wingtip clearance provided on the south aircraft hold area measured from 12.5 feet from outer edge of pavement ($\frac{1}{2}$ ADG I taxiway width standard) is less than 39.5 feet (bushes, fence). Apron taxilane clearances parked aircraft vary (See figure 4-1).
7. Per FAA Runway Length Model: Runway lengths required to accommodate 100 percent of small airplanes (12,500 pounds or less) at Bandon State Airport. 63.1 degrees F, 17-foot change in runway centerline elevation.
8. Distance from runway centerline required to accommodate an 8-foot aircraft tail height without penetrating the 7:1 Transitional Surface extending from a 500 foot wide Primary Surface. This distance also clears the existing parallel taxiway OFA and the runway OFA. Setbacks for larger aircraft types (i.e., larger turboprops or business jets, etc.) would be based on tail height clearance of Transitional Surface slope. Example: parking setback required for Pilatus PC12 (14' tail height) is approximately 348 feet from runway centerline.
9. Distance required to accommodate 18-foot structures (typical small/medium conventional hangar roof heights) without penetrating the 7:1 Transitional Surface extending from a 500 foot wide Primary Surface when ground elevation is the same for the runway and building. Setbacks for larger hangars or for hangars constructed in areas with terrain elevated above runway elevation would depend on roof elevation and actual clearance of Transitional Surface slope.
10. Per FAA Advisory Circular 150/5325-4B Runway Length Planning, the runway length required to accommodate 75 percent of large airplanes (under 60,000 pounds) at 60 percent useful load at Bandon State Airport.

TABLE 4-3: BANDON STATE AIRPORT CURRENT CONFORMANCE WITH FAA DESIGN STANDARDS

ITEM	AIRPLANE DESIGN GROUP I	AIRPLANE DESIGN GROUP II
	A&B AIRCRAFT APPROACH VISIBILITY 1 MILE	A&B AIRCRAFT APPROACH VISIBILITY 1 MILE
Runway Safety Area	Yes	No ³
Runway Object Free Area	Yes	No ³
Runway Obstacle Free Zone	No ¹	No ³
Taxiway Safety Area	Yes	No ³
Taxiway Object Free Area	Yes	No ³
Taxilane Object Free Area	No ²	No ³
Building Restriction Lines	Yes	Yes
Aircraft Parking Lines	Yes	Yes
Runway Protection Zones	Yes	Yes
Runway - Parallel Taxiway Separation	Yes	No ³
Runway Width	Yes	No ³
Runway Length	Yes	No ³
Taxiway Width	Yes	No ³

Table 4-3 Notes:

1. Several apron taxilane object free area clearances (to parked aircraft, etc.) are less than standard.
2. Existing OFZ (250 feet wide) does not meet dimensional standard for runways that accommodate larger aircraft (>12,500#), although the width is consistent with existing runway pavement strength (12,500#).
3. Requires upgrade to meet future ARC B-II standards; runway length determined by requirements of design aircraft or family of aircraft.

Airport Planning & Design Standards Note:

The following FAA standards are recommended for use in evaluating Runway 16/34 and its taxiway system:

Runway 16/34 (Existing) – Airport Reference Code (ARC) B-I. Runway design standards for aircraft approach category A & B runways with not lower than 1 statute mile approach visibility minimums. The existing Runway Protection Zone (RPZ) for Runway 16/34 is based on not lower than 1 mile approach visibility minimums.

Runway 16/34 (Future) – Airport Reference Code (ARC) B-II. Runway design standards for aircraft approach category A & B runways with not lower than 1 statute mile approach visibility minimums. No change in future RPZ dimensions.

FAR Part 77 airspace planning criteria based on existing “larger than utility runways” with nonprecision approaches with not less than 1 mile visibility.

All references to the “standards” are based on these assumptions, unless otherwise noted (Per FAA Advisory Circular 150/5300-13A and FAR Part 77.25)

RUNWAY SAFETY AREA (RSA)

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

By FAA design standard, the runway safety area “shall be:

1. *cleared and graded and have no potentially hazardous ruts, humps, depressions, or other surface variations;*
2. *drained by grading or storm sewers to prevent water accumulation;*
3. *capable, under dry conditions, of supporting snow removal equipment, aircraft rescue and firefighting equipment, and the occasional passage of aircraft without causing structural damage to the aircraft; and*
4. *free of objects, except for objects that need to be located in the runway safety area because of their function. Objects higher than 3 inches above grade should be constructed on low impact resistant supports (frangible mounted structures) of the lowest practical height with the frangible point no higher than 3 inches. Other objects such as manholes should be constructed at grade. In no case should their height exceed 3 inches.”*

Based on a recent visual inspection conducted during the master plan inventory, the current RSA is cleared and graded and appears to meet B-I dimensional standards and surface condition (gradient and compaction) requirements. An upgrade to B-II standards and any future runway extension(s) will require RSA improvements. Items located within the RSA required by function (runway edge lights, etc.) must be installed with break-away mounts.

Runway Safety Area (RSA)	
Existing Standard	Future Standard
ARC B-I (Approach Visibility ≥ 1 mile)	ARC B-II (Approach Visibility ≥ 1 mile)
120 feet wide and extends 240 feet beyond each departure end of runway.	150 feet wide and extends 300 feet beyond each departure end of runway.
The RSA appears to be free of built items except those with locations fixed by function on break-away mounts. The RSA surface appears to meet gradient and compaction standards. Periodic maintenance and clearing is required.	The RSA’s dimensions would increase to meet standards. The RSA surface would need to meet gradient and compaction standards. The area needs to be free of built items except those with locations fixed by a function on break-away mounts. Periodic maintenance and clearing is required.

RUNWAY OBJECT FREE AREA (OFA)

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

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

Based on a recent visual inspection conducted during the master plan inventory, the current OFA is free of built items and parked aircraft and is relatively level. Areas of vegetation (brush, small bushes, etc.) were observed in the northeast section that appear to exceed the standard height limitations (> 3” above grade). Vegetation located in the OFA should be removed and the area graded. As with the RSA noted earlier, any future runway extensions or an upgrade to B-II standards will require corresponding OFA improvements. Items located within the OFA required by function (PAPI, wind cones, etc.) require break-away mounts.

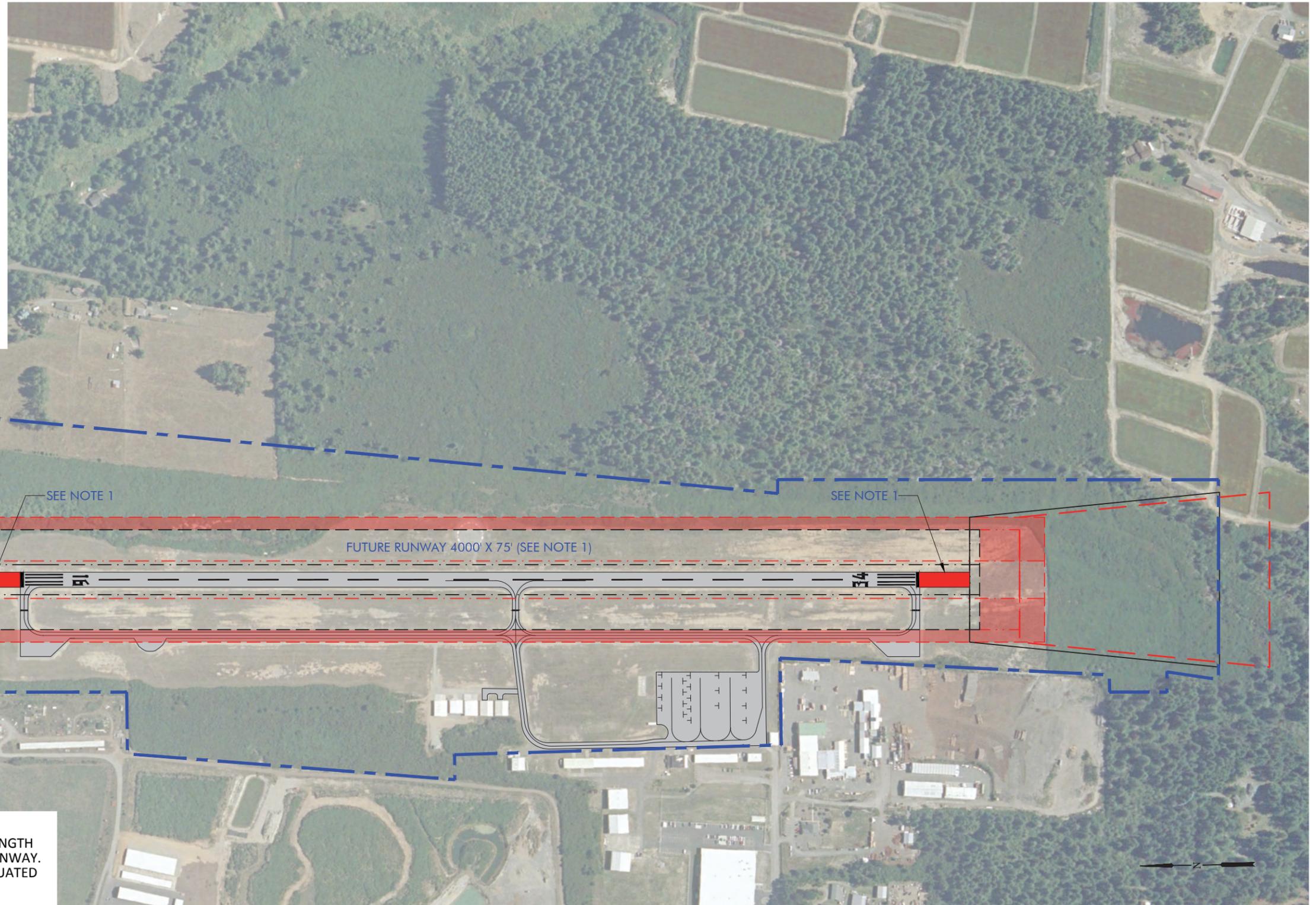
An increase in OFA width will require approximately 50 additional feet of vegetation removal and grading along the east side of the runway and additional clearing/grading beyond the runway ends. The future OFA along the west side of the runway is clear and contains the west parallel taxiway. A summary of the OFA requirements based on the existing B-I and future B-II standards are presented below:

Runway Object Free Area (OFA)	
Existing Standard	Future Standard
ARC B-I (Approach Visibility ≥ 1 mile)	ARC B-II (Approach Visibility ≥ 1 mile)
400 feet wide and extends 240 feet beyond each departure end of runway.	500 feet wide and extends 300 feet beyond each departure end of runway.
The OFA appears to meet FAA grading standards, although encroaching vegetation is observed in the northeast section that appears to exceed the 3” above grade height limit. Vegetation removal and grading is recommended.	The OFA footprint would need to be expanded to meet the dimensional requirements of B-II for either the current or extended runway and appropriate grading and obstruction clearing will be required.

Figure 4-3 depicts the footprint of the runway object free area and runway safety area that are associated with both the current ARC B-I and future ARC B-II based on the existing 1-mile approach visibility minimums. An upgrade in design standards requires a lateral and longitudinal (length beyond the ends of the runway) expansion of the protected areas for the existing runway and any future extensions.

LEGEND

-  EXISTING B-I OBJECT FREE AREA
NOT LOWER THAN 1 MILE VISIBILITY (4081' X 400')
-  EXISTING B-I OBJECT FREE ZONE
NOT LOWER THAN 1 MILE VISIBILITY (4001' X 400')
-  EXISTING B-I RUNWAY SAFETY AREA
NOT LOWER THAN 1 MILE VISIBILITY (4081' X 120')
-  FUTURE B-II OBJECT FREE AREA RESERVE
NOT LOWER THAN 1 MILE VISIBILITY (4601' X 500')
-  FUTURE B-II OBJECT FREE ZONE RESERVE
NOT LOWER THAN 1 MILE VISIBILITY (4401' X 400')
-  FUTURE B-II RUNWAY SAFETY AREA RESERVE
NOT LOWER THAN 1 MILE VISIBILITY (4601' X 150')
-  EXISTING B-I RUNWAY PROTECTION ZONE
-  FUTURE B-II RUNWAY PROTECTION ZONE
-  PROPERTY LINE



NOTE:
 1. FOR ILLUSTRATION PURPOSES, A FUTURE RUNWAY LENGTH OF 4000' IS DEPICTED CENTERED ON THE EXISTING RUNWAY. ACTUAL RUNWAY EXTENSION OPTIONS WILL BE EVALUATED IN THE ALTERNATIVES ANALYSIS.

OBSTACLE FREE ZONE (OFZ)

The obstacle free zone (OFZ) is a plane of clear airspace extending upward above runway elevation that are intended to protect close-in obstructions that may create hazards for aircraft. The FAA defines the following clearing standard for the OFZ:

“The obstacle free zone clearing standard precludes taxiing and parked airplanes and object penetrations, except for frangible visual NAVAIDS [navigational aids] that need to be located in the obstacle free zone because of their function.”

The FAA defines the Runway Obstacle Free Zone (ROFZ) as:

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

The current and future FAA standard OFZ width for Runway 16/34 is 400 feet wide based on operations by large aircraft (weighing more than 12,500 pounds). The 2004 Airport Layout Plan Report noted that the current 250 foot wide OFZ should be upgraded to meet the width standard for the large airplanes, although the standard is not reflected on the 2004 Airport Layout Plan (ALP) drawing.

Based on a recent visual inspection conducted during the master plan inventory, the current (250 feet wide) OFZ appears to be level and is free of built items, vegetation, and parked or taxiing aircraft. Runway lights, precision approach path indicator (PAPI) units, runway end identifier lights (REIL), and directional signage have locations fixed by function within the OFZ and meet the FAA frangibility (break away) standard. The current aircraft hold lines on the three exit taxiways are located 125 feet from runway centerline, which coincides with the outer edge of the OFZ.

The increase in width to 400 feet coincides with the width dimension of the current runway OFA. As a result, the improvements recommended earlier within the current OFA will also apply to the expanded OFZ. The existing aircraft hold lines on the three exit taxiways will require shifting to the edge of the expanded OFZ (200 feet from runway centerline). Any future runway extension(s) will require corresponding extensions of the OFZ, although no increase in width beyond 400 feet is required.

TAXIWAY SAFETY AREA

Taxiway safety areas serve a similar function as runway safety areas and use the same design criteria for surface condition (see description of runway safety area provided earlier in this chapter), with varying dimensions based on airplane design group. The taxiway safety area dimensions increase when the design group changes from ADG I to ADG II.

It is noted that safety area standards do not apply to *taxilanes* typically located within hangar developments or aircraft parking aprons. Taxilanes provide aircraft access within a parking or hangar area; taxiways provide aircraft access between points on the airfield and serve runways (e.g. parallel taxiways and exit taxiways).

The parallel taxiway and exits taxiways are designed to accommodate the same design aircraft as the runway (Airplane Design Group I). The current ADG-I taxiway safety area standard is 49 feet (24.5 feet from taxiway centerline). The main section of the parallel taxiway (25 feet wide) is located on the former runway (approximately 50 feet wide); the outer 12.5 feet of paved area is located entirely within the ADG I taxiway safety area footprint. Based on a recent visual inspection conducted during the master plan inventory, all existing taxiway safety areas appear to meet the surface condition and obstruction clearing standards.

The future ADG II taxiway safety area standard is 79 feet wide (39.5 feet from taxiway centerline). It is noted that the ADG II parallel taxiway-runway separation increases to 240 feet from the existing 225 feet. A relocation of the parallel taxiway (or runway) would be required to meet standards and the ADG II taxiway safety area standards would be applied. Taxiway edge reflectors, edge lights, signs, etc. must be mounted on frangible (break away) mounts.

As with runway safety areas, the ground surface located immediately adjacent to the taxiways periodically requires maintenance or improvement to adequately support the weight of an aircraft or an airport vehicle. Grading and/or soil compaction within taxiway safety areas should be completed as needed, and grass, brush or other debris should be regularly cleared to maintain FAA standards. Taxiway pavement edges should be periodically inspected to ensure that grass, dirt or gravel build ups do not exceed 3 inches.

Taxiway Safety Area (TSA)	
Existing Standard	Future Standard
ADG-I	ADG-II
49 feet wide, 24.5 feet from taxiway centerline	79 feet wide, 39.5 feet from taxiway centerline
The TSA appears to be free of built items except those with locations fixed by function on break-away mounts. The TSA surface (paved) appears to meet gradient and compaction standard. Periodic maintenance and vegetation removal is required.	The future TSA dimensions would increase to meet design group II standards. The TSA needs to be free of built items except those with locations fixed by function on break-away mounts. The TSA surface needs to meet gradient and compaction standards.

TAXIWAY/TAXILANE OBJECT FREE AREA

Taxiway and taxilane object free areas (OFA) are intended to provide unobstructed taxi routes (adequate wingtip clearance) for aircraft. The outer edge of the OFA defines the recommended standard distance from taxiway or taxilane centerline to a fixed or moveable object. The FAA clearing standard prohibits service vehicle roads, parked aircraft, and above ground objects (hangars, other built items, etc.), except for objects with locations that are fixed by function (navigational aids, airfield signs, etc.). The applicable design standard (ADG-I or ADG-II) is determined by the largest size of aircraft that may be accommodated in aircraft parking areas or hangars served by that taxiway/taxilane.

TAXIWAYS AND TAXILANES

The taxiways and taxilanes at Bandon State Airport are currently designed to be meet ADG I standards. These include taxilanes within the main apron area and in the various aircraft hangar areas on the airport as well as a parallel taxiway and runway exit taxiways. The ADG I OFA standard is 89 feet wide (44.5 feet from centerline) for taxiways and 79 feet wide (39.5 feet from centerline) taxilanes. The future ADG-II standards are 131 feet wide taxiway OFA, (65.5 feet from centerline) and the taxilane OFA 115 feet wide (57.5 feet from centerline).

The main apron taxilane clearances located between tiedown rows vary, with approximately 79 feet provided between small airplane tiedowns anchors. However, when aircraft are located in the tiedowns, portions of the aircraft protrude into the adjacent taxilane, which reduces the taxilane OFA clearance. The apron currently accommodates both ADG I and ADG II aircraft, with several larger parking positions located in the southern two rows on the apron. Reconfiguration of the main apron taxilanes and aircraft parking rows to meet the applicable standard should be incorporated into future facility upgrades or apron expansion.

Since the type of aircraft located within a particular hangar can change over time, the appropriate method for determining hangar taxilane clearance standards is based on the largest aircraft that can be physically accommodated within the hangar. ADG-II standards are applied to taxilanes serving larger hangars (door openings 50 feet and larger) and ADG-I standards are applied to taxilanes serving small individual hangars or T-hangars.

Taxiway/Taxilane OFA	
Existing Standard	Future Standard
ADG-I	ADG-II
Taxiway Object Free Area 89 feet wide (44.5 feet from centerline)	Taxiway Object Free Area 131 feet wide (65.5 feet from centerline)
Taxilane Object Free Area 79 feet wide (39.5 feet from centerline)	Taxilane Object Free Area 115 feet wide (57.5 feet from centerline)
Some taxilanes on the main apron do not meet the current OFA standards.	Some taxilanes and aircraft parking areas on the main apron area require reconfiguration to meet the future standard.

BUILDING RESTRICTION LINE (BRL)

A building restriction line (BRL) identifies the minimum setback required to accommodate a typical building height such as a T-hangar or large conventional hangar, based on the ability to remain clear of all runway and taxiway protected areas on the ground, and the protected airspace surrounding a runway. BRL locations are directly associated with the primary surface width, which determines where the lateral 7:1 transitional surface slope begins. The current (visual) and future (nonprecision instrument) Runway 16/34 requires a 500-foot wide primary surface based on standards defined for “Larger than Utility Runways.”

The 2004 Airport Layout Plan does not depict existing or future BRLs for Runway 16/34, although the nearest on-airport building (hangar) is located approximately 480 feet from runway centerline. At this location, a building height of approximately 32 feet (above runway elevation) could be accommodated without penetrating the runway transitional surface.

There is no absolute dimensional standard for establishing BRL locations other than avoiding conflicts with defined runway-taxiway setbacks. BRLs are commonly defined by the type of buildings to be accommodated (T-hangars, small conventional hangars, large conventional hangars, etc.). An 18-foot BRL is commonly used to accommodate both T-hangars and small conventional hangars. For Runway 16/34, an 18-foot BRL would be located 376 feet from runway centerline:

$$\text{Example: 18-foot BRL} = (18 \times 7) + 250 = 376 \text{ feet from runway centerline}$$

The calculation reflects the rising 7:1 slope for the transitional surface multiplied by the building height (18 feet), added to one-half (250 feet) of the 500-foot primary surface width. This building setback is compatible with both B-I and B-II runway-parallel taxiway configurations. Larger structures would require increased setbacks to avoid penetrating the runway transitional surface.

AIRCRAFT PARKING LINE

Similar to a BRL, the aircraft parking line (APL) represents the minimum setback required for locating aircraft parking in order to be clear of all runway and taxiway protected areas on the ground, and the protected airspace surrounding a runway. The location of the APL is generally determined by the more demanding of runway airspace clearance and parallel taxiway obstruction clearance.

The 2004 Airport Layout Plan does not depict existing or future APL for Runway 16/34, although the nearest aircraft parking (front edge of main apron) is located approximately 365 feet from runway centerline. At this location, an aircraft tail height of approximately 16 feet (above runway elevation) could be accommodated without penetrating the runway transitional surface.

A tail height of 8 feet is typical of most small single-engine aircraft and is often used to determine the APL for small airplane tiedowns. A variety of small and medium business aircraft including single-engine

turboprops, multi-engine turboprops and business jets have tails heights ranging from 8 to 15 feet. Parking areas for larger aircraft require additional setbacks to avoid penetrating the runway transitional surface. The Pilatus PC-12NG, an ADG II aircraft commonly operated at Bandon State Airport, has a tail height of 14 feet. Using the same calculation method described for the BRL, the minimum parking setback for this aircraft is approximately 348 feet from runway centerline, compared to 306 feet for an aircraft with an 8-foot tail height. Both setbacks are compatible with B-I and B-II parallel taxiway OFA clearances. Future apron planning should ensure that appropriate parking setbacks are observed for the different sizes of aircraft being accommodated.

RUNWAY PROTECTION ZONES (RPZ)

The FAA provides the following definition for runway protection zones:

“The RPZ’s [runway protection zone] function is to enhance the protection of people and property on the ground. This is best achieved through airport owner control over RPZs. Control is preferably exercised through the acquisition of sufficient property interest in the RPZ and includes clearing RPZ areas (and maintaining them clear) of incompatible objects and activities. The RPZ is trapezoidal in shape and centered about the extended runway centerline. The RPZ’s begins 200 feet beyond the end of the area useable for takeoff or landing.” The central portion and controlled activity area are the two components of the RPZ. The central portion of the RPZ extends from the beginning to the end of the RPZ, centered on the [extended] runway centerline and is equal to the width of the runway OFA.

Runway protection zones (RPZ) with buildings, roadways, or other items are not fully consistent with FAA standards. In October 2012, the FAA released interim guidance regarding RPZs and incompatible land uses, particularly roads. The policy directs airport sponsors to evaluate any planned changes to existing RPZs that introduce or increase the presence of roads or other incompatible land uses in RPZs. Existing roads or land uses within RPZs are also to be evaluated during master planning to determine if feasible alternatives exist for realignment of roads outside RPZs or to modify the land uses. Any proposed increase in the length of Runway 16/34 that increases the presence of incompatible land uses in the RPZs is subject to review by FAA headquarters in Washington D.C. The evaluation of the RPZ configuration will be included in all runway evaluation options to be addressed in the alternatives analysis. The FAA recommends that airport sponsors control the RPZs through ownership whenever possible, although avigation easements¹ are commonly used when outright purchase is not feasible.

The current RPZ dimensions are compatible with approach visibility minimums of not lower than 1-statute mile, which is compatible with both visual approaches and most nonprecision instrument

¹ An avigation easement (avigation = aviation + navigation) involves the purchase of airspace rights over a particular defined ground area. The easement normally limits the maximum height of any natural or built items (to coincide with the runway approach surface slope) and may include provisions restricting the type of activities permitted. Compensation is negotiated between the airport owner and property owner.

approaches (without an approach lighting system) for both B-I and B-II runways. Approximately 363 feet of the outer end of the Runway 16 RPZ extends off airport property. The entire RPZ for Runway 34 is located on airport property. The location of one or both of the existing RPZs may change if the runway is extended in the future (see runway length section).

Runway Protection Zones (RPZ)	
Existing Standard	Future Standard
ARC B-I (Approach Visibility \geq 1 mile)	ARC B-II (Approach Visibility \geq 1 mile)
Runway Protection Zone (RPZ) Length- 1,000 feet Inner Width- 500 feet Outer Width- 700 feet	Runway Protection Zone (RPZ) Length- 1,000 feet Inner Width- 500 feet Outer Width- 700 feet
Current runway protection zone dimensions meet standards.	No change in current RPZ dimensions.

RUNWAY - PARALLEL TAXIWAY SEPARATION

Runway 16/34 has a full-length west parallel taxiway (Taxiway A) with a runway centerline to centerline separation of 225 feet, which meets the current B-I dimensional standard. The future B-II standard runway-taxiway separation is 240 feet. It is noted that B-II runway and taxiway widths also increase which may affect centerline locations and lateral separations. Based the current runway centerline location, it appears that a shifted and widened parallel taxiway can be accommodated within airport property without impacting existing hangars or aircraft parking. However, a lateral shift of the south aircraft hold area cannot be accommodated in its current location or further south within the current airport property boundary (SW corner of airport property). Current and future parallel taxiway separation standards based are presented below:

Runway-Parallel Taxiway Separation	
Existing Standard	Future Standard
ARC B-I (Approach Visibility \geq 1 mile)	ARC B-II (Approach Visibility \geq 1 mile)
Runway-Parallel Taxiway Separation is 225 feet	Runway-Parallel Taxiway Separation is 240 feet
The current runway-parallel taxiway separation meets the existing standard.	An increase in runway to parallel taxiway separation is required to meet the future standard.

FAR Part 77 Surfaces

Airspace planning for U.S. airports is defined by Federal Air Regulation (FAR) Part 77.25, Objects Affecting Navigable Airspace. FAR Part 77 defines imaginary surfaces (airspace) which are established to protect the area the vicinity of a runway or helipad. The defined airspace surfaces should be free of obstructions (e.g., structures, parked aircraft, trees, terrain, etc.) to the greatest extent possible to provide a safe operating environment for aircraft. Built items that penetrate protected airspace that cannot be

removed or lowered are often identified with red obstruction lights to provide a affirmative visual recognition of the potential hazard to pilots.

Figures 4-4 and 4-5 on the following pages illustrate plan and isometric views of generic Part 77 surfaces. Table 4-4 summarizes the airspace surface dimensions for Bandon State Airport based on current and future approach/visibility options.

The Part 77 surfaces identified on the 2004 Airport Airspace Plan are consistent with “Larger than Utility” runways with visual approaches (20:1 approach slope). The 2004 Airport Airspace Plan identified 32 obstructions (31 trees and 1 frangible wind cone) to the Part 77 airspace surfaces. No areas of terrain penetration are identified.

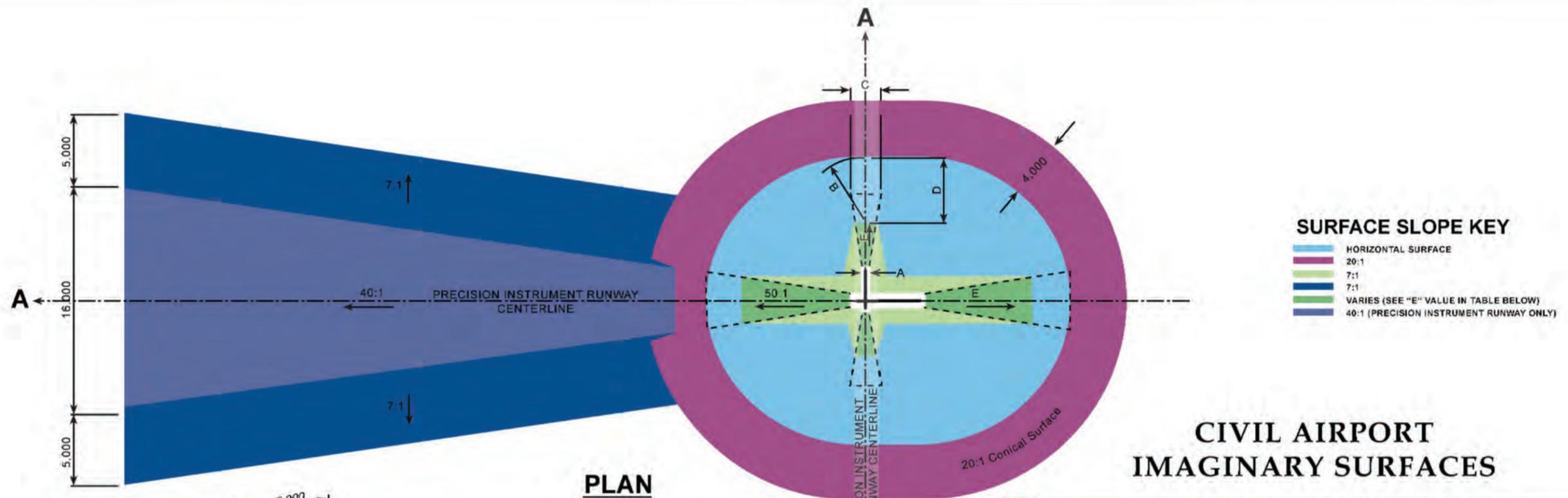
The recommended future airspace planning criteria for Runway 16/34 maintains the “Larger than Utility” designation but changes the approach classification to nonprecision instrument (34:1 approach slope). This recommendation reflects previous and current facility planning and the potential for developing a straight-in instrument approach to the runway based on relatively flat terrain in the vicinity of the airport. In the event that the FAA’s design criteria for a straight-in approach cannot be met, a circling procedure would be considered that is compatible with the current 20:1 visual approach surfaces.

The recommended change in planning criteria will affect several airspace surfaces for Runway 16/34 and may increase the number of tree obstructions, particularly for the runway approach surfaces. The updated airspace plan developed for the master plan will depict the airspace surfaces and adjust existing obstruction data accordingly. An updated obstruction survey is required by FAA for developing a new instrument approach procedure. Once the obstruction survey is completed, FAA will conduct an airspace evaluation to determine the feasibility of available approach design options. The updated obstruction data, including any changes related obstruction removal, can be incorporated into the airspace plan.

All new construction on or in the immediate vicinity of the airport should routinely involve FAA review for airspace compatibility. FAA Form 7460-1, Notice of Proposed Construction or Alternation, should be prepared and submitted to FAA at least 60 to 90 days prior to planned construction. 7460 forms should be submitted by Oregon Department of Aviation (ODA) for projects located on the Airport and submitted by the applicant for any projects located off airport property. The FAA reviews all proposed development to determine if the proposed action would create any obstructions to FAR Part 77 airspace surfaces. In general, the FAA will object to proposals that result in a penetration to any FAR Part 77 airspace surfaces on the basis of safety.

TABLE 4-4: FAR PART 77 AIRSPACE SURFACES

ITEM	EXISTING RUNWAY 16/34 <i>Larger than Utility Visual</i>	FUTURE RUNWAY 16/34 <i>Larger than Utility Non-Precision Instrument</i>
Width of Primary Surface	500 feet	500 feet
Transitional Surface	7:1 Slope to 150 feet above runway	7:1 Slope to 150 feet above runway
Horizontal Surface Elevation/Radius	150 feet above airport elevation/5,000 feet	150 feet above airport elevation/10,000 feet
Conical Surface	20:1 for 4,000	20:1 for 4,000
Approach Surface Length	5,000	10,000
Approach Surface Slope	20:1	34:1
Approach Surface Width at End	1,500	3,500

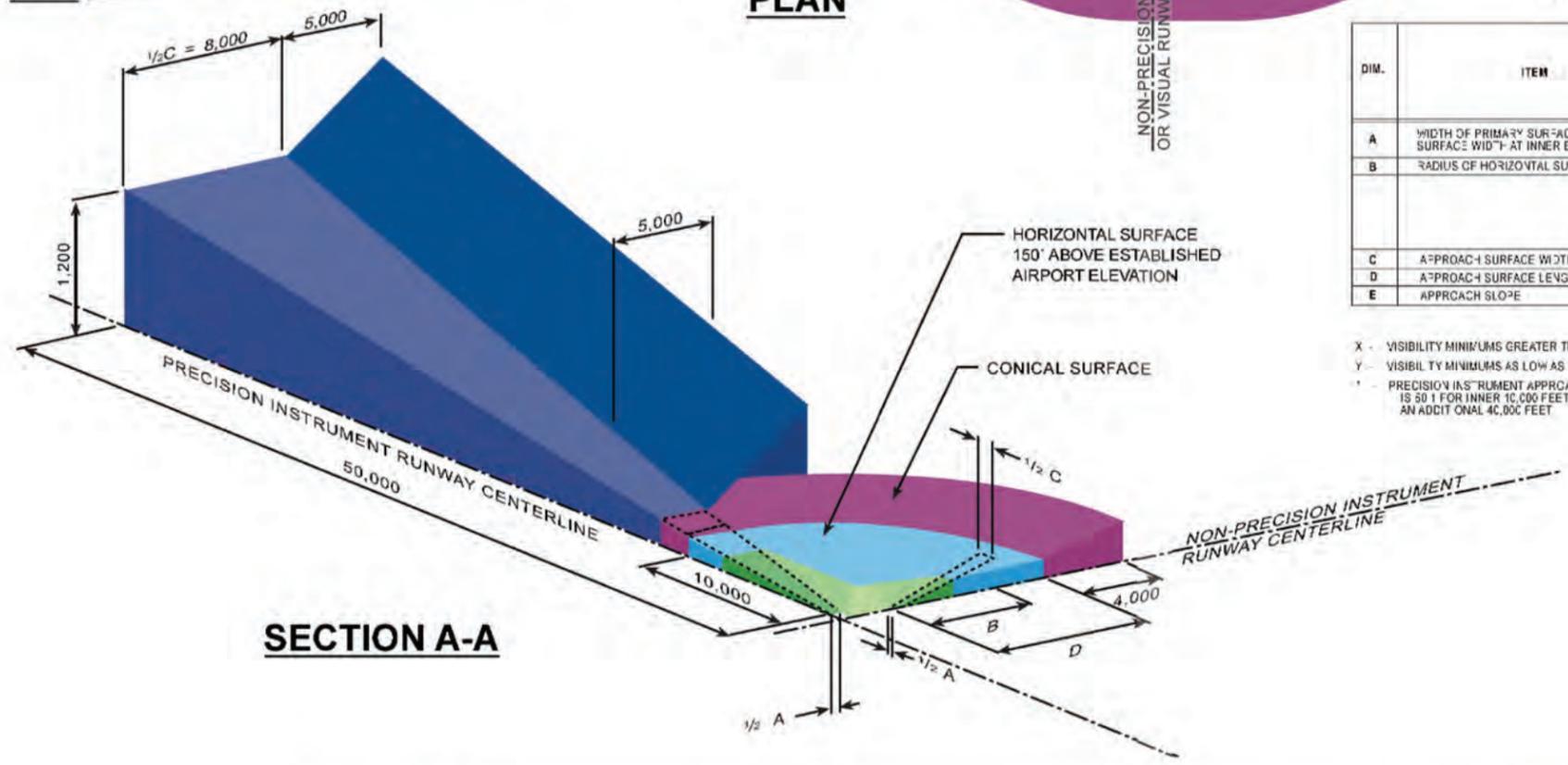


SURFACE SLOPE KEY

■	HORIZONTAL SURFACE
■	20:1
■	7:1
■	7:1
■	VARIES (SEE "E" VALUE IN TABLE BELOW)
■	40:1 (PRECISION INSTRUMENT RUNWAY ONLY)

**CIVIL AIRPORT
IMAGINARY SURFACES**

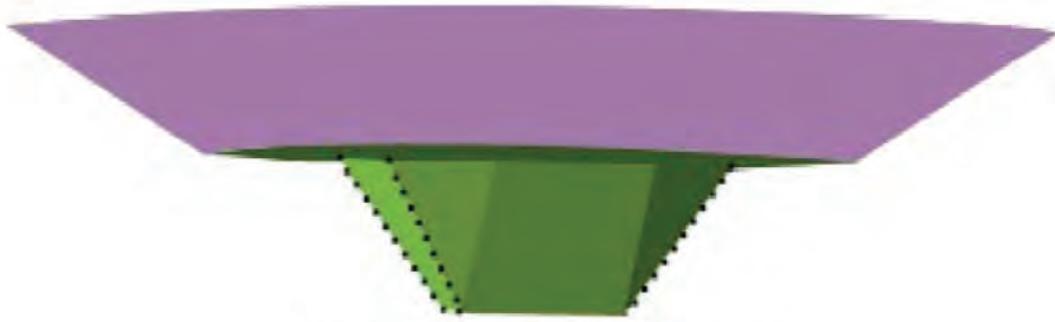
PLAN



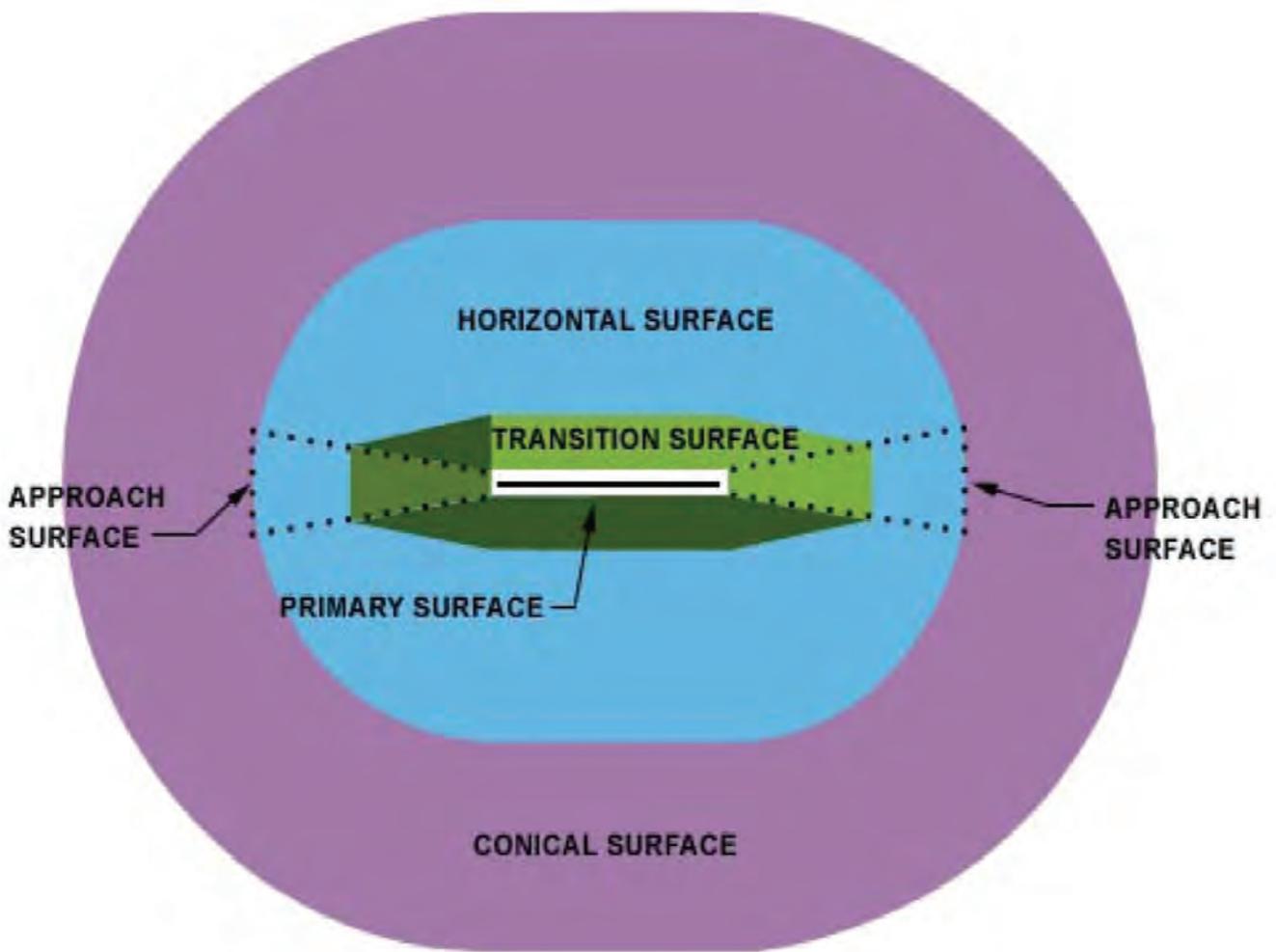
SECTION A-A

DIM.	ITEM	DIMENSIONAL STANDARDS (FEET)					
		VISUAL RUNWAY		NON-PRECISION INSTRUMENT RUNWAY		PRECISION INSTRUMENT RUNWAY	
		UTILITY	LARGER THAN UTILITY	UTILITY	LARGER THAN UTILITY		
A	WIDTH OF PRIMARY SURFACE AND APPROACH SURFACE WIDTH AT INNER END	250	500	500	X	Y	1,000
B	RADIUS OF HORIZONTAL SURFACE	5,000	5,300	5,000	10,000	10,000	10,000
		VISUAL APPROACH		NON-PRECISION INSTRUMENT APPROACH		PRECISION INSTRUMENT APPROACH	
		UTILITY	LARGER THAN UTILITY	UTILITY	LARGER THAN UTILITY		
C	APPROACH SURFACE WIDTH AT END	1,250	1,500	2,000	3,500	4,000	15,000
D	APPROACH SURFACE LENGTH	5,000	5,000	5,000	10,000	10,000	*
E	APPROACH SLOPE	20:1	20:1	20:1	34:1	34:1	*

X - VISIBILITY MINIMUMS GREATER THAN 1/4 MILE
 Y - VISIBILITY MINIMUMS AS LOW AS 1/4 MILE
 * - PRECISION INSTRUMENT APPROACH SLOPE IS 50:1 FOR INNER 10,000 FEET AND 40:1 FOR AN ADDITIONAL 40,000 FEET



PROTECTED AIRSPACE



PRIMARY SURFACE

The primary surface is a flat plane of airspace longitudinally centered on the runway and extends 200 feet beyond the runway end. The primary surface elevation is established by the elevation of the runway centerline along the length of the surface. The existing primary surface width for Runway 16/34 is 500 feet and is contained entirely within airport property. The primary surface should be free of any penetrations, except items with locations fixed by function (i.e., PAPI, runway or taxiway edge lights, etc.). The primary surface end connects to the inner portion of the runway approach surface.

The 2004 Airport Airspace Plan identified the wind cone located in the segmented circle on the east side of the runway as a primary surface penetration (23.5'). The item is identified as a frangible NAVAID with “no action” recommended.

APPROACH SURFACES

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

The 2004 Airport Airspace Plan depicts ultimate 20:1 approach surfaces for Runway 16/34 (in plan view) based on the current 3,600-foot runway length. The approach surfaces are consistent with the current runway category, approach capabilities, and approach visibility minimums. The approach surfaces extend 5,000 feet from the end of the runway primary surface. 7 tree obstructions were identified in the 20:1 runway approach surfaces (4 in Runway 16 approach and 3 in Runway 34 approach) with penetrations ranging from 6.5 to 44 feet. The recommended disposition identified on the plan for the tree obstructions is “remove.” An accompanying drawing (Runway 16/34 Protection Zone Profiles) depicts profile views for the existing and future FAR Part 77 approach surfaces and existing/future “obstruction clearance approach slopes” for the runway. The current [FAA 5010 Airport Record Form](#) identifies trees as obstructions to both runway approaches:

Runway 16: Trees; 132 feet above ground level; 1,649 feet north of Runway 16 threshold; 75 feet left; obstruction clearance of 11:1.

Runway 34: Trees; 92 feet above ground level; 1,430 feet south of Runway 34 threshold; on centerline; obstruction clearance of 13:1.

As noted in Table 4-4, an upgrade from a visual to a nonprecision instrument approach capability will change the size and slope of runway approach surfaces. The amount of penetration of items in the current 20:1 approach surfaces will increase with the flatter 34:1 nonprecision instrument approach surface. Additional obstructions may also exist based on the flatter and longer approach surface.

TRANSITIONAL SURFACE

The transitional surface is located at the outer edge of the primary surface, represented by a plane of airspace that rises perpendicularly at a slope of 7 to 1, beginning 250 feet from either side of runway centerline. The 2004 Airport Airspace Plan identified 24 tree obstructions in the runway transitional surface, with the heaviest concentration located near the south end of the runway (east side). The transitional surface penetrations ranged from 5.3 to 69.7 feet. The recommended disposition identified on the plan for the tree obstructions is “remove.”

The configuration and slope of the existing transitional surface is not affected by a future upgrade to nonprecision approach capabilities due to the existing “Larger than Utility” runway category. However, any increase in runway length will extend the transitional surface along the runway, which may capture additional obstructions.

HORIZONTAL SURFACE

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

The 2004 Airport Airspace Plan depicts a horizontal surface with 5,000-foot radii, which is consistent with visual approach capabilities for the runway. No obstructions were identified in the horizontal surface on the 2004 Airport Airspace Plan. An upgrade to nonprecision instrument capabilities will extend the radius of the horizontal surface to 10,000 feet. Topographical mapping will be examined for potential area of terrain penetration as part of the preparation of the updated FAR Part 77 Airspace Plan.

CONICAL SURFACE

The conical surface is an outer band of airspace, which abuts the horizontal surface. The conical surface begins at the elevation of the horizontal surface and extends outward 4,000 feet at a slope of 20:1.

The 2004 Airport Airspace Plan depicts a conical surface that extends from the 5,000-foot horizontal surface radii, which is consistent with visual approach capabilities for the runway. No obstructions were identified in the conical surface on the 2004 Airport Airspace Plan. An upgrade to nonprecision instrument capabilities will alter the location of the conical surface to match the 10,000-foot radius of the horizontal surface. Topographical mapping will be examined for potential area of terrain penetration as part of the preparation of the updated FAR Part 77 Airspace Plan.

Airside Requirements

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

- Runways
- Taxiways
- Airfield Instrumentation and Lighting

Runways

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

RUNWAY ORIENTATION & WIND COVERAGE

The orientation of runways for takeoff and landing operations is primarily a function of wind velocity and direction, combined with the ability of aircraft to operate under adverse wind conditions. A runway's wind coverage is measured by an aircraft's ability to operate with a "direct" crosswind, which is defined as 90 degrees to the direction of travel. For runway planning purposes, the maximum direct crosswind for small aircraft is 12 miles per hour (10.5 knots); for larger general aviation aircraft, a 15-mile per hour (13 knot) direct crosswind is used. Aircraft are able to operate safely in progressively higher wind speeds as the crosswind angle decreases and the wind direction turns more closely to the direction of flight. In addition, some aircraft are designed to safely operate with higher crosswind components. Ideally, an aircraft will take off and land directly into the wind or with light crosswind. The FAA recommends that primary runways accommodate at least 95 percent of local wind conditions; when this level of coverage is not provided, the FAA recommends development of a secondary (crosswind) runway.

As noted earlier, on-site wind data are not available at Bandon State Airport. A review of wind data from nearby Southwest Oregon Regional Airport indicated that the Runway 16/34 alignment provides approximately 95.66 percent wind coverage for small aircraft (based on a 10.5 knot crosswind component) and 97.78 percent for large aircraft. It appears that the current runway alignment provides adequate wind coverage based on the FAA's 95 percent threshold. It is recommended that an updated wind rose be prepared for Runway 16/34 when on-airport data become available through future on-site weather observation.

RUNWAY LENGTH

Runway length requirements are based primarily upon airport elevation, mean maximum daily temperature of the hottest month, runway gradient, and the critical aircraft type expected to use the runway.

The updated forecasts of aviation activity anticipate a gradual increase in business class aircraft activity during the current planning period and change in design aircraft. The activity will initially include a variety of smaller business class turboprops and jets capable of operating on the existing 3,600 foot runway in either a reduced payload or unconstrained mode. This is expected to include single- and multi-engine turboprops, light jets and conventional business jets. At sea level, these aircraft routinely operate on runways of 4,000 to 4,500 feet long (400 to 900 feet longer than the current 3,600-foot runway) when unconstrained.

For Bandon State Airport, the future design aircraft identified in the updated aviation activity forecasts is a medium size business jet (above 12,500 pounds), such as a Cessna Citation Bravo. This aircraft is representative of a segment of small/medium business jets that currently operates at the airport on a limited basis, but is constrained by facility limitations (runway length, width, pavement strength, no instrument approach, etc.). Currently, most of this type of activity is accommodated at Southwest Oregon Regional Airport in North Bend. However, local attractions, including Bandon Dunes Golf Resort, are expected to contribute to a gradually increasing share of local air traffic at Bandon State Airport during the current planning period, while continuing to rely on Southwest Oregon Regional Airport to accommodate the majority of traffic, particularly larger or high performance business jets.

As noted earlier in this chapter, the anticipated growth in single-engine turboprop activity during the planning period may be sufficient to justify an upgrade to ADG II standards before demand generated by multi-engine aircraft requiring additional runway length reaches the FAA “substantial use threshold.” Upgrading the existing runway-taxiway system to ADG II standards, particularly increasing runway width to 75 feet, may encourage increased use by multi-engine aircraft that could benefit by increased runway length.

For general aviation airport runways used by large aircraft (aircraft with maximum takeoff weights between 12,500 pounds and 60,000 pounds), the FAA recommends an evaluation based on the “family of aircraft” approach which captures the most common aircraft within a particular category. FAA Advisory Circular (AC) 150-5324-4B, Runway Length Requirements for Airport Design identifies a group of “airplanes that make up 75 percent of the fleet.” Table 4-5 summarizes representative aircraft within this “family of aircraft,” which includes the design aircraft for Bandon State Airport. The FAA indicates that the selection of the 60- or 90-percent of useful load curves is based on the haul lengths and service needs of critical design aircraft. Assuming a typical haul length of 500 miles or less, it appears that 60 percent of useful load profile for the 75 percent of the fleet is most consistent with current and forecast activity.

**TABLE 4-5: AIRPLANES THAT MAKE UP 75% OF THE FLEET
(LARGE AIRPLANES LESS THAN 60,000 POUNDS)**

- British Aerospace – Bae 124-700
- Beechcraft/Mitsubishi/Raytheon - Beechjet – 400A, Premier I
- Bombardier – Challenger 300
- Cessna – Citation I/II/III/V/VII, CJ-2, Bravo, Excel, Encore, Sovereign
- Dassault – Falcon 10, 20, 50
- Israel Aircraft Industries – Jet Commander 1121, 1123, 1124
- Learjet - 20 series, 30 series, 40, 45
- Raytheon Hawker – Hawker 400, 600
- Rockwell - Sabliner 75

Based on the FAA-recommended methodology, planning for Runway 16/34 should be consistent with the requirements of this segment of activity. It is recognized however, that the feasibility of increasing runway length at Bandon State Airport will reflect the limits of existing airport property or adjacent parcels that could be acquired through purchase. Zoning and land use regulations for adjacent parcels could also affect development feasibility, particularly for parcels that are zoned Exclusive Farm Use (EFU). The alternatives analysis will examine these issues to identify potential options for consideration. Based on current airport property ownership, it appears feasible to incrementally increase runway length without property acquisition and improve the airport’s ability to accommodate a segment of business aviation demand.

A summary of FAA recommended runway lengths for planning based on the requirements of small aircraft and large general aviation aircraft in a variety of load configurations is presented in Table 4-6. The runway length requirements for a variety of business aircraft are summarized in Table 4-7 for comparison to the output from the FAA model.

**TABLE 4-6: FAA RECOMMENDED RUNWAY LENGTHS FOR PLANNING
(FROM FAA COMPUTER MODEL)**

<p><u>Runway Length Parameters for Bandon State Airport</u></p> <ul style="list-style-type: none"> • Airport Elevation: 123 feet MSL • Mean Max Temperature in Hottest Month: 63.0 F • Maximum Difference in Runway Centerline Elevation: 17 Feet • Wet Runway • Existing Runway Length: 3,601' 	
<p><i>Small Airplanes with less than 10 seats</i></p> <p><i>75 percent of these airplanes</i></p> <p><i>95 percent of these airplanes</i></p> <p><i>100 percent of these airplanes</i></p> <p><i>Small airplanes with 10 or more seats</i></p> <p><i>Large Airplanes of 60,000 pounds or less</i></p> <p><i>75 percent of these airplanes at 60 percent useful load</i></p> <p><i>75 percent of these airplanes at 90 percent useful load</i></p> <p><i>100 percent of these airplanes at 60 percent useful load</i></p> <p><i>100 percent of these airplanes at 90 percent useful load</i></p>	<p>2,270 feet</p> <p>2,800 feet</p> <p>3,320 feet</p> <p>3,820 feet</p> <p>5,250 feet</p> <p>6,630 feet</p> <p>5,410 feet</p> <p>7,000 feet</p>

TABLE 4-7: TYPICAL BUSINESS AIRCRAFT RUNWAY REQUIREMENTS

AIRCRAFT	PASSENGERS (TYPICAL CONFIGURATION)	MAXIMUM TAKEOFF WEIGHT	RUNWAY LENGTH REQUIRED FOR TAKEOFF ¹	RUNWAY LENGTH REQUIRED FOR LANDING ²
Pilatus PC24	4	17,560	2,690	2,525
Cessna Citation Mustang	6	8,645	3,110	2,390
Cessna Citation CJ1+	4-6	10,700	3,530	2,660
Cessna Citation CJ2+	6-7	12,500	3,590	3,060
Cessna Citation CJ3	6-7	13,870	3,610	3,140
Cessna Citation CJ4	6-7	16,950	3,440	2,740
Cessna Citation Bravo	6-9	14,800	3,920	3,310
Cessna Citation Excel	7-8	20,000	3,750	3,260
Cessna Citation VII	7-8	22,450	4,950	3,000
Citation Sovereign	9-12	30,300	3,750	2,710
Cessna Citation X	8-12	36,100	5,340	3,530
Learjet 45	7-9	20,500	4,350(a)	2,660(a)
Challenger 300	8-15	37,500	4,950(a)	2,600(a)
Gulfstream 100 (Astra)	6-8	24,650	5,395(a)	2,920(a)
Gulfstream 200 (G-II)	8-10	35,450	6,080(a)	3,280(a)
Gulfstream 300 (G-III)	11-14	72,000	5,100(a)	3,190(a)
<p>1. FAR Part 25 or 23 Balanced Field Length (Distance to 35 Feet Above the Runway); Sea Level, 77 degrees F; Zero Wind, Dry Level Runway, 15 degrees flaps, except otherwise noted.</p> <p>2. Distance from 50 Feet Above the Runway; Flaps Land, Zero Wind. Dry Level Runway</p> <p>(a) For general comparison only. Manufacturer runway length data based on sea level and standard day temperature (59 degrees F) at maximum takeoff/landing weight; higher airfield temperatures will require additional runway length and/or reduction in aircraft operating weight.</p> <p>Source: Aircraft manufacturers operating data, flight planning guides.</p>				

The runway length requirements summarized in Table 4-7 confirms that a number of popular small and medium business jets are capable of operating on runways with lengths around 4,000 feet without significant operational limits in the most common local weather conditions. During higher temperatures some operational constraints may occur. Larger or more complex business jets would be limited in most conditions.

As noted earlier, the FAA establishes a “substantial use threshold” of 500 annual itinerant takeoffs and landings for the design aircraft or family of design aircraft. To pursue implementation of a planned runway extension, ODA would need to document sufficient activity (either aircraft currently using the airport that are regularly constrained by current runway length or new aircraft unable to operate at the airport due to runway length) to meet the FAA substantial use threshold.

Runway Width

Runway 16/34 is 60 feet wide, which meets the current ARC B-I dimensional standard based on approach visibility minimums of not lower than 1 mile. The future ARC B-II dimensional standard for runway width is 75 feet based on the same approach visibility criteria.

Airfield Pavement

As noted in Chapter Two, the airfield pavement at Bandon State Airport is designed to accommodate small aircraft and has a pavement strength rating of 12,000 pounds for aircraft equipped with single-wheel landing gear. Based on the future design aircraft, the weight bearing capacity of the runway, major taxiways and portions of the aircraft parking apron pavement should be increased to 30,000 pounds (single wheel) to accommodate typical business class aircraft.

A regular program of periodic maintenance is required to maximize the useful life of the pavement, including vegetation control, crack filling and fog/slurry seals.

In Chapter Two (Table 2-8), the pavement conditions at the airport from the past three inspections were summarized. Table 4-8 shows the current and predicted pavement conditions for current pavement sections from the 2013 pavement plan, assuming no maintenance is performed. Some of the sections of pavement inspected are off airport property (privately owned) and not eligible for FAA funding.

TABLE 4-8: FORECAST PAVEMENT CONDITION INDICES

PAVEMENT SECTION	2013 PCI ¹	2018 PCI ¹	2023 PCI ¹	CURRENT CONDITION
Runway	98	95	91	Good (Crack Seal in 2011)
Parallel Taxiway (North Section, AC Hold Area, North Exit Taxiway)	100	84	72	Good (Crack Seal in 2011)
Parallel Taxiway (Middle Section)	77	71	66	Satisfactory (Crack Seal in 2011)
Parallel Taxiway (South Section, AC Hold Area, South Exit Taxiway)	99	83	71	Satisfactory (Crack Seal in 2011)
Center Exit Taxiway	98	82	71	Good (Slurry Seal in 2003)
North Access Taxiway	81	75	70	Satisfactory (Crack Seal in 2011)
Taxiway Connection (SE corner of main apron) to Parallel Taxiway	87	81	76	Good (Crack Seal in 2011)
North Section of Main Apron	86	75	63	Good (Crack Seal in 2011)
South Section of Main Apron	85	79	74	Satisfactory (Crack Seal in 2011)
Main Apron (west edge of apron; hangar/FBO access)	40	39	37	Very Poor (Slurry Seal in 2006)
Taxilane for adjacent T-hangar (NW corner of main apron) - <i>Off Airport</i>	39	38	36	Very Poor
Taxilane for Private Hangar - <i>Off Airport</i>	77	68	62	Satisfactory

1. The Pavement Condition Index (PCI) scale ranges from 0 to 100, with seven general condition categories ranging from “failed” to “good.” For additional details, see *Oregon Aviation System Plan Pavement Evaluation/Maintenance Management Program* (2014) for Bandon State Airport.

Taxiways

Taxiways are constructed primarily to facilitate aircraft movements to and from the runway system. Some taxiways are necessary simply to provide access between apron and runways, while other taxiways become necessary as activity increases and safer and more efficient use of the airfield is needed. The existing taxiway system at Bandon State Airport provides aircraft access to the runway and all landside facilities.

PARALLEL TAXIWAY AND EXIT TAXIWAYS

As noted earlier, the parallel taxiway and exit taxiways meet all B-I standards, taxiway access is provided to the full runway and aircraft hold areas are provide at both ends of the runway. A parallel taxiway extension is recommended in conjunction with any future runway extension.

Application of the future ADG II standard will require significant changes to the existing taxiway including widening (35 feet) and an increase in runway separation (240 feet). The existing aircraft hold areas will also require modification/replacement to meet ADG II standards.

TAXILANES

The main apron is configured with a primary access taxiway that travels through the apron and three stub taxilanes that serve four rows of aircraft tiedowns. The apron is connected to the parallel taxiway by a short access taxiway (35 feet wide) at the south end and a long access taxilane (25 feet wide) at the north end. Several off-airport hangars are accessed from a connecting taxilane that extends south of the main apron.

The configuration of aircraft tiedowns and adjacent taxilanes on the main apron was identified earlier as nonstandard for taxilane object free area. Although the small tiedown anchors are installed along the edges of the 79-foot taxilane OFA in the northern rows, portions of aircraft parked in these positions extend into the OFA. The FAA clearing standard for taxilane OFAs is measured as the distance from taxilane centerline to a fixed or movable object (parked aircraft). The southern aircraft tiedown positions used by larger aircraft have similar clearance issues. The configuration of the existing parking on the main apron will be examined in the alternatives analysis in conjunction with evaluating future parking requirements.

The ADG I taxilane OFA width standard is 79 feet (39.5 feet from centerline); the ADG II width standard is 115 feet (57.5 feet from centerline). The main access taxilanes and taxilanes used to access business aircraft parking located within the main aircraft apron should be configured to accommodate ADG II aircraft. Taxilanes used to access small airplane tiedowns are typically designed to accommodate ADG I aircraft.

Airfield Instrumentation, Lighting and Marking

NAVIGATIONAL AIDS

There are no navigational aids (NAVAID) at Bandon State Airport. The nearest NAVAID is the Very High Frequency Omnidirectional Range (VOR) for Southwest Oregon Regional Airport (North Bend VORTAC) approximately 21 NM north.

Future instrument approach capabilities would be provided by GPS-based systems that do not require ground-based navigational aids. The FAA NextGen program is currently being implemented which represents the evolution from the ground-based system of air traffic control to a satellite-based system. The integration of NextGen technology with satellite based instrument approach capabilities is expected to allow small airports to access instrument flight capabilities with minimal onsite facility investment.

AIRFIELD LIGHTING AND SIGNAGE

The lighting systems associated with the runway include Medium Intensity Runway Lighting (MIRL), Runway End Identifier Lights (REIL) and Precision Approach Path Indicators (PAPI). Other airfield lighting includes the rotating beacon and lighted wind cone. All lighting systems are reported to operate normally and are in good condition. However, replacement of these items should be anticipated during the planning period based on typical useful life of the systems and the local coastal marine climate.

The Runway 16 PAPI is currently out of service indefinitely due to obstructions (trees) that are interfering with the glide path. It appears that the PAPI can be activated once the glide path is cleared of obstructions.

The parallel taxiway and exit taxiways are equipped with edge reflectors that require periodic replacement. The addition of taxiway edge lighting may be considered in the future depending on the level of night operations, although edge reflectors are generally adequate and economical.

It is anticipated that existing airfield signage on the airport will need to be replaced or upgraded during the planning period.

RUNWAY MARKINGS

Both ends of Runway 16/34 have non-precision instrument (NPI) markings which include designation numbers, centerline stripe and threshold bars indicating the end of usable runway. The blast pads located at each end of the runway are marked with yellow chevrons. These markings currently exceed standards for a visual runway and meet standards for the future A/B-II non-precision instrument runway. Any future runway extension(s) will require new non-precision instrument markings to accommodate instrument approach capabilities to that runway end.

On Field Weather Data

Bandon State Airport does not have on-site weather observation capabilities such as an automated weather observation system (AWOS) or automated surface observation system (ASOS). The nearest airport weather is available at Southwest Oregon Regional Airport in North Bend, 21 miles north-northeast. The 2004 Airport Layout Plan identified an ASOS as a high priority (2005) project in the airport's 20-year capital improvement program (CIP). The availability of on-site weather data at Bandon will benefit both local and regional visual flight rules (VFR) activity and also support future instrument approach capabilities.

Landside Facilities

For general aviation airports, landside facilities are generally defined as those that serve aircraft, passenger needs and their related functions. At Bandon State Airport, landside facilities include aircraft aprons, hangars, fixed base operator (FBO), and aircraft fueling facilities.

AIRCRAFT PARKING AND TIEDOWN APRON

Aircraft aprons provide parking for both locally based aircraft that are not stored in hangars and for transient aircraft visiting the airport. Bandon State Airport has a single main apron (approximately 14,666 square yards) configured with 21 aircraft parking positions in four rows. The apron has 13 small aircraft tiedowns and 8 tiedowns for larger airplanes.

As noted earlier, the current configuration of the main apron taxilanes and adjacent aircraft parking areas does not fully conform to FAA taxilane object free area standards. Options for addressing the apron configuration and the current and future (ADG I and ADG II) FAA standards will be evaluated in the alternatives analysis, in addition to planning for future demand and fleet mix.

For planning purposes, it is assumed that 10 percent of current and forecast based aircraft will utilize apron parking and 90% will utilize hangar storage. While the percentage of hangared based aircraft may occasionally be close to 100 percent, this planning metric reflects the potential to attract and accommodate based aircraft when hangar space is unavailable.

As indicated in the aviation activity forecasts, the number of based aircraft at Bandon State Airport is projected to increase from 37 to 50 during the twenty-year planning period. Assuming 10 percent of based aircraft will require apron parking demand for locally based aircraft tiedowns will range from 4 to 5 during the twenty year planning period. The FAA planning criterion of 300 square yards per based aircraft was used to determine future itinerant ramp requirements for small airplane parking.

FAA AC 150/5300-13 suggests a methodology by which itinerant parking requirements can be determined from knowledge of busy day operations (takeoffs and landings).² Based on seasonal travel demand and the remoteness of the area, it is assumed that a relatively high percentage of busy day (the average day in the peak month) aircraft will need to be accommodated simultaneously. For planning purposes, future demand for itinerant parking spaces was estimated based on 50 percent of design day itinerant operations (50% of design day itinerant operations divided by two, to identify peak parking demand). Itinerant aircraft parking requirements are estimated to range from 6 to 10 during the twenty year planning period and will include a variety of aircraft types. The FAA planning criterion of 360 square yards per itinerant (small) aircraft was used to determine future itinerant ramp requirements. Larger space allocations are used to determine parking requirements for multi-engine or business class aircraft and helicopters. Projected aircraft parking requirements are summarized in Table 4-9.

It is recognized that forecast growth in based and transient aircraft activity is modest and could be exceeded if conditions are favorable. Individual aircraft owner needs vary and demand can be influenced by a wide range of factors beyond the control of an airport. Based on the potential for higher demand, it is recommended that a development reserve equal to 100 percent of forecast demand be used in future apron planning.

OTHER DESIGN CONSIDERATIONS

When evaluating apron requirements, it is important to note that approximately 71 percent of the current apron area is configured with taxilanes and the associated object free areas. These areas used for

² Busy Day Operations is defined as the average number of daily operations during the peak month (peak month operations divided by 30 days).

aircraft movement and are not available to accommodate aircraft parking or fueling. As noted earlier, the current apron configuration does not fully meet FAA taxilane OFA clearance standards for ADG I aircraft. In addition, the future ADG II design aircraft will require increased taxilane OFA setbacks for the main access taxilanes and adjacent to large aircraft parking positions. The need to increase clearances between parked aircraft and adjacent taxilanes will require changes to the existing apron configuration, which may result in a loss of existing parking capacity or potentially require apron expansion/reconfiguration to meet standards. Other design considerations include the need to provide a dedicated aircraft fueling area that is clear of adjacent taxilane OFAs and aircraft parking positions, and helicopter parking that provides adequate separation from fixed wing aircraft parking to minimize rotor wash damage.

AIRCRAFT HANGARS

Bandon State Airport accommodates a variety of hangars including commercial hangars and hangars used primarily for aircraft storage (conventional hangars and T-hangars). It is estimated that 90 percent of the airport's based aircraft are stored in hangars. For planning purposes, it is assumed that existing hangar space is committed and all additional (forecast) demand would need to be met through new construction.

As indicated in the aviation activity forecasts, the number of based aircraft at Bandon State Airport is projected to increase by 13 aircraft during the twenty year planning period. Based on a projected 90 percent hangar utilization level, additional demand for new hangar space is estimated to be 12 spaces (approximately 18,000 square feet). A planning standard of 1,500 square feet per based aircraft stored in hangars is used to project gross space requirements. The projected hangar requirements for aircraft storage at Bandon State Airport are presented in Table 4-9.

Individual aircraft owners needs vary and demand can be influenced by a wide range of factors beyond the control of an airport. In addition, the moderate forecast growth in based aircraft may be exceeded if conditions are favorable. For this reason, it is recommended that hangar development reserves be identified to address the uncertainty of hangar market conditions and demand factors. Conservative development reserves should be established to accommodate a combination of conventional hangars and T-hangars, roughly equal to 50 to 100 percent of the twenty year forecast (net) demand. The location and configuration of the development reserves will be addressed in the alternatives analysis.

In addition to aircraft storage, additional demand for business related and commercial hangar needs may be required. Specialized aviation service businesses such as fixed base operators (FBO), engine & airframe repair, etc. generally prefer locations that provide convenient aircraft access and public access. While there is no specific formula to predict demand for general aviation service businesses at a particular airport, reserving space for larger commercial hangars is recommended.

TABLE 4-9: APRON AND HANGAR FACILITY REQUIREMENTS SUMMARY

ITEM	BASE YEAR 2014	2019	2024	2029	2034
Based Aircraft Forecast	37	40	43	46	50
Aircraft Parking Apron <i>(Note: capacities reflect current configuration of existing public use apron areas, actual capacity when reconfigured may be different.)</i>					
Small Aircraft Tiedowns (SE/ME)	13				
Large Aircraft Tiedowns (ME/TP)	8				
Small Helicopter Parking Spaces	0*				
Total Designated Parking Spaces Available	21				
Total Apron Area <i>(main apron area including taxilanes)</i>	14,666 SY (Apprx.)				
Projected Needs (Gross Demand) ¹					
Transient Small Airplane Tiedowns (@ 360 SY each)		3 1,080 SY	3 1,080 SY	3 1,080 SY	4 1,440 SY
Locally-Based Tiedowns (@ 300 SY each)		4 1,200 SY	4 1,200 SY	5 1,500 SY	5 1,500 SY
Transient Business Aircraft Parking Positions (@ 625 SY each)		2 1,250 SY	3 1,875 SY	4 2,500 SY	5 3,125 SY
Transient Small Helicopter Parking Positions (@ 380 SY each)		1 380 SY	1 380 SY	1 380 SY	1 380 SY
Total Apron Needs (Aircraft Parking)		10 3,910 SY	11 4,535 SY	13 5,460 SY	15 6,445 SY
Aircraft Hangars					
Existing Hangar Spaces T-Hangar Conventional Hangar	22 9-18 ³				
(New) Hangar Demand ² (@ 1,500 sf per space) <i>(Cumulative twenty year projected demand 12 spaces / 18,000 sf)</i>		3 spaces/ 4,500 sf	3 spaces/ 4,500 sf	3 spaces/ 4,500 sf	3 spaces/ 4,500 sf
<p>* These aircraft are accommodated on the main apron (open areas)</p> <ol style="list-style-type: none"> 1. Aircraft parking demand levels identified for each forecast year represent total gross demand 2. Hangar demand levels current hangar capacity (assume 1,500 sf per space) 3. Conventional hangars may accommodate multiple aircraft (assumed capacity 1 to 2 aircraft per hangar) 					

AIRCRAFT WASH DOWN FACILITIES

Wash down facilities are recommended to accommodate general aviation aircraft with a catch basin and hard piping to divert wash residue into a sanitary sewer or stormwater treatment system. Wash facilities are typically sized to accommodate one aircraft on a pad approximately 50 feet by 50 feet. The wash pad may be located adjacent to existing parking apron or hangars; close access to utility systems is a key siting factor.

SURFACE ACCESS AND VEHICLE PARKING

Access to Bandon State Airport is provided by Kehl Road, which enters the west side of the airport near midfield, directly from U.S. Route 101. The current public access to the airport appears to be adequate, although it currently terminates on privately owned land (gravel parking lot) abutting the west side of the airport. Public or tenant access to the aircraft parking apron and existing hangars is limited and requires driving on taxilanes or taxiways. An undeveloped landside area in the northwest section of the airport is not currently served with vehicle access. Upgrades to the existing vehicle access within the west landside areas should be evaluated as part of the alternatives analysis when considering future development options.

The existing vehicle parking lot is located off airport property on the west side of the buildings located along the west side of the main apron. Vehicle parking on the airport is limited to areas adjacent to hangars located north of the main apron. Vehicles routinely park along the west edge of the main apron, partly within the main access taxilane OFA. Options for relocating this activity out of the taxilane OFA should be considered in the alternatives analysis.

AGRICULTURAL AIRCRAFT FACILITIES

There are currently no aerial applicator loading or containment facilities at Bandon State Airport and no known demand for facilities.

Support Facilities

AVIATION FUEL STORAGE

A 12,000 gallon above ground double wall storage tank with 100LL (AVGAS) including a dispensing facility were installed near the south end of the main apron in 2009. Frank's Flight Service is responsible for dispensing this fuel, and the tanks are owned by Bandon Aero Club.

Based on the projected increase in turbine aircraft activity at the airport, terminal area planning should include adequate space to accommodate a second tank for jet fuel (Jet A). With the future of 100LL aviation gasoline uncertain at this time, demand for additional fuel grades, including automobile gasoline and the eventual 100LL replacement may require multiple tanks. Local market conditions normally dictate decisions on private investment in aircraft fuel storage.

GENERAL AVIATION TERMINAL/FIXED BASE OPERATOR BUILDING

Existing facilities consist of the Bandon Aero Club building located adjacent to the main apron. The building includes public restrooms, telephone and meeting areas. The forecast growth in transient business aircraft activity at the airport is expected to generate increased demand for transient passenger services, public access and vehicle parking. Future demand for additional fixed base operator (FBO) facilities or a general aviation terminal should be considered in the terminal area planning.

UTILITIES

The airport's landside facilities are located on the west side of the runway, which is served by electricity, water and telephone services located along the Highway 101 corridor. The City of Bandon provides sanitary sewer and waste water treatment plan services within Bandon's city limits and urban growth area, although the airport is not currently connected to City services. Buildings on the airport are served by individual septic systems. Water on the airport is provided by the City of Bandon through local wells.

Extension of City water and sewer service to the airport is recommended to support current and future development needs. Electricity for the airport is supplied by Bandon Power. New electrical service on the airport should be placed underground where feasible to reduce overhead hazards to aircraft operation. Natural gas is not currently available in Bandon but may be provided in the future. Extending natural gas service to the airport is recommended to support future development.

Security

The airport currently has wire fencing located along portions of its property line. Although fencing is not required at general aviation airports such as Bandon State, it is recommended that the airport installs new fencing to increase security and to protect the airfield from wildlife concerns. Typical airport fencing consists of six to eight feet high chain link with three strand barbed wire. Flood lighting is recommended in aircraft fueling locations, aircraft parking and hangar areas. The use of full or partial cutoff light fixtures is recommended for all exterior lighting on airports to limit upward glare.

Facility Requirements Summary

The projected twenty year facility needs for Bandon State Airport are summarized in Table 4-10. As noted in the table, maintaining existing pavements represents a significant, ongoing facility need. The updated forecast of aviation activity anticipates growth activity that will generate airside and landside facility demands beyond existing capabilities. The anticipated change from airplane design group I to II during the planning period will require significant upgrades to the existing runway-taxiway system. Existing terminal area facilities will require reconfiguration and/or expansion to accommodate forecast activity and the change in design aircraft. Demand for new or expanded facilities, such as aircraft hangars, will be market driven. However, significant improvements in surface access, utility extensions, site preparation and taxiway construction will be required to facilitate new development on the west side of the airfield.

TABLE 4-10: FACILITY REQUIREMENTS SUMMARY

ITEM	SHORT TERM	LONG TERM
Runway 16/34	Pavement maintenance	Pavement maintenance Overlay existing runway AGIS Survey Runway Extension (approximately 400 feet or based on specific design aircraft) Increase pavement strength to 30,000 pounds single wheel Upgrade runway to ADG II standards <ul style="list-style-type: none"> • Widen to 75 feet Expand OFA, OFZ and RSA
Taxiways	Pavement maintenance Replace Edge Reflectors	Pavement maintenance Increase pavement strength to 30,000 pounds single wheel Install taxiway edge lighting Upgrade parallel taxiway to ADG II standards <ul style="list-style-type: none"> • Increase runway separation to 240 feet • Widen to 35 feet • Expand TSA, OFA
Hangar/Access Taxilanes	Pavement maintenance Reconfigure main apron taxilanes to meet ADG II/I OFA standards Evaluate off-airport pavement maintenance	Pavement maintenance Taxilane access to new hangar sites
Aircraft Apron	Pavement maintenance Reconfigure main apron tiedowns, large aircraft parking and fuel area to meet taxilane OFA clearance standards	Pavement maintenance Overlay main apron Apron expansion /reserve
Hangars	Define development areas for T-hangars, Conventional Hangars and Commercial Hangars.	Hangar development reserves
Navigational Aids and Lighting	Reactivate Runway 16 PAPI (obstruction removal) Instrument approach development and obstruction/AGIS survey	Replace MIREL, REiL and PAPI (at end of useful life) Install AWOS
Fuel Storage	Define fueling area (clear of taxilane OFA clear areas) Provide space for additional fuel tanks/grades	Develop mobile fuel parking/containment area (as fuel trucks are used at airport)
FBO	Address vehicle parking and access	General aviation terminal (reserve) FBO facilities expansion (reserve)
Utilities	Identify areas and utilities needed to support future development.	Same
Roadways & Vehicle Parking	Evaluate public access requirements to terminal area and other landside facilities. Extend roads to new development areas. Add vehicle parking area in existing and future hangar areas. Pave primary parking area adjacent to main apron and FBO.	Same
Security	Identify fencing, access gates and lighting needs and locations.	Install new perimeter fencing and automated gates for landside areas. Install flood lighting in hangar and apron areas.

Note: Vegetation control, crackfill, sealcoat, slurry seal, localized patching, joint rehabilitation, etc., as required.

Airfield Capacity

Annual service volume (ASV) is a measure of estimated airport capacity and delay used for long-term planning. ASV, as defined in [FAA Advisory Circular \(AC\) 150/5060-5, Airport Capacity and Delay](#), provides a reasonable estimate of an airport's operational capacity. The ratio between demand and capacity helps to define a timeline to address potential runway capacity constraints before they reach a critical point. If average delay becomes excessive (greater than 3 minutes per aircraft), significant congestion can occur on a regular basis, which significantly reduces the efficient movement of air traffic. ASV is calculated based on the runway and taxiway configuration, percent of VFR/IFR traffic, aircraft mix, lighting, instrumentation, the availability of terminal radar coverage and the level of air traffic control at an airport.

The 2004 ALP Report did not analyze annual airfield capacity. However, for long-term planning purposes, the FAA estimates annual capacity (ASV) for a single runway with no air carrier traffic is approximately 230,000 operations; hourly capacity is estimated to be 98 operations during visual flight rules (VFR) conditions and 59 operations during instrument flight rules (IFR) conditions. Although these estimates assume optimal conditions (air traffic control, etc.), they provide a reasonable basis for approximating existing and future capacity:

Existing Capacity: 11,100 Annual Operations / 230,000 ASV = 4.8% (demand/capacity ratio)

Future Capacity: 20,000 Annual Operations / 230,000 ASV = 8.7% (demand/capacity ratio)

Based on these ratios, the average delay per aircraft would be expected to remain below one minute through the planning period. The FAA recommends that airports proceed with planning to provide additional capacity when 60 percent of ASV is reached. As indicated in the updated aviation activity forecasts, peak hour activity is projected to remain well below the 60 percent threshold during the planning period.

Chapter 5 – Airport Development Alternatives



Chapter 5 – Airport Development Alternatives

The evaluation of future development options represents a critical step in the airport planning process. The primary goal is to define a path for future development that provides an efficient use of resources and is capable of accommodating the forecast demand and facility needs defined in the master plan.



Introduction

As noted in the facility requirements evaluation, current and long term planning for Bandon State Airport is based on maintaining and improving the airport's ability to serve a wide range of general aviation and business aviation aircraft. The alternatives will address current and future facility demand and FAA airport design requirements. All proposed facility improvements are consistent with applicable FAA airport design standards and FAR Part 77 airspace planning standards.

Evaluation Process

Creating preliminary alternatives represents the first step in a multi-step process that leads to the selection of a preferred alternative. It is important to note that the current FAA-approved airport layout plan (ALP) identifies future improvements recommended in the last master planning process. The master plan update provides a fresh look at addressing facility needs, but also allows the components of the previous preferred alternative to be retained or modified, if they meet current needs.

The preliminary airside improvements will be evaluated by the Master Planning Advisory committee and ODA staff, with input provided by FAA, to identify a preferred development alternative that can be combined with the preferred landside development alternative. The process will allow the widest range of

ideas to be considered and the most effective facility development concept to be defined. From this evaluation process, elements of a preferred alternative will emerge that can best accommodate all required facility improvements.

The Consultant will integrate these items into a draft preferred alternative that will be reviewed and refined as ODA proceeds through the process of selecting a final preferred development alternative for Bandon State Airport. Throughout this process, public input will also help to shape the preferred alternative.

Once the preferred alternative is selected by ODA, a detailed capital improvement program will be created that identifies and prioritizes specific projects to be implemented. The elements of the preferred alternative will be integrated into the updated airport layout plan (ALP) drawings that will be used to guide future improvements at the airport.

The FAA generally recommends that airport master plans be developed in an “unconstrained” manner when initially defining future demand and related facility improvements, rather than establishing pre-defined limits that drive the planning process. In reality, most airports face some practical limit on facility development within their boundaries or on readily developable adjacent lands. There is often very limited value in exploring major expansion scenarios involving significant cost and impacts on a community, except in rare cases where the overall economic value of the expansion provides a clear public benefit.

In this case, the ability to expand the footprint of Bandon State Airport significantly beyond its current boundaries is sufficiently uncertain to support a measured or “semi-constrained” approach. Recognizing these factors, the proposed preliminary airside physical improvements for Bandon State Airport will be limited to areas within existing airport property. Longer term options that may require property acquisition will be presented as “development reserves.”

No-Action Alternative

In addition to proactive options that are designed to respond to future facility needs defined in the previous chapter, a “no-action” option also exists, in which ODA may choose to maintain existing facilities and capabilities without investing in facility upgrades or expansion to address future demand. The existing airfield configuration would remain unchanged from its present configuration and the airport would essentially be operated in a “maintenance-only” mode.

The primary result of this alternative would be the inability of the airport to accommodate aviation demand beyond current facility capabilities. Future aviation activity would eventually be constrained by the capacity, safety, and operational limits of the existing airport facilities.

The no-action alternative establishes a baseline from which the action alternatives can be developed and compared. The purpose and need for the action alternatives is defined by the findings of the forecasts and

facilities requirements analyses. Forecast aviation activity and the factors associated with increased activity (potential for congestion, safety, etc.) are the underlying rationale for making facility improvements. Market factors (demand) effectively determine the level and pace of private investment (hangar construction, business relocation to the airport, etc.) at an airport. Public investment in facilities is driven by safety, capacity, and the ability to operate an airport on a financially sustainable basis.

Based on the factors noted above, the no-action alternative is inconsistent with the management and development policies of Oregon Department of Aviation and its long-established commitment to provide safe and efficient public air transportation facilities (state-owned airports) that are socially, environmentally, and economically sustainable.

Preliminary Development Alternatives

The facility needs identified in the previous chapter include a variety of airside (runway-taxiway) and landside needs (aircraft parking, hangars, fueling, support facilities, etc.). Items such as fencing, lighting improvements, minor roadway extensions and pavement maintenance do not typically require an alternatives analysis and will be incorporated into the preferred development alternative.

The preliminary alternatives are organized by type of facilities (airside and landside) and are intended to facilitate a discussion and evaluation about the most efficient way to meet the facility needs of the airport. The preliminary development alternatives are described below with graphic depictions (**Figures 5-1 through 5-3**) provided to illustrate the key elements of each alternative. A new section for this chapter will be added to reflect the refined/preferred development alternatives once the evaluation of preliminary alternatives is completed.

It is important to note that the eventual preferred alternative selected by ODA may come from one of the preliminary alternatives, a combination or hybrid of the preliminary alternatives, or a new concept that evolves through the evaluation and discussion of the preliminary alternatives. As noted earlier, ODA also has the option of limiting future facility improvements based on financial considerations or development limitations.

Airside Development Options (Runway-Taxiway Improvements)

The main components of the airside development options are related to the upgrade from Airplane Design Group I (ADG I) to Airplane Design Group II (ADG II) identified in the previous chapters (Aviation Activity Forecasts -Chapter 3; Facility Requirements Analysis - Chapter 4).

The planned upgrade in design standards reflects the anticipation of continued growth in activity generated by ADG II aircraft, including single engine turboprops (Cessna Caravan, Pilatus PC-12, etc.), multi-engine turboprops (Beechcraft King Air, etc.), and small or medium business jets (Cessna 500-series Citations, etc.)

that are both physically capable of operating on the runway length available at Bandon State Airport, and willing to operate at a smaller airport with fewer facilities or amenities such as an air traffic control tower, precision instrument approach, and a range of services that cater to business aviation.

The 2004 ALP identifies a multi-engine turboprop (Airport Reference Code (ARC): B-I) as the current and future design aircraft for Runway 16/34. The updated aviation activity forecast (Chapter 3) maintains the ARC B-I multi-engine turboprop as the current design aircraft, but anticipates growth in ADG II turboprop and business jet activity during the current planning period, sufficient to justify a future upgrade from ADG I to ADG II.

RUNWAY

The runway length analysis presented in the previous chapter addressed a range of practical aircraft operational issues and site characteristics associated with Bandon State Airport that suggest feasibility exists to accommodate an incremental increase in business aviation activity that can be achieved through limited facility expansion. The need for additional length on Runway 16/34 was noted in the both the forecast and facility requirements analyses and is required to improve safety for multi-engine aircraft, particularly during wet runway conditions.

The forecast level of multi-engine turbine aircraft operations is projected to meet the FAA's substantial use threshold criteria (as design aircraft) by mid-way in the current 20-year planning period. This activity is in addition to current and forecast multi-engine piston aircraft operations which have similar runway length requirements. The forecasts also project sufficient levels of ADG II aircraft operations to support a change in airplane design group (ADG I to ADG II) by mid-way through the planning period.

AIRCRAFT PERFORMANCE CHARACTERISTICS

As noted above, the general aviation turbine aircraft fleet now reflects the increased popularity aircraft capable of operating on relatively short runways (4,000 feet or less). These include single engine turboprops and several small and medium business jets included in ADG I and II, with runway length requirements comparable to light piston twin-engine (ADG I) piston aircraft.

For planning purposes, the runway length requirements of a typical multi-engine piston (ADG I) or small multi-engine turboprop aircraft provides a reasonable indication of need, as activity transitions into increased ADG II multi-engine turbine aircraft activity.

The existing runway length (3,601 feet) is adequate for single engine aircraft operations in most conditions and can accommodate multi-engine piston aircraft under favorable conditions. However, multi-engine

aircraft takeoffs are often constrained by available runway length during warm temperatures, when operating near maximum takeoff weight, or when the runway surface is wet.

Multi-Engine Aircraft Performance Characteristics: Accelerate-Stop Distance

For most multi-engine aircraft, pilots are trained that if an engine fails before attaining liftoff speed, the only proper action is to discontinue the takeoff. If the engine fails after liftoff with the landing gear still down, the takeoff should be discontinued if touch-down and roll-out on the remaining runway is still possible. Continuing a takeoff on one engine is only recommended when other options are not available since multi-engine piston aircraft typically lose 80 to 90 percent of their climb performance when operating on one engine. The “accelerate-stop distance” is the distance required for an aircraft to accelerate to liftoff speed and, assuming failure of an engine at the instant liftoff speed is reached, throttle to idle, apply maximum braking and stop. Aircraft manufacturers assume that the pilot will recognize the engine failure within 3 seconds and act decisively.

The importance of having the longer of the accelerate-stop distances for multi-engine aircraft operations is emphasized in the [FAA Handbook 8083.3A – Transitioning to Multi Engine Airplanes](#). As noted in the handbook *“Once the decision to reject a takeoff is made (when an engine failure occurs before liftoff), the pilot should promptly close both throttles and maintain directional control with the rudder, nose wheel steering, and brakes. Aggressive use of rudder nose wheel steering, and brakes may be required to keep the aircraft on the runway. Particularly, if an engine failure is not immediately recognized and accompanied by prompt closure of both throttles. However, the primary objective is not necessarily to stop the airplane in the shortest distance, but to maintain control of the airplane as it decelerates. In some situations, it may be preferable to continue into the overrun area under control rather than to risk directional control loss, landing gear collapse, or tire/brake failure in an attempt to stop the airplane in the shortest possible distance.”*

Typical Piston Twin (Beechcraft Baron 58P)

The accelerated-stop distance for a typical multi-engine piston aircraft (Beechcraft Baron 58P, ARC B-I) was reviewed for Bandon State Airport to illustrate common runway length requirements for a variety of similar aircraft. At maximum gross takeoff weight on a typical summer day, the Baron 58P requires approximately 3,600 feet for the accelerate-stop distance on a dry runway surface, no wind, and with optimal pilot performance (recognizing engine failure and responding within 3 seconds). This distance could be expected to increase by up to 15 percent (to approximately 4,140 feet) on a wet runway when braking action and directional control of the aircraft is reduced due to hydroplaning. The required distances may be reduced when aircraft are operated at lower weights or when weather conditions are more favorable (lower temperature, headwind, etc.), although the distances required on wet runways will always be greater than dry runways for any specific atmospheric condition.

The manufacturer indicates that at 81 knots just before takeoff, upon engine failure, the aircraft will travel approximately 410 feet in the 3 seconds before the pilot cuts power on the good engine and begins to apply maximum braking. At this point, the ability to safely bring the aircraft to a stop on the runway remaining is determined by runway surface condition, pilot skill and avoiding serious mechanical failures (e.g., tire blow outs, brake failure, landing gear collapse, etc.). The presence of a standard safety area along the sides and beyond the ends of the runway provides an additional margin of safety intended to minimize serious aircraft damage and loss of life when aircraft depart the runway surface in an uncontrolled condition.

Typical Multi-Engine Turboprop (Beechcraft King Air 350)

To illustrate the requirements of typical multi-engine turboprop, the takeoff distance for a King Air 350 was reviewed for conditions similar to Bandon. At sea level and 15 degrees Celsius (59° Fahrenheit) the King Air 350 requires 4,193 feet for takeoff at maximum gross takeoff weight (15,500#). This distance reflects the longest of the engine failure scenarios (accelerate-stop and accelerate-go) and a normal two-engine takeoff on a dry runway, as required for aircraft certified under FAR Part 23. The manufacturer does not specify a corresponding runway length required for a wet runway, but the 15 percent increase noted above for the piston twin-engine aircraft is comparable to the “wet runway factor” provided by other manufacturers of turbine aircraft. When applied to the King Air 350, the approximate wet runway takeoff distance would increase to 4,822 feet.

Aircraft Performance Summary

The aircraft performance data suggest that a typical twin-engine piston aircraft is capable of operating on Runway 16/34 during dry conditions with an acceptable level of safety, but is constrained when the runway surface is wet. Similar operational constraints exist for multi-engine turbine aircraft. The coastal location of Bandon State Airport suggests that runway planning consistent with wet runway conditions is appropriate to provide an acceptable level of safety for both current and forecast air traffic.

Although the accelerate-stop calculation is not reflected in the “normal” takeoff distances required for takeoff roll and climb to 50 feet, it reflects a valid margin of safety for pilots operating multi-engine aircraft and warrants consideration in the master plan moving forward. It is also important to note that the proposed increase in runway length is consistent with the basic requirements of small ADG I multi-engine piston aircraft routinely operating on the runway, and is not solely driven by the needs of larger aircraft.

Preliminary Airside Improvements

The proposed airside improvements include items that are related to the anticipated upgrade from Airplane Design Group I to II, and an increase in runway length to address safety requirements for current and forecast multi-engine aircraft activity. The proposed airside improvements are depicted in **Figure 5-1**:

- Increase Runway Length to 4,000 feet ;
- Increase Runway Width from 60 to 75 feet;
- Increase Runway Protected Areas (OFZ, OFA, RSA) dimensions along entire runway and beyond runway extension;
- Modify current grades and drainage as needed;
- Relocate (Shift) West Parallel Taxiway 15 feet west to meet ADG II runway separation standard;
- Extend parallel taxiway and relocate aircraft hold area in conjunction with runway extension;
- Increase Parallel Taxiway and Exit Taxiway Widths to 35 feet;
- Remove existing taxiway pavement (ADG I sections); and
- Relocate midfield exit taxiway per FAA runway incursion/taxiway design guidance.

RUNWAY EXTENSION

A proposed 399-foot runway extension is located at the south end of the runway. The extension would increase the current runway length from 3,601 feet to 4,000 feet to improve operational safety and capabilities for current and forecast multi-engine aircraft. Options for locating the extension at the north end of the runway, or divided between the north and south ends of the runway were considered but not presented due to several site conditions and factors. The current visual guidance indicator for Runway 16 is currently turned off due to off-airport obstructions (trees) in the visual glide path. Although clearing obstructions penetrating the current glide path is identified as a high priority for safety, moving the Runway 16 end to the north would increase the amount of obstruction penetration and require additional tree removal off airport property. Shifting the runway end northward would also move the Runway 16 approach path and airport traffic pattern closer to the more densely populated areas of Bandon.

The proposed south runway extension allows the runway, protected ground surfaces (runway safety area, object free area, obstacle free zone), and the future runway protection zone (RPZ) for Runway 34 to be contained entirely within airport property. Airport control of the future Runway 34 RPZ will permit required tree clearing in the first 1,000 feet of the future runway approach surface without securing avigation easements from adjacent property owners.

The timing of the proposed runway extension and the timing of the proposed runway widening (described below) has not been determined. The recommended future width of Runway 16/34 is 75 feet, which meets ADG II standards. In the event the runway extension project was implemented before the upgrade to ADG II, the current runway width of 60 feet would be maintained, and later widened to 75 feet as part of the overall runway widening project.

The proposed runway extension would include runway edge and threshold lighting. The existing precision approach path indicator (PAPI) and runway end identifier lights (REIL) on Runway 34 would be relocated or replaced depending on the age and condition of the units at the time of construction.

Runway Extension Reserve

A 599-foot runway extension reserve is identified at the south end of runway. The runway extension reserve is consistent with the long-term forecast demand for Bandon State Airport, but would require potential property acquisition and control of the Runway 34 reserve RPZ that extends well south of the current south airport property line.

The reserve is intended to reflect the potential demand for additional runway length to accommodate business aircraft. The total length of the existing runway, proposed extension and extension reserve is 4,600 feet, which would accommodate a slightly larger, but still limited segment of the ADG II business aircraft fleet. By comparison, the main runway at Southwest Regional Airport in North Bend is 5,980 feet long. If desired, identifying a long term development reserve can assist local land use planning officials in evaluating compatibility of new proposed development south of the airport.

Runway Width

Based on the requirements for Approach Category A and B aircraft in ADG II, Runway 16/34 would be widened from 60 feet to 75 feet. As depicted, the existing runway centerline and crown is maintained and the additional runway width and shoulders is provided on both sides of the runway as part of a reconstruct.

The proposed western shift of the parallel taxiway (described below) assumes the current runway centerline is maintained during widening. However, an alternative design approach could shift the runway centerline (and rebuild the crown) 15 feet east to obtain the required ADG II runway width and allow the parallel taxiway centerline to be maintained in its current location.

Runway Protected Areas

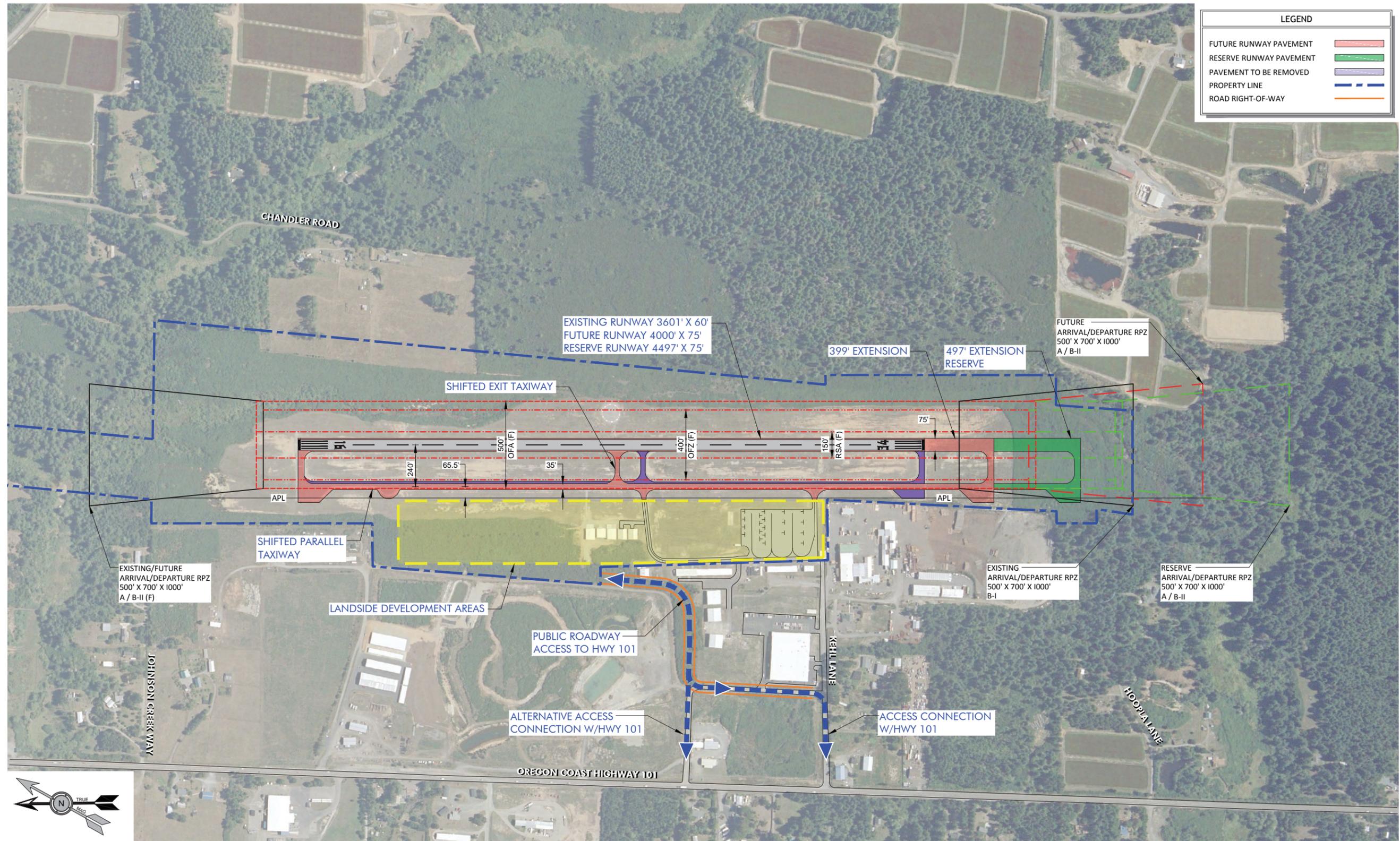
As part of the upgrade to ADG II the existing runway safety area (RSA), object free area (OFZ), and obstacle free zone (OFZ) will be expanded to meet dimensional requirements. The ADG II protected areas are contained entirely within airport property. The expanded footprint of the RSA requires grading and

compaction of the surface and clearing of any existing obstructions. The OFA and OFZ are required to be cleared of obstructions, but do not require additional surface preparation (e.g., compaction).

Taxiway Improvements

The west parallel taxiway is shifted 15 feet west to meet the FAA ADG II runway-to-parallel taxiway separation standard of 240 feet. The parallel taxiway and the major exit taxiways will be widened to 35 feet (some exit taxiways may be wider depending on design and function). The existing aircraft hold area located near the end of Runway 34 is relocated south as part of the proposed runway extension. The aircraft hold area located adjacent to Runway 16 would be maintained on the shifted parallel taxiway.

The existing mid-runway exit taxiway is relocated north of its existing location to address FAA runway incursion/taxiway design criteria. The shift in the taxiway is intended to interrupt the direct aircraft access path between the adjacent apron access taxiway and the runway, thereby increasing pilot situational awareness.



Preliminary Landside Options

The landside area for Bandon State Airport consists of the main apron, fueling area, and conventional hangars located west of the runway. The preliminary development options prepared focus on improving the efficiency of facility layouts, conforming to FAA design standards, and identifying infill opportunities on airport property. The landside options do not include improvements to the adjacent off-airport hangar development. A primary consideration in evaluating the landside options is to determine the desired mix of aircraft parking and other development (hangars, aircraft fueling, etc.) that can be accommodated within the defined areas while meeting FAA design standards.

LANDSIDE OPTION 1

Landside Option 1 (see **Figure 5-2**) reconfigures the landside area and existing main apron to accommodate a variety of facilities and aircraft parking.

The elements of Option 1 include:

- Conventional hangar sites located north of main apron (7 hangars depicted in addition to commercial/FBO hangar);
- Reconfigured/expanded apron (ADG II taxiway access between all parking rows) that includes the existing apron with additions on the east and north sides.
 - The new aircraft parking line (APL) is established 305.5 feet from runway centerline (65.5 feet west of the relocated parallel taxiway), which meets ADG II Taxiway OFA clearing standards;
- Three convertible parking rows (dual markings) on the main capable of accommodating large aircraft drive-through parking and small airplane tiedowns;
 - Parking capacity for large aircraft would range from approximately 2 to 10, depending on row assignments for large and small aircraft;
 - The apron and reserve could accommodate up to 35 small aircraft when large aircraft are not being accommodated;
- Each aircraft parking row is sized to accommodate a double row of small airplane tiedowns or small to medium business aircraft (maximum 60 feet long) and is served by ADG II taxiways with direct connection to parallel taxiway;
- Reconfigured aviation fuel storage and dispensing area (Jet A and AVGAS) clear of adjacent ADG II taxiway object free areas;
- Upgraded and new access taxiways (ADG I and ADG II) to serve existing and future hangars north of the main apron;

- A reserve for locating a new general aviation terminal/fixed base operator (FBO) building, maintenance hangar and small apron;
- Public access roadway connection to Highway 101 (longer term requirement for public use FBO/terminal, requires property acquisition);
- Internal airport access road and vehicle parking adjacent to FBO and hangars (requires property acquisition/easement from Aero Club parking lot to hangar area);
- Redevelopment potential for existing Aero Club hangars and buildings;
- Relocated fire district building to accommodate apron reconfiguration.

The primary feature of Landside Option 1 is the ability to maintain current apron function and accommodate near-term hangar development north of the apron and aircraft fueling apron.

The reconfiguration of the main apron is designed to address FAA design standards for taxiway OFA clearance while preserving maximum flexibility in accommodating a mix of large and small aircraft. The timing for apron reconfiguration may be determined by a variety of factors, but is typically deferred until major pavement rehabilitation is required or if apron reconfiguration is needed to accommodate changes in aircraft parking demands.

The reconfiguration of the aircraft fueling area is intended to address the current practice of fueling aircraft blocking an adjacent taxiway. For planning purposes, the aboveground fuel storage tanks are located at least 50 feet from the nearest structure. The aircraft fueling area maintains the existing 100LL Aviation Gasoline (AVGAS) while providing space for a future jet fuel (or other fuel grade) storage tank. The fueling area is sized to accommodate one or two aircraft clear of the adjacent taxiway OFAs.

The reserve area identified for a general aviation terminal/FBO building is intended to protect the airport's potential to accommodate a facility in the future. Since this type of building is not funded by FAA, market conditions generally dictate the financial feasibility of construction for the airport owner, FBO, or a third party. The effect of defining an FBO reserve in this area is to avoid constructing other items that could be located elsewhere. As currently depicted, the hangar development area located adjacent the FBO reserve accommodates seven small/medium conventional hangars. To maintain maximum long-term flexibility, these hangar sites should be developed before considering non-commercial hangar development within the FBO reserve. The FBO reserve location provides prime access to the adjacent aircraft fueling area, aircraft apron, and planned vehicle access and parking.

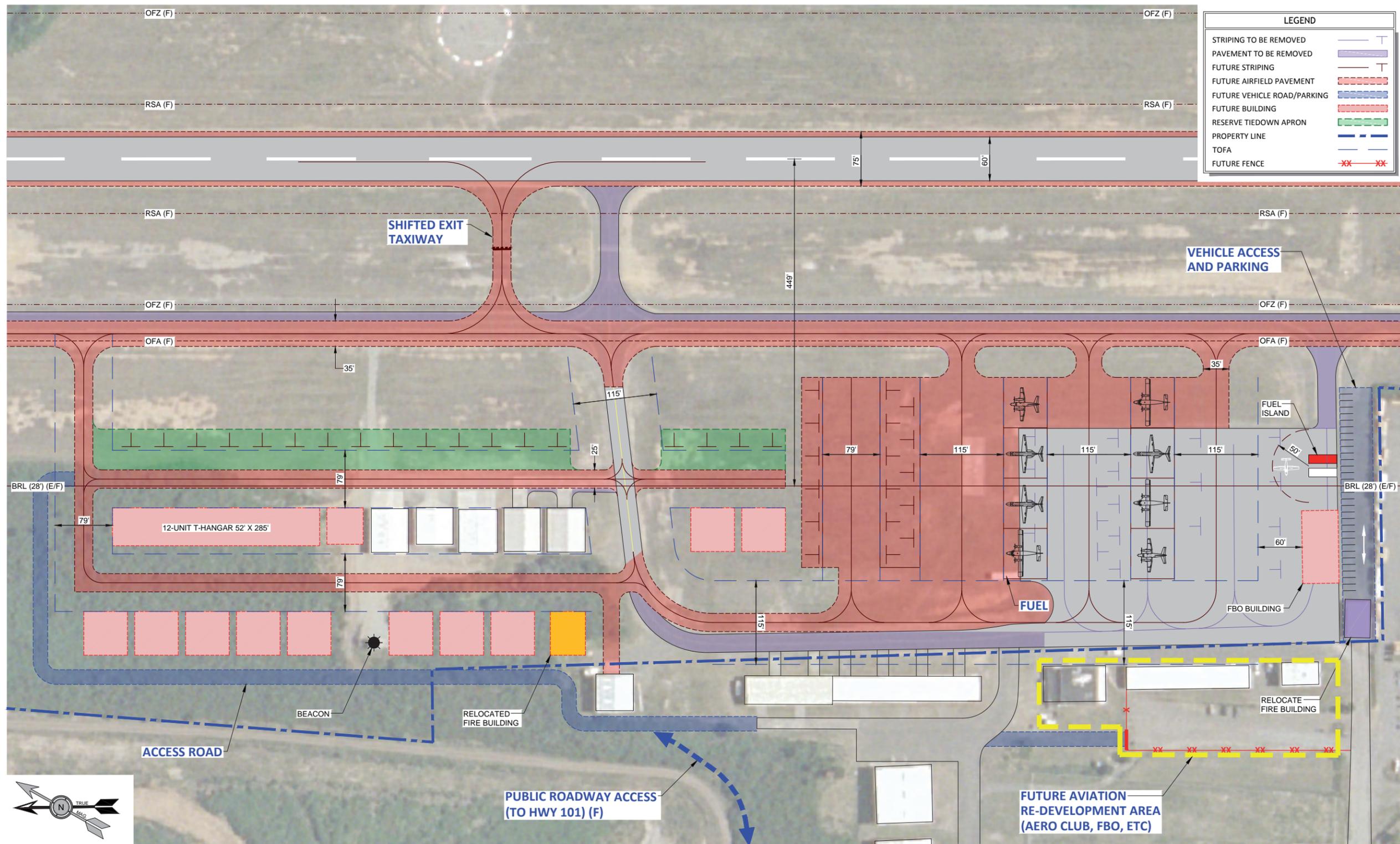
LANDSIDE OPTION 2

Landside Option 2 (see **Figure 5-3**) also reconfigures the landside area and existing main apron to accommodate a variety of facilities and aircraft parking. The primary feature of Landside Option 2 is the

reconfiguration of the main apron to allow development of a public use FBO building/general aviation terminal in the most accessible part of the landside area (south end). The site would provide convenient public access to the building and efficient access to aircraft parking and fueling. Additional aviation facilities are accommodated north of the main apron. The other features are similar to Landside Option 1, but presented in a different configuration.

The elements of Option 2 include:

- A reserve for locating a new general aviation terminal/fixed base operator (FBO) building, maintenance hangar and small apron at the south end of the main apron;
- Existing vehicle access to the airport via Kehl Lane provides public access to the FBO building/terminal;
- Relocated fire district building to accommodate apron reconfiguration;
- Relocated aviation fuel storage and dispensing area (Jet A and AVGAS) to the south end of the apron, adjacent to FBO building reserve;
- Reconfigured/expanded apron (ADG II and ADG I taxilane access) that includes the existing apron with additions on the east and north sides;
- Two large airplane drive-through parking rows (approximately 8 aircraft) with taxilane connections to the parallel taxiway;
- Two small airplane tiedown rows, plus reserve (17 tiedowns, 18 reserve tiedowns) with taxilane connections to the main apron taxilane that runs along the south side of the apron;
- Upgraded and new access taxilanes (ADG I and ADG II) to serve existing and future hangars north of the main apron;
- Conventional hangar sites located north of main apron (as currently depicted);
 - 2 conventional hangars depicted south of apron access taxilane;
 - 9 conventional hangars depicted north of apron access taxilane;
 - 1 multi-unit T-hangar (12 units);
- Redevelopment potential for existing Aero Club hangars and buildings;
- Internal airport access road to new north hangar development area (requires property acquisition/easement from Aero Club parking lot to hangar area); and
- Public access roadway connection to Highway 101 for new north hangar development area (requires property acquisition).



Preferred Development Options

The preliminary development alternatives presented earlier in this chapter were designed to accommodate the forecast aviation demand and the corresponding facility requirements for Bandon State Airport for the twenty-year planning period (2014-2034). The preliminary development alternatives were presented to ODA staff, the Planning Advisory Committee, the public, and FAA for review and comment. Based on the evaluation of the preliminary alternatives, refined concepts emerged that reflected the best combination of market demand and facility needs associated with Bandon State Airport.

The elements of the preferred airside and landside improvements will be incorporated into the draft Airport Layout Plan (ALP) and a draft Capital Improvement Program and presented for public review in the draft final airport master plan. A brief summary of the recommended improvements is provided below.

PREFERRED AIRSIDE IMPROVEMENTS

The preliminary airside improvements, previously depicted in **Figure 5-1**, consisted primarily of runway and taxiway improvements related to a future upgrade from Airplane Design Group I (ADG I) to Airplane Design Group II (ADG II) standards. These proposed improvements were evaluated and recommended without significant revision.

The recommended airside improvements focus primarily on upgrading the runway-taxiway system from ADG I to ADG II standards. It is noted that the existing runway-taxiway system does not require any significant upgrading based on its current ADG I activity. Based on the updated aviation activity forecasts and facility requirements assessment, growth in ADG II aircraft activity is anticipated, consisting of both single-engine and multi-engine turbine aircraft. The forecasts project sufficient ADG II activity within the next ten years to meet FAA criteria for design aircraft, however, the timing of the change in design group will be based on actual aircraft activity documented by ODA.

The planned upgrade in design standards increases the size of the runway-taxiway system footprint, including both hard surfaces and the adjacent protected areas. The physical elements of the upgraded ADG II runway-taxiway system at Bandon State Airport are contained entirely within airport property. The associated development setbacks for the runway-taxiway system are also increased. The aircraft parking line (APL) defined on the west side of the runway is located 65.5 feet from the future parallel taxiway centerline (305.5 feet from runway centerline); building setbacks are based on the airspace required to support nonprecision instrument approach capabilities.

Portions of the existing and future runway protection zones (RPZ) for Runway 16/34 extend beyond existing airport property boundaries. RPZs that extend beyond airport property require some level of airport-sponsor control to meet FAA standards. This can be achieved through the acquisition of an

aviation easement which controls activity on the ground and the height of natural (trees, terrain) and built items (structures, fences, etc.), or through the purchase of the land area.

The recommended airside improvements include the acquisition of an aviation easement for the Runway 16 RPZ and any additional areas required to clear the obstacle clearance surface (OCS) established for the Runway 16 precision approach path indicator (PAPI), which is currently out of service due to tree growth penetrating the glide path. Options for acquiring the property should be considered to ensure long term protection of the runway.

The primary features of the Preferred Airside Improvements include:

Upgrade Runway 16/34 to ADG II

- Increase runway width from 60 to 75 feet (maintain runway centerline; add 7.5 feet on each side of runway, plus 10-foot gravel shoulders)
- Maintain nonprecision instrument (NPI) markings on both runway ends;
- Increase runway pavement strength to 30,000 pounds for aircraft with single wheel landing gear;
- Modify current grades and drainage as needed;
- Upgrade runway obstacle free zone (OFZ), object free area (OFA) and runway safety area (RSA) to meet dimensional, clearing, and surface compaction (RSA only) standards for existing/future runway lengths;
- Replace existing medium intensity runway edge lights (MIRL), threshold lights, and lighted airfield signage;
- Replace existing precision approach path indicators (PAPI) and runway end identifier lights (REIL) based on operational condition, age, and remaining useful life;
- Relocate segmented circle and wind cone outside runway OFZ; and
- Extend Runway 16/34 and parallel taxiway by 400 feet at south end (increase runway length to 4,000 feet).

Upgrade Parallel Taxiway to ADG II and Taxiway Design Group (TDG) 2

- Relocate (shift) the west parallel taxiway 15 feet west to meet the 240-foot runway separation standard;
- Widen parallel taxiway and exit taxiways to 35 feet;

- Upgrade taxiway object free area (TOFA) and taxiway safety area (TSA) to meet dimensional, clearing, and surface compaction (TSA only) standards;
- Construct major taxiway pavements to same strength as the runway;
- Relocate midfield exit taxiway per FAA runway incursion/taxiway design guidance;
- Provide aircraft hold areas at both ends of the parallel taxiway, adjacent to runway thresholds;
- Locate aircraft hold lines 200 feet from runway centerline on exit taxiways to clear runway OFZ;
- Remove existing parallel taxiway pavement;
- Replace existing taxiway edge reflectors or upgrade to medium intensity taxiway edge lighting (MITL);
- Replace airport mandatory instruction signs (internally lighted or reflective); and
- Extend parallel taxiway and relocate aircraft hold area in conjunction with runway extension.

PREFERRED LANDSIDE OPTION

The recommended landside improvements depicted in **Figure 5-4** reflect a refined concept which emerged through the evaluation of the preliminary alternatives by PAC members, airport users, and ODA staff. The improvements address current needs while preserving long term options consistent with the airport's unique market potential. Development reserves are identified for future aircraft apron and hangar areas north of the main apron and hangar area. The conceptual development will be integrated into the updated Airport Layout Plan and refined as needed.

The primary elements of the landside improvements provide for efficient aircraft hangar and apron configurations that provide the ability to incrementally expand, based on demand. The recommended development is expected to be phased over a period of several years, depending on airport activity and the pace of construction. **Figure 5-5** illustrates the approximate phasing sequence for the major improvements (new construction, reconfiguration, etc.). The actual timing and sequencing of improvements may differ based on demand, funding availability and other factors.

The primary features of the Preferred Landside Option include:

Phase 1 & 2

- Develop conventional hangar sites (8 depicted) adjacent to the main access taxiway;
- Construct gravel access road and vehicle parking (adjacent to hangar site);
- Remove a section of the north access taxiway pavement to accommodate 3 hangar sites (Phase 2)

- Extend stub taxilane from main apron to access hangar sites (Phase 2); and
- Install automated vehicle gate and perimeter fencing (southwest corner of apron).

Phase 3 & 4

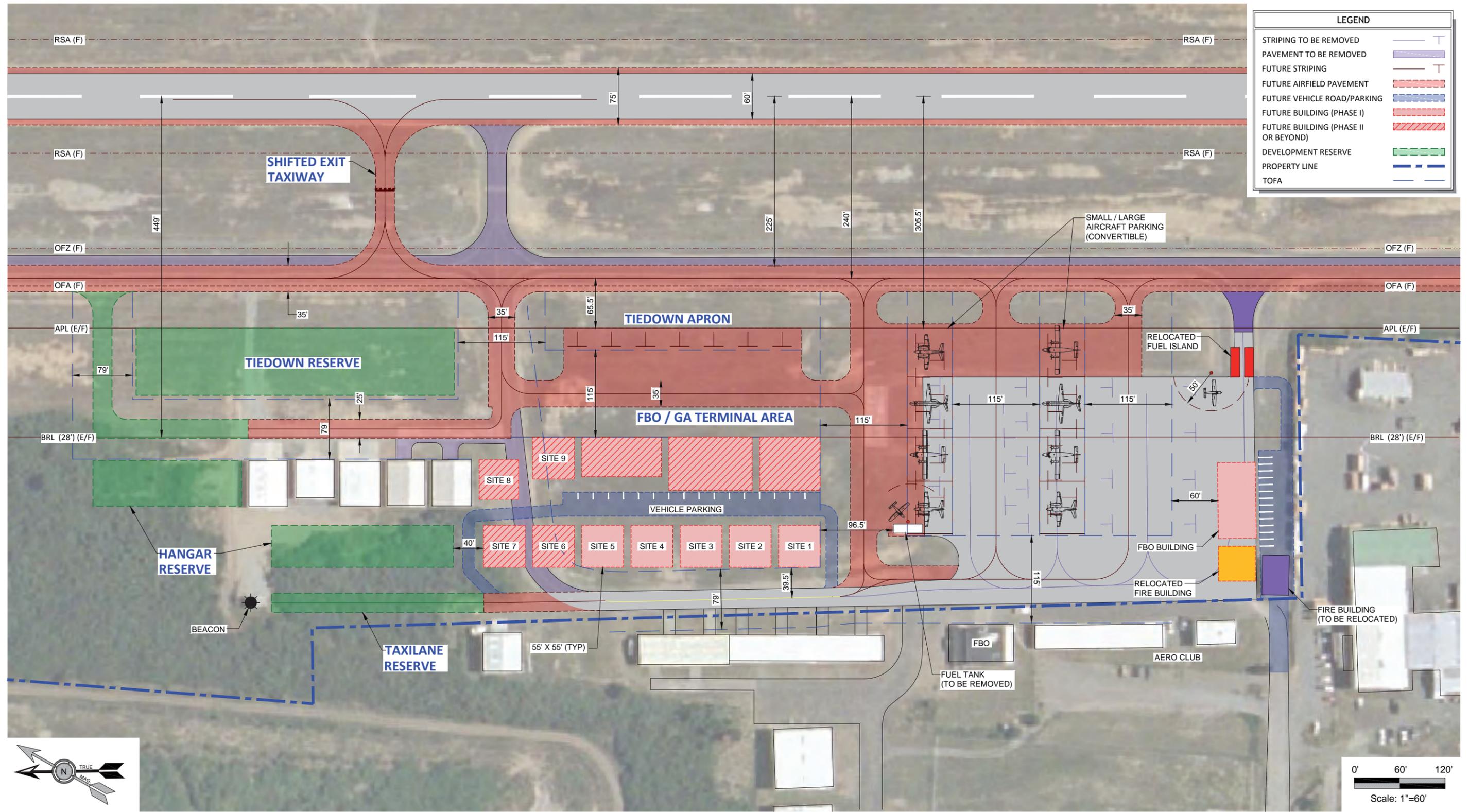
- Upgrade existing north hangar taxilane (5 existing hangars) to ADG I standards;
- Construct new taxilane to ADG II standards to access new large conventional hangar sites;
- Expand existing aircraft fuel apron to clear taxilane OFA; and
- Reconfigure main apron tiedowns to accommodate 17 small airplane tiedowns and/or 6 drive-through parking positions (dual configured parking rows) and meet applicable ADG I/II taxilane OFA standard.

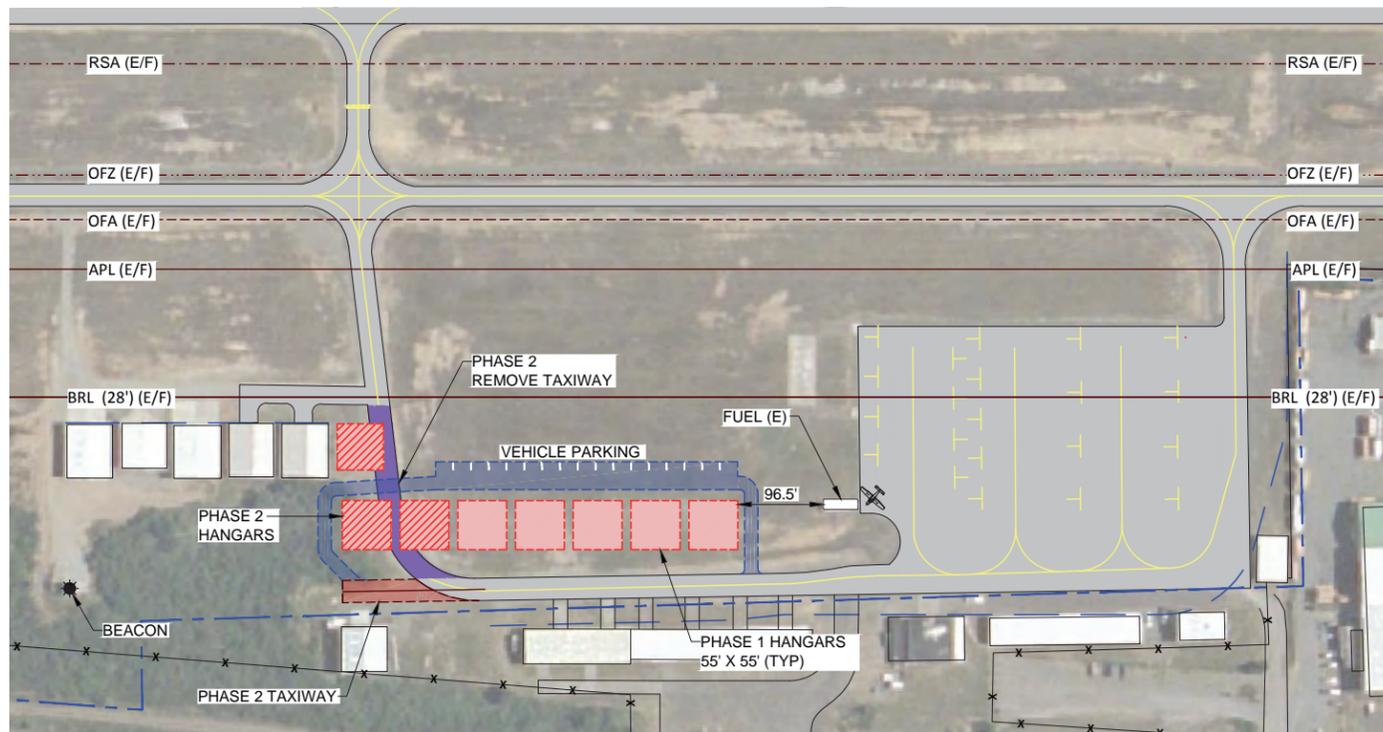
Phase 5

- Expand and reconfigure main apron tiedowns to accommodate 26 small airplane tiedowns and/or 8 drive-through parking positions (dual configured parking rows) and meet applicable ADG I/II taxilane OFA standard;
- Construct small airplane tiedown apron (7 tiedowns) adjacent to Phase 3/4 hangar taxilane;
- Construct new east-west access taxilane at north end of main apron and connect to Phase 3/4 hangar taxilane;
- Extend main apron parking row taxilanes to parallel taxiway;
- Remove the existing main apron south entrance taxiway; and
- Relocate aircraft fuel storage tanks and dispensing facilities to the south end of the main apron.

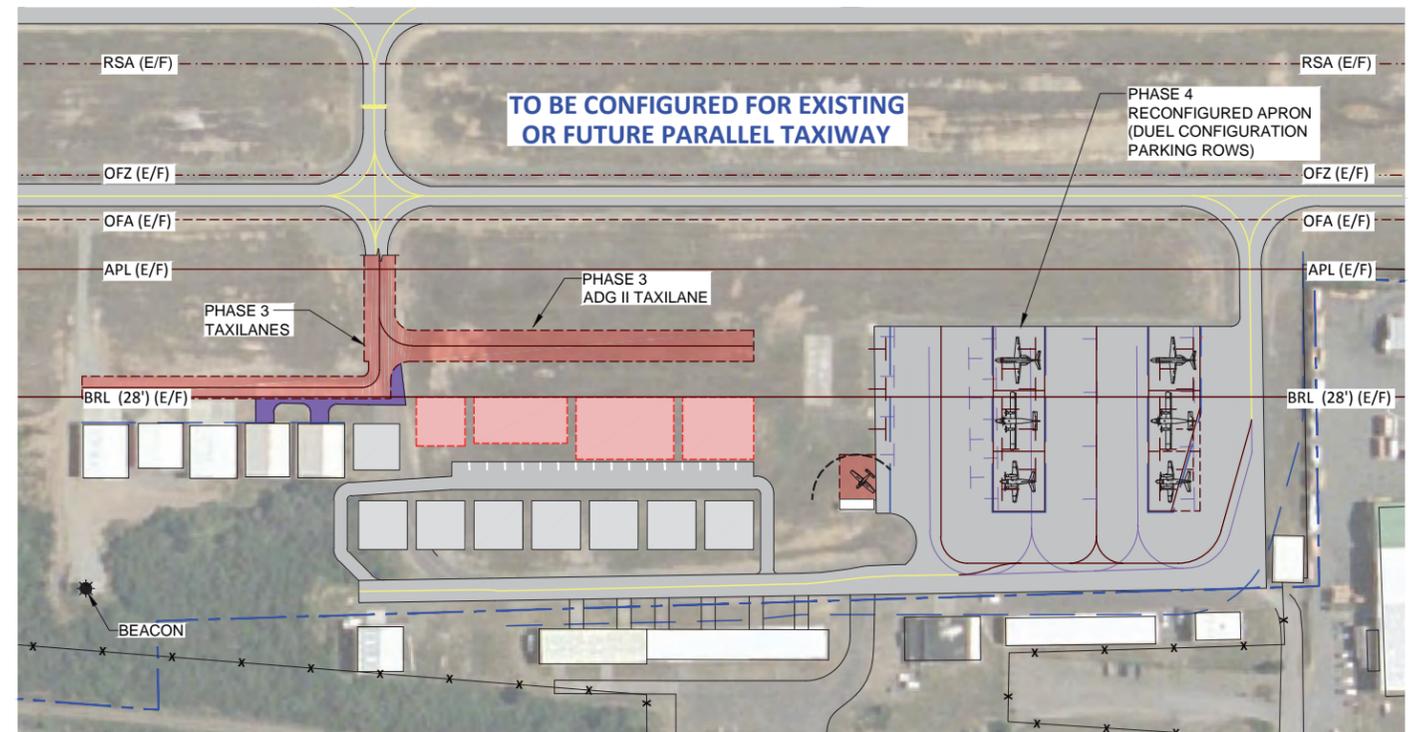
Phase 6

- Relocate existing fire building;
- Improve airport access road from Kehl Road;
- Vehicle parking (adjacent to main apron); and
- Construct general aviation terminal or FBO Building (south side of main apron).

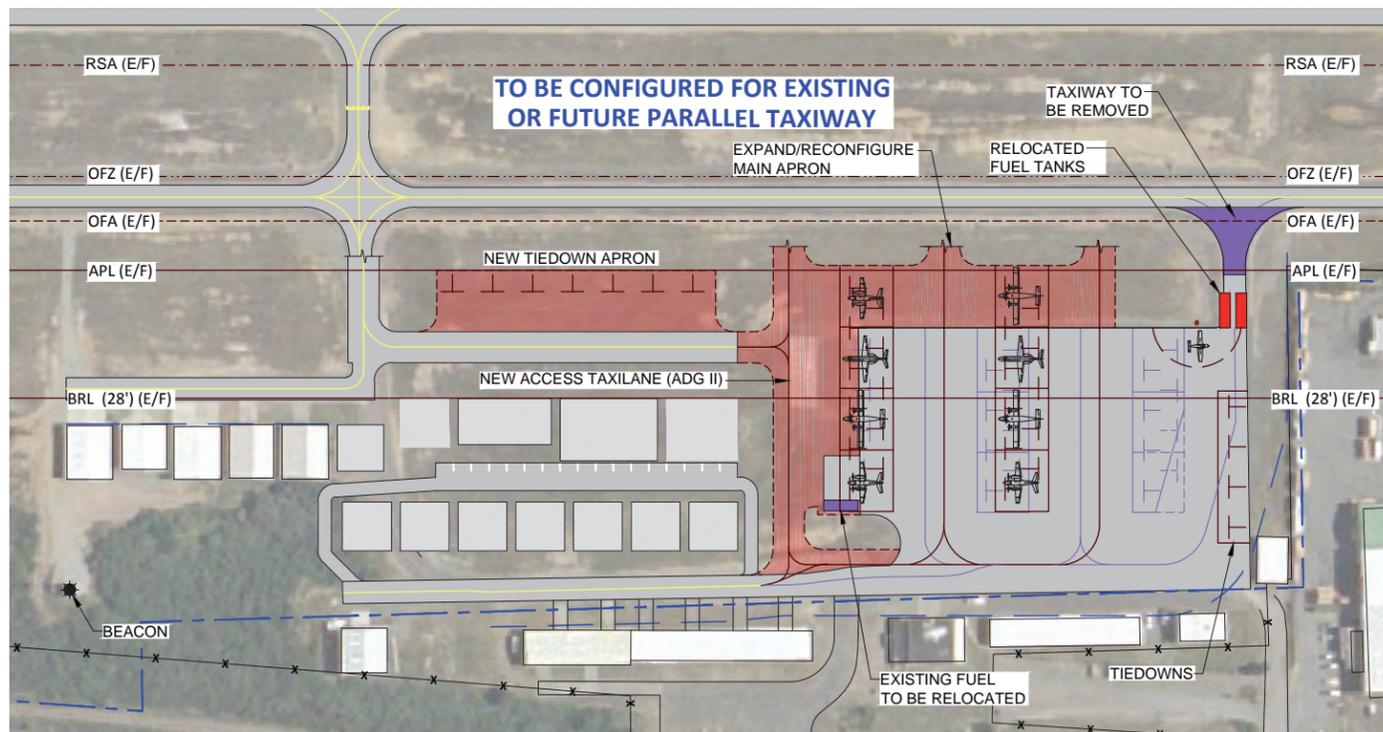




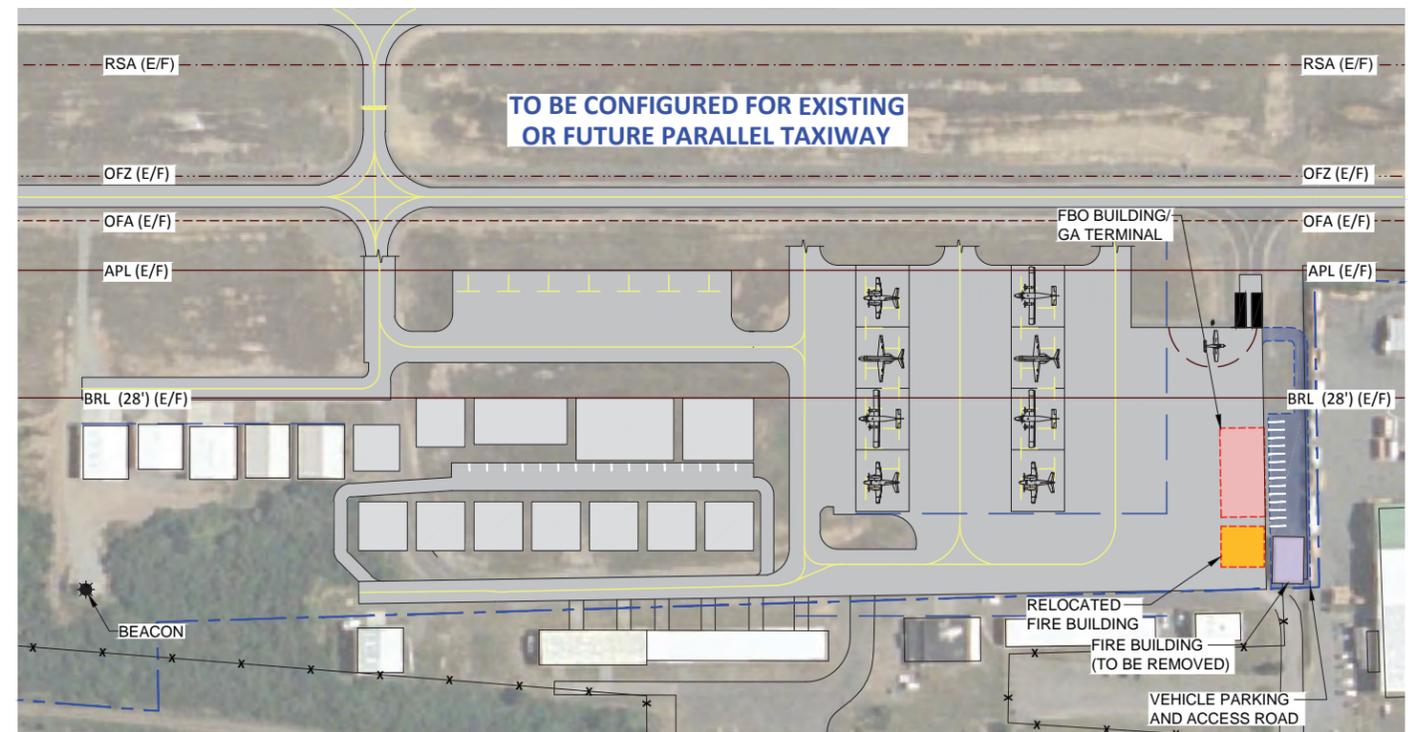
PHASE 1 & 2



PHASE 3 & 4



PHASE 5



PHASE 6

Chapter 6 – Environmental Review



Chapter 6 – Environmental Review

The purpose of this environmental review is to identify physical or environmental conditions of record, which may affect the recommended improvements at Bandon State Airport.



Introduction

The scope of work for this element is limited to compiling, reviewing, and briefly summarizing information of record from applicable local, federal, and state sources for the airport site and its environs. The environmental review technical memorandum is included in Appendix B and a brief overview is provided below.

Local Site Conditions

Bandon State Airport is located in an area of predominantly industrial and open space, with minimal amounts of rural, residential, and agricultural uses. An environmental review of the existing airport site conditions and items of interest was conducted as part of the master plan. This review included land use, water resources (wetlands, stormwater), species of concern, federal lands, and essential fish habitat.

The environmental review identified that there are no known sensitive, threatened, or endangered plants and animals, or critical habitats within a 2-mile radius of the airport. A wetland inventory was included in the review, which identified Johnson Creek on the north and east side of Bandon State Airport and an unnamed tributary of Johnson Creek on the east side of the airport. There are no documented species included in the Endangered Species Act (ESA) within Johnson Creek or its tributary. Wetlands are under the jurisdiction of both the Oregon Department of State Lands (DSL) and the US Army Corps of Engineers (Corps).

The review identified seven ESA species that may potentially be in the project area including the marbled murrelet, northern spotted owl, western snowy plover, western lily, silvery phacelia, pink sand verbena, and fisher. There are no documented occurrences of these species at Bandon State Airport.

Chapter 7 – Financial and Development Plan



Chapter 7 – Financial and Development Program



Introduction

The purpose of this chapter is to present the projects identified in the Airport Capital Improvement Program (ACIP) that have been developed and assembled based on the analysis conducted in the Facility Requirements and Development Alternatives chapters (Chapters Four and Five). The ACIP projects are summarized in **Table 7-1** later in the chapter. The ACIP is organized in short, intermediate, and long-term periods that reflect both project prioritization and financial capabilities. Several factors were considered in determining project prioritization, including safety, forecast demand, the need to maintain or replace existing airfield facilities, and financial capabilities of both ODA and FAA to support the development program based on existing funding mechanisms.

The master plan preferred alternative includes airside and landside elements. Minor pavement maintenance items such as periodic vegetation removal and crack filling are not included in the ACIP, but will need to be conducted by ODA on an annual or semi-annual basis.

A brief environmental review was prepared and is presented in Chapter 6. The review provides an overview of areas of potential concern related to proposed development. All federally funded projects will require some level of project-specific environmental study, as determined by FAA.

The ACIP lists all major projects included in the twenty-year planning period addressed in the Master Plan. Individual projects for the first five years of the planning period are listed in order of priority by year.

Projects for the intermediate and long-term phases of the planning period (years 6-20) are listed in order of priority but have not been assigned a year. Each project's eligibility for FAA funding is noted, based on current federal legislation and funding formulas. Specific project details are depicted on the updated airport layout plan and terminal area plan drawings contained in Chapter 8.

A primary source of potential funding identified in this plan is the FAA's Airport Improvement Program (AIP). As proposed, approximately 90 percent of the airport's twenty-year ACIP will be eligible for federal funding. Funds from this program are derived from the Aviation Trust Fund, which is the depository for all federal aviation taxes collected on such items as airline tickets, aviation fuel, lubricants, tires, aircraft registrations, and other aviation related fees. These funds are distributed by the FAA under appropriations set by Congress to all airports in the United States that are included in the federal airport system (National Plan of Integrated Airport Systems – NPIAS).

However, as noted in **Table 7-1**, the projected twenty-year total for FAA eligible projects in the ACIP significantly exceeds current FAA funding levels through the non-primary entitlement program (currently set \$150,000 per year). While other types of FAA funding may be available for some projects, it is reasonable to assume that despite establishing eligibility for FAA funding, not all eligible projects are likely to be funded by FAA in the timeline defined. As ODA manages its ACIP, maximizing the use of available FAA and other outside sources of funding is assumed. However, in some cases, the limited availability of outside funds may require projects to be deferred, or funded with increased levels of State or private funding.

Airport Development Schedule and Cost Estimates

Cost estimates for each project were developed in 2015 dollars based on typical construction costs associated for the specific type of project. The project costs listed in the ACIP represent order-of-magnitude estimates that approximate design engineering, environmental, other related costs, and contingencies. The estimates are intended only for preliminary planning and programming purposes. Specific project analysis and detailed engineering design will be required at the time of project implementation to provide more refined and detailed estimates of the development costs.

In future years, as the plan is carried out, these cost estimates can continue to assist management by adjusting the 2015-based figures for subsequent inflation. This may be accomplished by converting the interim change in the United States Consumer Price Index (USCPI) into a multiplier ratio through the following formula:

$$\frac{X}{I} = Y$$

Where:

X = USCPI in any given future year

Y = Change Ratio

I = Current Index (USCPI)¹

USCPI-U
236.119
(1982-1984 = 100)
March 2015

Multiplying the change ratio (Y) times any 2015-based cost figures presented in this study will yield the adjusted dollar amounts appropriate in any future year evaluation. Several different CPI-based indices are available for use and any applicable index may be substituted by ODA in its financial management program.

The following sections outline the recommended development program and funding assumptions. The scheduling has been prepared according to the facility requirements determined through the master plan evaluation. The projected staging of development projects is based upon anticipated needs and investment priorities. Actual activity levels may vary from projected levels; therefore, the staging of development in this section should be viewed as a general guide. When activity does vary from projected levels, implementation of development projects should occur when demand warrants, rather than according to the estimated staging presented in this chapter. In addition to major projects, the airport will continue to require regular facility maintenance such as pavement maintenance, vegetation control, sweeping, and lighting repair.

The first phase of the capital improvement program includes the highest priority projects recommended during the first five years of the planning period. Intermediate and long-term projects are anticipated to occur in the 6 to 20-year period, although changes in demand or other conditions could accelerate or slow demand for some improvements.

¹ U.S. Consumer Price Index for All Urban Consumers (USCPI-U)

SHORT-TERM PROJECTS

The short-term program contains work items of the highest priority. Priority items include improvements related to safety and preservation of existing pavement. Because of their priority, these items will need to be incorporated into the State Capital Improvement Program (SCIP) managed by the FAA Seattle Airport District Office (ADO) and ODA. To assist with this process, the short-term projects are scheduled in specific calendar years for the first five years of the planning period (2015-2020).

The main focus in the short-term development period is to address major pavement improvements and pavement preservation including sealcoats, crack filling, and repainting markings.

Short-Term Projects (1 to 5 years):

- Tree clearing in Runway 16 runway protection zone (RPZ) and Precision Approach Path Indicator (PAPI) glide path (requires aviation easement)
- Pavement Rehabilitation (portions may be funded through ODA pavement maintenance program)
 - Sealcoat Runway 16/34 and blast pads; repaint markings
 - Sealcoat parallel taxiway, exits taxiways, and aircraft hold areas; repaint markings
 - Sealcoat main apron and access taxiway; repaint markings
 - Apron and taxiway reconstruction (off airport – not FAA eligible)
- Phase 1 Landside Improvement Project
 - Construct gravel road and vehicle parking area
 - Utilities (electrical, stormwater drainage) extensions for new hangars
- Install weather reporting system (ASOS/AWOS)
- Install airport fencing and automated vehicle gate (airport entrance from Kehl Road)
- Relocate segmented circle and replace wind cone (outside OFZ)
- Phase 2 Landside Improvement Project
 - Main apron taxiway extension and taxiway and taxiway section removal to accommodate additional hangars
- Replace parallel taxiway edge reflectors

INTERMEDIATE & LONG-TERM PROJECTS

Several intermediate or long-term projects are considered to be current needs. However, based on the limited funding resources available, it was necessary to shift some projects to the longer-term timeline. However, projects may be completed sooner in the event that additional funding can be generated.

Intermediate Term Projects (6-10 years)

- Runway and Parallel Taxiway Upgrades to meet Airplane Design Group II (ADG II) standards
 - Environmental for runway improvements and new (relocated) parallel taxiway
 - Relocate Parallel Taxiway
 - Shift parallel taxiway 15 feet west to meet ADG II runway-taxiway separation requirements (240 feet)
 - Widen taxiway to 35 feet
 - Aircraft hold areas at both runway ends
 - Shift midfield exit taxiway per FAA design guidance
 - Install medium intensity taxiway lights (MITL) and runway mandatory hold signs
 - Runway Extension and Widening Project
 - Widen Runway 16/34 (75 feet) to meet ADG II standards
 - Extend runway 400 feet south (note: runway widening and extension may be constructed in separate projects)
 - Replace medium intensity runway lights (MIRL) and runway signage
 - Clearing and grading of the runway safety area, object free area, and obstacle free zone
 - Extend parallel taxiway 400 feet south (depends on timing of runway extension)
 - Replace Runway 16 & 34 precision approach path indicators (PAPI) at end of useful life
 - Replace runway end identifier lights (REIL) on Runway 16 & 34 at end of useful life
- Periodic pavement maintenance (crackfill, sealcoat, re-stripe) runway, taxiways, and apron

Long-Term Projects (11-20 years)

- Phase 3 Landside Improvement Project
 - Construct access taxilanes to existing/future hangars
 - Expand fuel apron (to eliminate apron taxilane OFA conflict)
- Phase 4 Landside Improvement Project
 - Overlay/reconstruct main apron
 - Reconfigure taxilanes and aircraft parking rows (combination drive-through parking and tiedowns)
 - Repaint markings
- Replace beacon and tower at end of useful life
- Periodic pavement maintenance (crackfill, sealcoat, re-stripe) runway, taxiways, and apron
- Phase 5 Landside Improvement Project
 - Expand/reconfigure main apron; extend taxilane connections to parallel taxiway;
 - Remove south taxiway connection (apron to parallel taxiway) and relocate aviation fuel storage tank(s) and dispensing facilities to southeast corner of main apron
 - Construct additional east-west access taxilane connector to parallel taxiway at north end of main apron
 - Reconfigure aircraft parking rows (combination drive-through parking and tiedowns)
 - Construct small airplane tiedown apron between parallel taxiway and hangars (north of main apron)
- Construct perimeter road including acquisition of right-of-way (Kehl Road to airport beacon)
- Relocate fire building
- Improve airport access road and construct vehicle parking (terminal area)
- Extend utilities (sanitary sewer) from Highway 101 to main apron
- Site preparation for new fixed base operator (FBO)/general aviation terminal building
- Update Airport Master Plan

**Bandon State Airport
20-YEAR CAPITAL IMPROVEMENT PROGRAM
2015-2035**

Current NPE \$ Accumulation: \$24,211 Through FY2015

Prepared by Century West Engineering

Short-Term	Year	Project	ID	Project Category	Unit	Quantity	Unit Cost	Subtotal Cost	40% Engineering/ Contingency/ Environmental	Total Cost	FAA GA Entitlement	Other FAA **	Local Costs			
2015	0	No Projects						\$0	\$0	\$0	\$0	\$0	\$0			
														<i>NPE Accumulation</i>	\$24,211	
Subtotal - Year 0								\$0	\$0	\$0	\$0	\$0	\$0		Total Available (NPE)	\$24,211
2016	1	Tree Clearing - RWY 16 RPZ (Avigation Easement)		Safety	LS	1	\$225,000	\$225,000	\$90,000	\$315,000	\$174,211	\$109,289	\$31,500			
		Runway - Sealcoat/Repaint Markings		Pavement Rehabilitation	LS	1	\$49,680	\$49,680	\$0	\$49,680	\$0	\$49,680	\$0	\$0		
		Parallel Taxiway and Mid-Field Exit Taxiway - Sealcoat/Repaint Markings		Pavement Rehabilitation	LS	1	\$31,300	\$31,300	\$0	\$31,300	\$0	\$31,300	\$0	\$0		
		Main Apron, South Entrance Taxiway, North Taxilane-Sealcoat/Repaint Markings		Pavement Rehabilitation	LS	1	\$37,202	\$37,202	\$0	\$37,202	\$0	\$37,202	\$0	\$0		
		Apron and Taxilane Reconstruction (off-airport)		Pavement Construction	LS	1	\$176,307	\$176,307	\$0	\$176,307	\$0	\$176,307	\$0	\$0	\$176,307	
														<i>NPE Accumulation</i>	\$24,211	
														<i>FY 2016 NPE</i>	\$150,000	
Subtotal - Year 1								\$519,489	\$90,000	\$609,489	\$174,211	\$227,471	\$207,807		Total Available (NPE)	\$174,211
2017	2	Install Automated Weather Observation System (AWOS)		Weather Observation	LS	1	\$192,000	\$192,000	\$76,800	\$268,800	\$150,000	\$91,920	\$26,880			
		Install Vehicle Automated Gate and Fencing (Airport Entrance from Kehl Rd)		Security	LS	1	\$25,000	\$25,000	\$10,000	\$35,000	\$31,500	\$0	\$3,500			
														<i>NPE Accumulation</i>	\$0	
														<i>FY 2017 NPE</i>	\$150,000	
Subtotal - Year 2								\$217,000	\$86,800	\$303,800	\$181,500	\$91,920	\$30,380		Total Available (NPE)	\$150,000
2018	3	Phase 1 Landside Improvements (Hangar Area) - Gravel Road and Vehicle Parking		Other	LS	1	\$70,000	\$70,000	\$28,000	\$98,000	\$88,200	\$0	\$9,800			
		Phase 1 Landside Improvements (Hangar Area) - Extend Electrical Service (underground)		Utilities	LS	1	\$65,000	\$65,000	\$26,000	\$91,000	\$0	\$0	\$91,000			
														<i>NPE Accumulation</i>	(\$31,500)	
														<i>FY 2018 NPE</i>	\$150,000	
Subtotal - Year 3								\$135,000	\$54,000	\$189,000	\$88,200	\$0	\$100,800		Total Available (NPE)	\$118,500
2019	4	Relocate Segmented Circle and Install New Windcone		Other	LS	1	\$50,000	\$50,000	\$20,000	\$70,000	\$63,000	\$0	\$7,000			
		Parallel Taxiway Edge Reflectors (Replacement)		Other	EA	50	\$200	\$10,000	\$4,000	\$14,000	\$12,600	\$0	\$1,400			
														<i>NPE Accumulation</i>	\$30,300	
														<i>FY 2019 NPE</i>	\$150,000	
Subtotal - Year 4								\$60,000	\$24,000	\$84,000	\$75,600	\$0	\$200,200		Total Available (NPE)	\$180,300
2020	5	Phase 2 Landside Improvements - Taxiway Extension and Taxiway Removal		Pavement Construction	LS	1	\$100,000	\$100,000	\$40,000	\$140,000	\$126,000	\$0	\$14,000			
														<i>NPE Accumulation</i>	\$104,700	
														<i>FY 2020 NPE</i>	\$150,000	
Subtotal - Year 5								\$100,000	\$40,000	\$140,000	\$126,000	\$0	\$222,600		Total Available (NPE)	\$254,700
								0-6	\$1,031,489	\$294,800	\$1,326,289	\$645,511	\$319,391	\$761,787	<i>Remaining NPE</i>	\$128,700

** Other FAA Funding Total listed for reference only based on general project eligibility; FAA funding levels are expected to be below projected needs.

Intermediate-Term	6 - 10	Project	Project Category	Unit	Quantity	Unit Cost	Subtotal Cost	40% Engineering/ Contingency/ Environmental	Total Cost	FAA GA Entitlement	FAA Eligible **	Local Costs
2021-2025		Runway Extension/Widening & Parallel Taxiway Shift - Environmental	Environmental	LS	1	\$200,000	\$200,000	\$80,000	\$280,000	\$252,000	\$0	\$28,000
		Runway Extension (400' south) and Widening (75'); Replace MIRL, Airfield Signs; RSA/OFZ/OFA Clearing and Grading	Pavement Construction	LS	1	\$1,600,000	\$1,600,000	\$640,000	\$2,240,000	\$626,700	\$1,389,300	\$224,000
		Parallel Taxiway Shift (ARC: A/B-II std) and Widening (35'); Shift Midfield Exit Taxiway, Install MITL, Airfield Signs	Pavement Construction	LS	1	\$1,600,000	\$1,600,000	\$640,000	\$2,240,000	\$0	\$2,016,000	\$224,000
		Runway 16 & 34 PAPI - Replacement	Lighting	LS	2	\$60,000	\$120,000	\$48,000	\$168,000	\$0	\$151,200	\$16,800
		Runway 16 & 34 REIL - Replacement	Lighting	LS	2	\$35,000	\$70,000	\$28,000	\$98,000	\$0	\$88,200	\$9,800
Subtotal - Year 6-10							\$3,590,000	\$1,436,000	\$5,026,000	\$878,700	\$3,644,700	\$502,600

** Other FAA Funding Total listed for reference only based on general project eligibility; FAA funding levels are expected to be below projected needs.

5 year NPE \$ = \$750,000

Long-Term	11-20	Project	Project Category	Unit	Quantity	Unit Cost	Subtotal Cost	40% Engineering/ Contingency/ Environmental	Total Cost	FAA GA Entitlement	FAA Eligible **	Local Costs
2026-2035		Phase 3 Landside Improvements - Construct ADG I/II Hangar Taxilanes; Expand Fuel Apron	Pavement Construction	LS	1	\$200,000	\$200,000	\$80,000	\$280,000	\$252,000	\$0	\$28,000
		Phase 4 Landside Improvements - Overlay/Reconfigure Main Apron (taxilanes and parking), Repaint Markings	Pavement Rehabilitation	LS	1	\$1,100,000	\$1,100,000	\$440,000	\$1,540,000	\$1,248,000	\$138,000	\$154,000
		Beacon and Tower-Replacement	Lighting	LS	1	\$150,000	\$150,000	\$60,000	\$210,000	\$0	\$189,000	\$21,000
		Main Apron and Taxilane-Sealcoat/Repaint Markings	Pavement Rehabilitation	SY	1	\$150,000	\$150,000	\$60,000	\$210,000	\$0	\$189,000	\$21,000
		Parallel Taxiway and Midfield Connector-Sealcoat/Repaint Markings	Pavement Rehabilitation	SY	1	\$150,000	\$150,000	\$60,000	\$210,000	\$0	\$189,000	\$21,000
		Runway-Sealcoat/Repaint Markings	Pavement Rehabilitation	LS	1	\$120,000	\$120,000	\$48,000	\$168,000	\$0	\$151,200	\$16,800
		Phase 5 Landside Improvements - Main Apron Expansion and E-W Access Taxilane; Additional Taxilane Connectors (2) to Parallel Taxiway, Relocate Fuel Storage, Reconfigure Aircraft Parking, Remove South Apron Entrance Taxiway	Pavement Construction	LS	1	\$525,000	\$525,000	\$210,000	\$735,000	\$0	\$661,500	\$73,500
		Perimeter Road Construction and Right of Way (Kehl Rd to Airport Beacon)	Other	LS	1	\$320,000	\$320,000	\$128,000	\$448,000	\$0	\$403,200	\$44,800
		Utilities Extension-Sanitary Sewer from HWY 101 to Main Apron	Utilities	LS	1	\$160,000	\$160,000	\$64,000	\$224,000	\$0	\$0	\$224,000
		Access Road Improvements and Vehicle Parking Area (Terminal Area)	Other	LS	1	\$150,000	\$150,000	\$60,000	\$210,000	\$0	\$189,000	\$21,000
		Construct North Tiedown Apron	Pavement Construction	LS	1	\$500,000	\$500,000	\$200,000	\$700,000	\$0	\$630,000	\$70,000
		New FBO Building (Estimated 3,000sq/ft) (site prep only)	Other	LS	1	\$50,000	\$50,000	\$20,000	\$70,000	\$0	\$63,000	\$7,000
		Master Plan Update	Other	LS	1	\$300,000	\$300,000	\$120,000	\$420,000	\$0	\$378,000	\$42,000
Subtotal Year 11-20							\$3,875,000	\$1,550,000	\$5,425,000	\$1,500,000	\$3,180,900	\$744,100

** Other FAA Funding Total listed for reference only based on general project eligibility; FAA funding levels are expected to be below projected needs.

20 Yr Total	\$8,496,489	\$3,280,800	\$11,777,289	\$3,024,211	\$7,144,991	\$2,008,487
--------------------	--------------------	--------------------	---------------------	--------------------	--------------------	--------------------

10 year NPE \$ = \$1,500,000

Capital Funding Sources

FEDERAL GRANTS

Federal funding is provided through the Federal Airport Improvement Program (AIP). This reauthorization is the latest evolution of a funding program originally authorized by Congress in 1946 as the Federal Aid to Airports Program (FAAP). The program provides grant funding for airports listed in the National Plan of Integrated Airport Systems (NPIAS). Under current legislation, eligible general aviation airports can receive up to \$150,000 per year in general aviation “non-primary entitlement” grants. If a project is anticipated to cost in excess of \$150,000, the participating airport can roll over the funding allocations for up to four years, at which time the accumulated total of funds can be used for larger projects. Any unused funds that remain beyond the maximum allowable roll over period revert to the FAA for use at other airports. These funds may only be used for eligible capital improvement projects and may not support airport operation and maintenance costs. Current FAA funding levels are 90 percent with a 10 percent local match.

FAA funding is limited to projects that have clearly defined need that has been identified through preparation of an FAA approved Airport Layout Plan (ALP). Periodic updates of the ALP are required when new or unanticipated project needs or opportunities exist that require use of FAA funds. The FAA will not generally participate in vehicle parking, utilities, building renovations, or projects associated with non-aviation developments.

Projects such as hangar construction are eligible for funding, although the FAA indicates that this category of project would be considered to be a much lower priority than other airfield needs.

The FAA also provides discretionary grants to airports. The dollar amounts of individual grants vary and can be significantly larger than the primary entitlements. Discretionary grants are awarded at the FAA's sole discretion. Discretionary funds are distributed after all entitlement funds have been allocated. For larger projects requiring substantially larger amounts of funding, non-primary entitlements, state apportionment, and discretionary grants are often combined. Other types of FAA funding include facilities & equipment (F&E) projects and Congressionally-appropriated dollars for specific projects.

STATE FUNDING

As a state owned airport, local funding (non-FAA) is provided by ODA and is included in the CIP presented in **Table 7-1**. In addition, ODA offers several programs for funding airport projects, which are outlined in this section.

Pavement Maintenance Program

The Pavement Management Program (PMP) programs airfield pavement maintenance funds on established multi-year cycles. This program is intended to preserve and maintain existing airfield pavements in order to maximize their useful lives and the economic value of the pavement. As noted earlier, several short-term pavement maintenance projects are identified for Bandon State Airport in the most recent PMP. The program funds pavement maintenance and associated improvements (crack filling, repair, sealcoats, etc.), including some items which have not traditionally been eligible for FAA funding.

Funding for the PMP is generated through collection of aviation fuel taxes. ODA manages the PMP through an annual consultant services contract and work is programmed on a 3-year regional rotation. The program includes a regular schedule of inspection and subsequent fieldwork. Benefits from the PMP include:

- Economy of scale in bidding contracts
- Federal/State/Local partnerships that maximize airport improvement funds
- PMP is not a grant program and local match is on a sliding scale (50% - 5% required)

The PMP includes the following features:

- Review prior year's Pavement Condition Index (PCI) reports
- Only consider PCI's above 70
- Apply budget
- Limit work to patching, crack sealing, fog sealing, and slurry sealing
- Add allowance for striping
- Program to include approximately 20 airports per year, depending on funding levels

Financial Aid to Municipalities (FAM) Grants

ODA's FAM grant program has been suspended in recent years due to a lack of funding. Efforts to resume the program are currently being considered by ODA. Previously, FAM grants up to \$25,000 were available to Oregon airports for eligible airport related projects.

Connect Oregon Program

In 2005, the Legislature created Connect Oregon, which used proceeds from lottery-backed bonds to provide grants and loans to fund non-highway transportation projects. In 2014, after the fifth installment of funding, the Legislature had provided \$382 million to the program. Connect Oregon grants fund up to 80-percent of project costs with a 20-percent sponsor match and loans up to 100-percent of project costs.

House Bill 2075

House Bill 2075 will increase the tax on aircraft fuels, providing new revenues for the State Aviation Account. The new tax on jet fuel (Jet-A) is one cent per gallon and aviation gasoline (AVGAS) is nine cents per gallon. These revenues will be distributed to fund a variety of aviation needs including:

- Assisting airports in providing local match for FAA AIP grants;
- Creation of grants to fund emergency preparedness and infrastructure projects;
- Creation of grants to fund services critical to aviation, aviation related business development, and airport development;
- Assisting in commercial air service to rural Oregon; and
- Improvements to state-owned airports.

State Capital Improvement Program (SCIP)

The FAA's Seattle Airport District Office (ADO) in conjunction with state aviation agencies in Oregon, Washington, and Idaho have developed a coordinated "state" capital improvement program, known as the SCIP. The SCIP is the primary tool used by FAA, state aviation agencies, and local airport sponsors to prioritize funding. Airport sponsors are required to provide annual updates to the short-term project lists annually in order to maintain a current system of defined project needs. The short-term priorities identified in the master plan CIP will be imported into the SCIP and will be subject to additional prioritization for funding in competitive statewide evaluations.

LOCAL FUNDING

As currently defined, the locally funded (ODA/tenant) portion for twenty-year planning period is estimated to be just over \$2.0 million. Hangar construction costs and building maintenance have not been included in the CIP, since no FAA funding is assumed.

Portions of local matching funds are generated through airport revenues, including land leases and hangar rentals. Airport sponsors occasionally fund infrastructure and revenue-generating development such as hangars, either through an inter fund loan or the issuance of long-term debt (bonds).

Chapter 8 – Airport Layout Plan



Chapter 8 – Airport Layout Drawings



Introduction

The options that were considered for the long-term development of Bandon State Airport described in Chapter 5 resulted in the selection of a preferred alternative. The preferred alternative has been incorporated into the Airport Layout Plan drawings, which are depicted in this chapter. The set of airport plans, which is referred to in aggregate as the “Airport Layout Plan” (ALP) has been prepared in accordance with FAA guidelines. The drawings illustrate existing conditions, recommended changes in airfield facilities, property ownership, land use, and obstruction removal. The ALP set is presented at the end of this chapter:

- Sheet 1 – Cover Sheet
- Sheet 2 – Airport Data Sheet
- Sheet 3 – Airport Layout Plan
- Sheet 4 – On-Airport Individual Area Plans
- Sheet 5 – Airport Airspace Plan (FAR Part 77)
- Sheet 6 – Runway 16/34 Inner Approach Surface / RPZ
- Sheet 7 – Runway 16 Approach Surface Plan and Profile
- Sheet 8 – Runway 34 Approach Surface Plan and Profile
- Sheet 9 – On-Airport Land Use Plan
- Sheet 10 – Off-Airport Land Use Plan
- Sheet 11 – Exhibit “A” Airport Property Plan

The Airport Layout Plan drawings provide detailed information for existing and future facilities. The future improvements depicted in the drawing set are consistent with the Airport Master Plan's updated twenty-year capital improvement program contained in Chapter 7. The ALP drawing set was submitted along with the draft final Airport Master Plan report to Federal Aviation Administration (FAA) for review and approval. The drawings will be reviewed by the FAA Airports District Office (ADO) with additional review coordinated with other FAA offices (Flight Procedures, Flight Standards, etc.). Once approved, the final ALP drawing set will be signed by Oregon Department of Aviation (ODA) and the FAA Seattle Airports District Office (ADO). As individual projects are completed, minor "as-built" updates to the ALP drawing may be completed (with FAA coordination) without updating the Airport Master Plan. A complete update of the full ALP drawing set will be conducted as part of the next Airport Master Plan update.

The Airport Layout Plan drawings are prepared using AutoCAD® computer-aided drafting software, which allows for easier updating and revision. The drawing files may also be imported into local geographic information systems (GIS) to support land use planning, airport overlay zone mapping, etc.

A brief summary of the individual drawings is provided below:

AIRPORT DATA SHEET DRAWING

The Airport Data Sheet drawing contains detailed runway and airfield dimensions, FAA dimensional standards, wind roses, and other data that is reflected on the sheets in the drawing set.

AIRPORT LAYOUT PLAN DRAWING

The Airport Layout Plan (ALP) drawing graphically depicts existing and future airfield facilities. Runway 16/34 is recommended to receive:

- a sealcoat and new non-precision instrument markings;
- increase runway width to 75 feet;
- runway extension to the south by 400 feet;
- replace medium intensity runway lighting (MIRL);
- replace precision approach path indicator (PAPI) lights; and
- install runway end identifier lights at both runway ends during the current twenty-year planning period.

It is recommended that the parallel taxiway (Taxiway A) receive:

- a sealcoat and new markings;
- shift taxiway to meet ADG II separation requirements;

- extend taxiway south by 400 feet to the new runway end;
- install medium intensity taxiway lighting (MITL); and
- shift the midfield runway exit taxiway.

Future facilities are color-coded (red) to distinguish them from existing facilities. Future facilities are represented in the Airport Master Plan's twenty-year Capital Improvement Program (CIP) as individual projects or project groupings. Long-term development reserves depicted on the ALP are also color-coded (green). These items are intended to serve as placeholders or are provided for reference only. Demand for facilities identified as development reserves is not anticipated to occur in the current twenty-year planning period and therefore the corresponding projects are not included in the Airport Master Plan CIP. A change of events that could move a development reserve into an actual project would require updated planning and coordination with FAA.

TERMINAL AREA PLAN DRAWINGS

A Terminal Area Plan drawing depicts facilities in the landside area located on the west side of Runway 16/34. The drawing provides additional detail for existing and new facilities. Recommended improvements include reconfigured/expanded aircraft parking apron, future hangar sites, relocated aircraft fuel storage, fencing and vehicle gates, improved access roads, and improved vehicle parking areas.

FAR PART 77 AIRSPACE DRAWINGS

The FAR Part 77 Airspace drawings depict the protected airspace defined for Runway 16/34 in Federal Aviation Regulation (FAR) Part 77, *Objects Affecting Navigable Airspace*. The Airspace Plan drawings depict the five "imaginary surfaces" defined in FAR Part 77.25 including the primary, transitional, approach, horizontal, and conical surfaces, previously described in Chapter 4. Part 77 surfaces should be free of built or terrain obstructions to the greatest extent possible. Objects that penetrate FAR Part 77 surfaces may require action to mark or remove depending on their severity, location, and the feasibility of the action. The drawing includes a table of obstructions with recommended dispositions.

The physical characteristics of the Part 77 surfaces are defined the size of aircraft using the runway and the approach capabilities of the runway.

- **Runway 16/34 Approach Surface:** Extends 10,000 feet from the end of the runway primary surface. The approach surface has a slope of 34:1 and represents the horizontal distance required for each increment of vertical rise.

- **Primary Surface:** Based on the non-precision approach standards for “other than utility” runway, the primary surface is 500 feet wide extending 200 feet beyond each end of the runway. The primary surface is a flat plane of airspace centered on the runway with the same elevation as the nearest point on the runway centerline. For Runway 16/34, the primary surface is 4,400 feet long and 500 feet wide.
- **Runway Transitional Surface:** The runway transitional surfaces extend outward and upward from the outer edges of the primary surface. The transitional surfaces have a slope of 7:1 and extend to an elevation 150 feet above airfield elevation and connect to the runway horizontal surface. Runway 16/34 has an approach transitional surface that extends upward at a 7:1 slope, extending 5,000 feet beyond the sides of the runway approach surface. There are areas of terrain penetration identified along the east side and the southwest side of the runway.
- **Horizontal Surface:** The horizontal surface is drawn from 10,000-foot radii that extend from both ends of the primary surface to form an oval. The horizontal surface is a flat plane of airspace with an elevation 150 feet above airport elevation. The majority of obstructions identified in the horizontal surface are trees located off airport property.
- **Conical Surface:** The conical surface extends from the outer edge of the horizontal surface at a slope of 20:1 for 4,000 feet.

RUNWAY APPROACH SURFACE PLAN AND PROFILE DRAWINGS

The Approach Surface drawings depict plan and profile views of the runway approach surfaces depicted in the FAR Part 77 Airspace Plan. The drawings provide additional detail in identify obstructions, terrain and other physical features within the approach surfaces. The drawings include obstruction data tables for items depicted on the drawing, using the same numbering identifiers from the overall Part 77 Airspace Plan.

RUNWAY RPZ & INNER APPROACH SURFACE DRAWINGS

The Runway Protection Zone (RPZ) and Inner Approach Surface Drawings depict detailed plan views of these areas and a profile view of the approach surface and threshold siting surface (when used). The drawings include obstruction data tables for items depicted on the drawing, using the same numbering identifiers from the overall Part 77 Airspace Plan and Approach Surface Plan and Profile drawings.

AIRPORT LAND USE PLANS

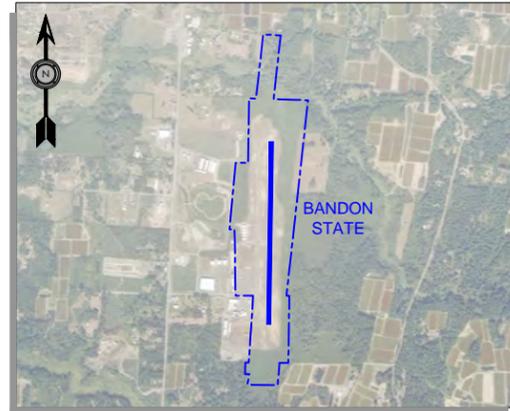
The Airport Land Use Plan drawings depict existing comprehensive plan and zoning designations for the airport and surrounding areas. Bandon State Airport is located just outside of Bandon’s city limits, within Coos County. The areas of Coos County and City of Bandon land use jurisdiction are depicted on the drawings.

EXHIBIT "A" – AIRPORT PROPERTY PLAN

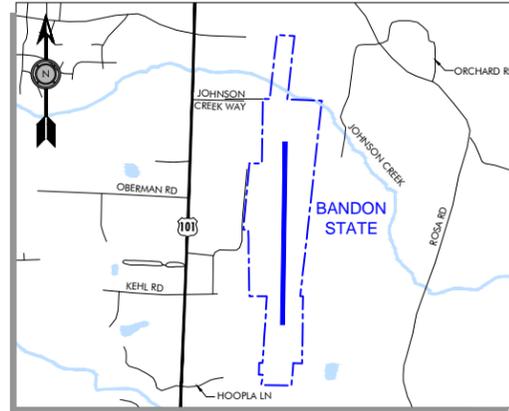
The Airport Property Plan drawing depicts all property owned by the State and property controlled by easements associated with the airport. The drawing notes the form of ownership or control (fee simple, aviation easement, etc.) and the date of acquisition, per FAA guidelines.

BANDON STATE AIRPORT (S05) AIRPORT MASTER PLAN

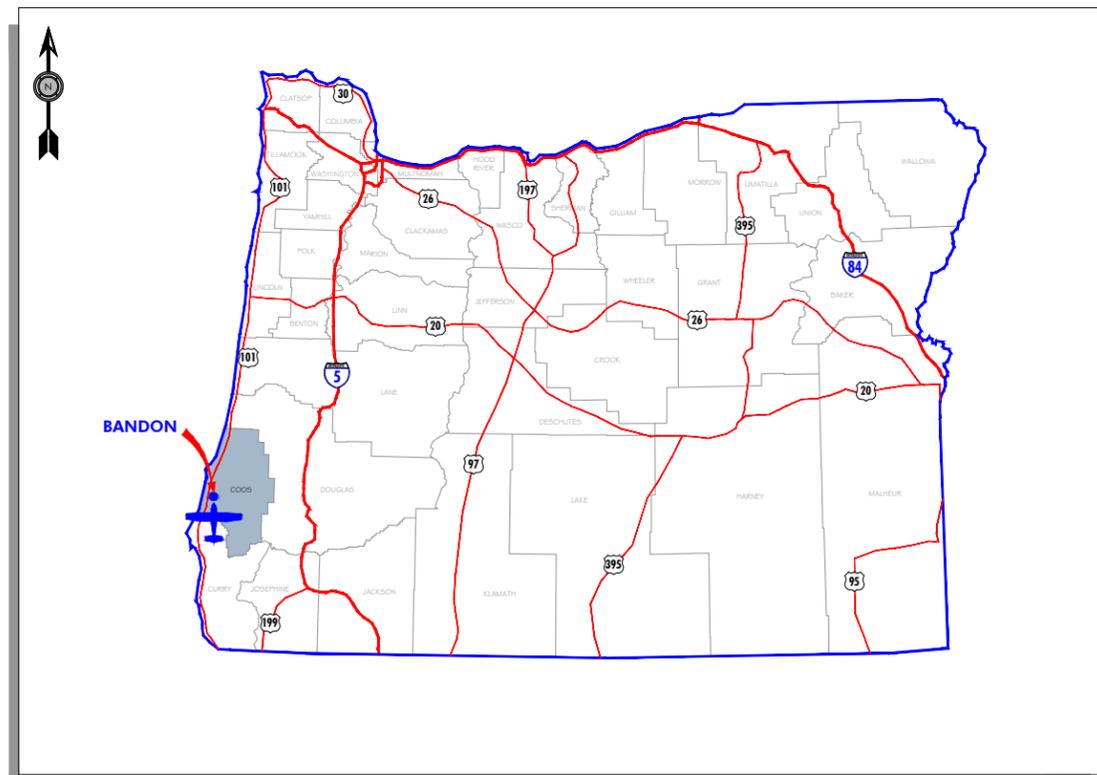
BANDON, OREGON
CWEC PROJECT NO. 40097050.01
AIP NO. 3-41-0006-007
MAY 2017



AERIAL PHOTO



VICINITY MAP



LOCATION MAP

SHEET INDEX

NUMBER	CONTENTS
1	COVER SHEET
2	AIRPORT DATA SHEET
3	AIRPORT LAYOUT PLAN
4	TERMINAL AREA PLAN
5	FAR PART 77 AIRSPACE PLAN 1-2
6	FAR PART 77 AIRSPACE PLAN 2-2
7	RUNWAY 16/34 INNER APPROACH SURFACE / RPZ
8	RUNWAY 16 APPROACH SURFACE PLAN AND PROFILE
9	RUNWAY 34 APPROACH SURFACE PLAN AND PROFILE
10	ON-AIRPORT LAND USE PLAN
11	OFF-AIRPORT LAND USE PLAN
12	EXHIBIT "A" AIRPORT PROPERTY PLAN

NO.	DATE	BY	APPR	REVISIONS	VERIFY SCALES BAR IS ONE INCH ON ORIGINAL DRAWING. 0" 1" IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.	FEDERAL AVIATION ADMINISTRATION APPROVAL APPROVAL DATE: _____ SIGNATURE _____	OREGON DEPARTMENT OF AVIATION APPROVAL APPROVAL DATE: _____ SIGNATURE _____	BEND OFFICE 1020 SW EMKAY DRIVE, #100 BEND, OR 97702 541.322.8962 541.382.2423 FAX	<h2>BANDON STATE AIRPORT</h2> <h3>COVER SHEET</h3>	FIGURE NO. -
						DESIGNED BY: DM DRAWN BY: JLS CHECKED BY: WMR SCALE: AS SHOWN DATE: MAY 2017 PROJECT NO: 40097050.01	SHEET NO. 1 OF 12			

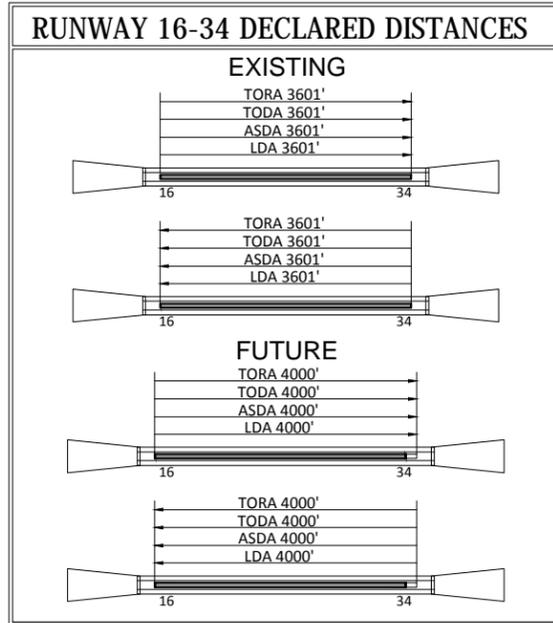
AIRPORT DATA TABLE			
DESCRIPTION	EXISTING	FUTURE	
AIRPORT ELEVATION (MSL)	123.03'	SAME	
AIRPORT ACREAGE	142.14	144.63	
ARP COORDINATES	LAT. N 43° 05' 11.25" LONG. W 124° 24' 28.31"	N 43° 05' 09.28" W 124° 24' 28.22"	
MAGNETIC DECLINATION	15°4'E (2017)	ANNUAL RATE OF CHANGE 0° 7'W	
MEAN MAX. DAILY TEMPERATURE	66.8° F	SAME	
FAA IDENTIFIER	S05	SAME	
DATUM	NAD 83/NGVD 88	SAME	

RUNWAY DATA TABLE		
	EXISTING CONDITIONS RUNWAY 16 - 34	FUTURE CONDITIONS RUNWAY 16 - 34
RUNWAY LENGTH AND WIDTH	3601' X 60' (SEE NOTE 3)	4000' X 75'
RUNWAY LIGHTING	MIRL	SAME
RUNWAY PAVEMENT STRENGTH (LBS)	12,000 SW	30,000 SW
RUNWAY PAVEMENT TYPE	ASPHALT / CONCRETE	SAME
RUNWAY PERCENT WIND COVERAGE (12 MPH)	95.66% (SEE NOTE 1)	SAME
RUNWAY PERCENT GRADIENT / MAXIMUM GRADE	.47%	.35%
AIRPORT REFERENCE CODE (ARC)	B-I	B-II
FAR PART 77 DESIGNATION	UTILITY (VISUAL)	OTHER THAN UTILITY (NPI)
NPIAS ROLE / SERVICE LEVEL	GENERAL AVIATION	SAME
TERMINAL NAVAIDS (SEE NOTE 4)	PAPI, REILS (SEE NOTE 4)	SAME
TAXIWAY LIGHTING	REFLECTORS	MITL
TAXIWAY MARKING	CENTERLINE; EDGE STRIPES	SAME

RUNWAY DATA TABLE				
	EXISTING CONDITIONS	EXISTING STANDARD	FUTURE CONDITIONS	FUTURE STANDARD
RUNWAY SAFETY AREA LENGTH AND WIDTH LENGTH BEYOND RUNWAY END	4081' X 120' 240'	4081' X 120' 240'	4600' X 150' 300'	4600' X 150' 300'
OBJECT FREE AREA LENGTH AND WIDTH LENGTH BEYOND RUNWAY END	4081' X 400' 240'	4081' X 400' 240'	4600' X 500' 300'	4600' X 500' 300'
OBSTACLE FREE ZONE LENGTH AND WIDTH LENGTH BEYOND RUNWAY END	4001' X 250' 200'	4001' X 250' 200'	4400' X 400' 200'	4400' X 400' 200'

	EXISTING CONDITIONS		FUTURE CONDITIONS	
RUNWAY END	16	34	16	34
RUNWAY APPROACH CATEGORY	VISUAL	VISUAL	NPI	NPI
RUNWAY APPROACH SLOPE	PART 77 REQUIRED 20:1	20:1	34:1	34:1
	ACTUAL 12:1 (SEE NOTE 2)	15:1	34:1	34:1
APPROACH VISIBILITY MINIMUMS	≥ 1 MILE	≥ 1 MILE	≥ 1 MILE	≥ 1 MILE
RUNWAY MARKINGS	NPI	NPI	NPI	NPI
RUNWAY END COORDINATES	LAT. N 43° 05' 29.0247" LONG. W 124° 24' 29.0887"	N 43° 04' 53.4821" W 124° 24' 27.5257"	N 43° 05' 29.0247" W 124° 24' 29.0887"	N 43° 04' 49.5428" W 124° 24' 27.3525"
INSTRUMENTATION AND APPROACH AIDS	NONE	NONE	GPS	GPS
APPROACH / RUNWAY END LIGHTING	PAPI, REILS	PAPI, REILS	SAME	SAME
CRITICAL AIRCRAFT (ARC)	BEECH KING AIR B100		PC-12 / CESSNA CITATION CJ2	
RUNWAY DESIGN CODE (RDC)	B-I	B-I	A/B-II	A/B-II
WINGSPAN	≤ 49 FEET		≤ 79 FEET	
WEIGHT	≤ 12,500 LBS		≤ 12,500 / > 12,500 LBS	
APPROACH SPEED	91 - 121 KNOTS		SAME	
LENGTH OF HAUL	< 500 MILES		SAME	
TOUCHDOWN ZONE ELEVATION	106.3'	118.9'	106.3'	120.7'

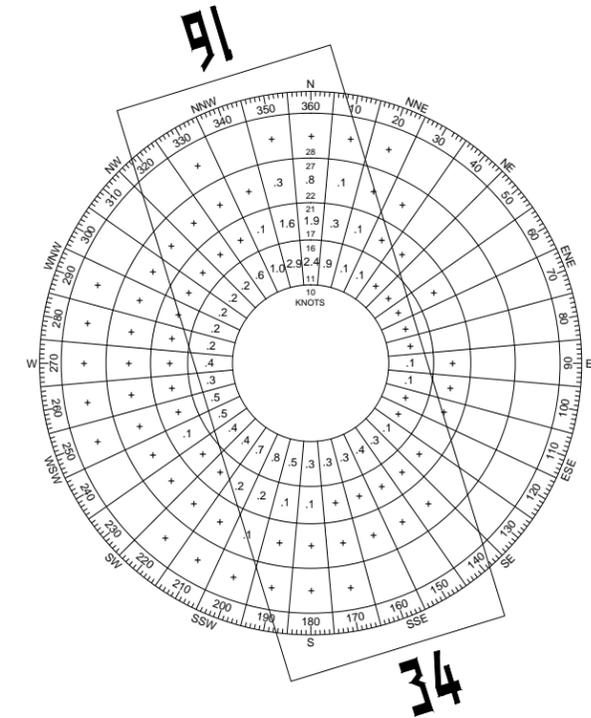
NON STANDARD CONDITIONS			
NO.	ITEM	DESCRIPTION	DISPOSITION
1	TAXILANE OFA (APRON)	AIRCRAFT TIEDOWNS WITHIN TAXILANE OFA	DISPLACE / RECONFIGURE APRON



TAXIWAY / TAXILANE DATA SHEET				
	EXISTING CONDITIONS	EXISTING STANDARDS	FUTURE CONDITIONS	FUTURE STANDARDS
TAXIWAY WIDTHS	VARIES	25'	35'	35'
TAXILANE WIDTHS	VARIES	25'	25' & 35'	25' & 35'
TAXIWAY SAFETY AREA	VARIES	49'	79'	79'
TAXIWAY OBJECT FREE AREA	VARIES	89'	131'	131'
TAXILANE OBJECT FREE AREA	VARIES	79'	79' & 115'	79' & 115'

NOTES:

- WIND DATA NOT AVAILABLE AT BANDON STATE AIRPORT. WIND DATA TAKEN FROM SOUTHWEST OREGON REGIONAL AIRPORT, LOCATED 19.5 NM NORTH OF BANDON.
- THE PAPI ON RUNWAY 16 HAS BEEN TAKEN OUT OF SERVICE UNTIL TREES PENETRATING THE PAPI VISUAL GLIDE PATH HAVE BEEN CLEARED.
- RUNWAY 16/34 HAS BLAST PADS (100' X 80') AT BOTH ENDS. A BLAST PAD WILL BE ADDED TO PLANNED RUNWAY 34 EXTENSION.
- THE TERMINAL NAVAIDS ARE OWNED BY OREGON DEPARTMENT OF AVIATION (ODA).



ALL WEATHER WIND ROSE

SOURCE : NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION (NOAA)
SOUTHWEST OREGON REGIONAL AIRPORT (OTH) AWOS

ANNUAL PERIOD RECORD 2007 - 2016
TOTAL OBSERVATIONS 253,045

ALL-WEATHER WIND ROSE ANALYSIS		
RUNWAY ALIGNMENT	WIND VELOCITY	ALL-WEATHER WIND COVERAGE
16-34	10.5 - KNOTS	95.66%
	13.0 - KNOTS	97.78%

"THE PREPARATION OF THIS DOCUMENT MAY HAVE BEEN SUPPORTED, IN PART, THROUGH THE AIRPORT IMPROVEMENT PROGRAM FINANCIAL ASSISTANCE FROM THE FEDERAL AVIATION ADMINISTRATION (PROJECT NUMBER 3-41-0006-007) AS PROVIDED UNDER TITLE 49, UNITED STATES CODE, SECTION 47104. THE CONTENTS DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THIS REPORT BY THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATE IN ANY DEVELOPMENT DEPICTED THEREIN NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE IN ACCORDANCE WITH APPROPRIATE PUBLIC LAWS."

NO.	DATE	BY	APPR	REVISIONS

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING. 0" IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

FEDERAL AVIATION ADMINISTRATION APPROVAL
APPROVAL DATE: _____
SIGNATURE _____

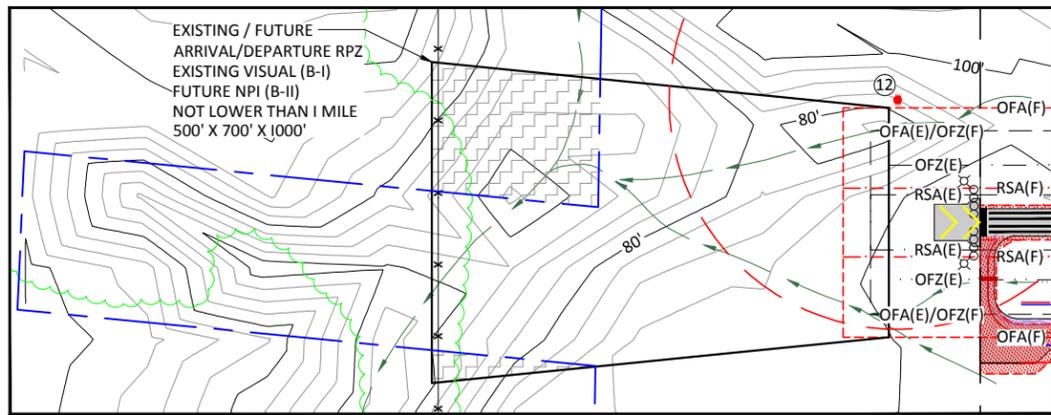
OREGON DEPARTMENT OF AVIATION APPROVAL
APPROVAL DATE: _____
SIGNATURE _____

CENTURY WEST ENGINEERING
BEND OFFICE
1020 SW EMKAY DRIVE, #100
BEND, OR 97702
541.322.8962
541.382.2423 FAX

DESIGNED BY: DM
DRAWN BY: JLS
CHECKED BY: VWMR
SCALE: AS SHOWN
DATE: MAY 2017
PROJECT NO: 40097050.01

BANDON STATE AIRPORT
AIRPORT DATA SHEET

FIGURE NO. -
SHEET NO. 2 OF 12



NORTH PROPERTY DETAIL

Scale: 1"=200'

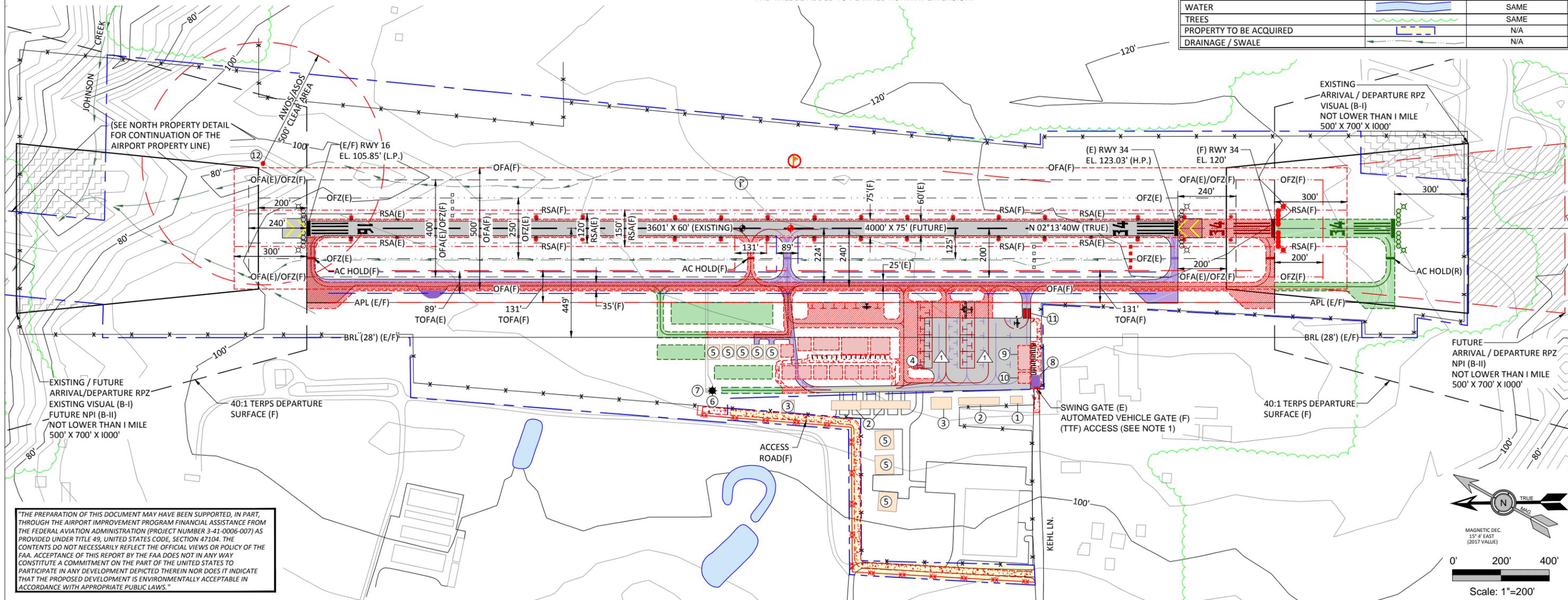
NON STANDARD CONDITIONS			
NO.	ITEM	DESCRIPTION	DISPOSITION
1	TAXILANE OFA (APRON)	AIRCRAFT TIEDOWNS WITHIN TAXILANE OFA	DISPLACE / RECONFIGURE APRON

BUILDING/FACILITY KEY			
DESCRIPTION		DESCRIPTION	
1	PILOT LOUNGE / AERO CLUB	7	ELECTRICAL EQUIPMENT BLDG.
2	T-HANGAR	8	FIRE DISTRICT BLDG. (TO BE RELOCATED)
3	FBO SHOP / HANGAR	9	FBO SHOP / HANGAR (FUTURE)
4	FUEL (EXISTING)	10	FIRE DISTRICT BLDG. (FUTURE)
5	PRIVATE HANGAR	11	FUEL (FUTURE)
6	BEACON	12	AWOS/ASOS (FUTURE)

NOTES:

- ODA HAS AN FAA-APPROVED THROUGH-THE-FENCE (TTF) AGREEMENT WITH BANDON AERO CLUB TO ACCESS THE AIRFIELD ALONG THE AIRPORTS WEST PROPERTY LINE, ADJACENT TO THE MAIN APRON AREA.
- NO OFZ PENETRATIONS.
- RUNWAY 16/34 HAS BLAST PADS (100' X 80') AT BOTH ENDS. A BLAST PAD WILL BE ADDED TO PLANNED RUNWAY EXTENSION.

LEGEND		
	EXISTING	FUTURE
BUILDINGS	[Symbol]	[Symbol]
AIRFIELD PAVEMENT	[Symbol]	[Symbol]
BUILDING RESTRICTION LINE (BRL)	BRL (E)	BRL (F)
AIRCRAFT PARKING LINE (APL)	APL (E)	APL (F)
AIRPORT PROPERTY LINE	[Symbol]	[Symbol]
RUNWAY SAFETY AREA (RSA)	[Symbol]	[Symbol]
OBJECT FREE AREA (OFA)	[Symbol]	[Symbol]
OBSTACLE FREE ZONE (OFZ)	[Symbol]	[Symbol]
TAXIWAY OBJECT FREE AREA (TOFA)	[Symbol]	[Symbol]
RUNWAY PROTECTION ZONE (RPZ)	[Symbol]	[Symbol]
TERMINAL INSTRUMENT PROCEDURE (TERPS)	N/A	[Symbol]
GROUND CONTOURS	-10'	SAME
AIRPORT REFERENCE POINT (ARP)	[Symbol]	[Symbol]
RUNWAY END IDENTIFIER LIGHTS (REIL)	[Symbol]	[Symbol]
VISUAL GUIDANCE INDICATORS (PAPI)	[Symbol]	[Symbol]
WIND INDICATOR	[Symbol]	[Symbol]
SEGMENTED CIRCLE WIND INDICATOR	[Symbol]	[Symbol]
FENCE	[Symbol]	[Symbol]
BEACON	[Symbol]	SAME
THRESHOLD LIGHTS	[Symbol]	[Symbol]
MEDIUM INTENSITY RUNWAY LIGHTS (MIRL)	[Symbol]	[Symbol]
ACCESS ROAD/VEHICLE PARKING	N/A	[Symbol]
AVIGATION EASEMENT	[Symbol]	[Symbol]
DEVELOPMENT RESERVE	N/A	[Symbol]
TO BE REMOVED	[Symbol]	N/A
WATER	[Symbol]	SAME
TREES	[Symbol]	SAME
PROPERTY TO BE ACQUIRED	[Symbol]	N/A
DRAINAGE / SWALE	[Symbol]	N/A



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CENTURY WEST ENGINEERING
BEND OFFICE
1020 SW EMKAY DRIVE, #100
BEND, OR 97702
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541.382.2423 FAX

DESIGNED BY: DM
DRAWN BY: JLS
CHECKED BY: WMR
SCALE: AS SHOWN

DATE: MAY 2017
PROJECT NO: 40097050.01

BANDON STATE AIRPORT
AIRPORT LAYOUT PLAN

FIGURE NO. -
SHEET NO. 3 OF 12

BUILDING/FACILITY KEY

DESCRIPTION	DESCRIPTION
① PILOT LOUNGE / AERO CLUB	⑥ BEACON
② T-HANGAR	⑦ ELECTRICAL EQUIPMENT BLDG.
③ FBO SHOP / HANGAR	⑧ FIRE DISTRICT BLDG. (TO BE RELOCATED)
④ FUEL	⑨ FBO SHOP / HANGAR (FUTURE)
⑤ PRIVATE HANGAR	⑩ FIRE DISTRICT BLDG. (FUTURE)

NOTES:

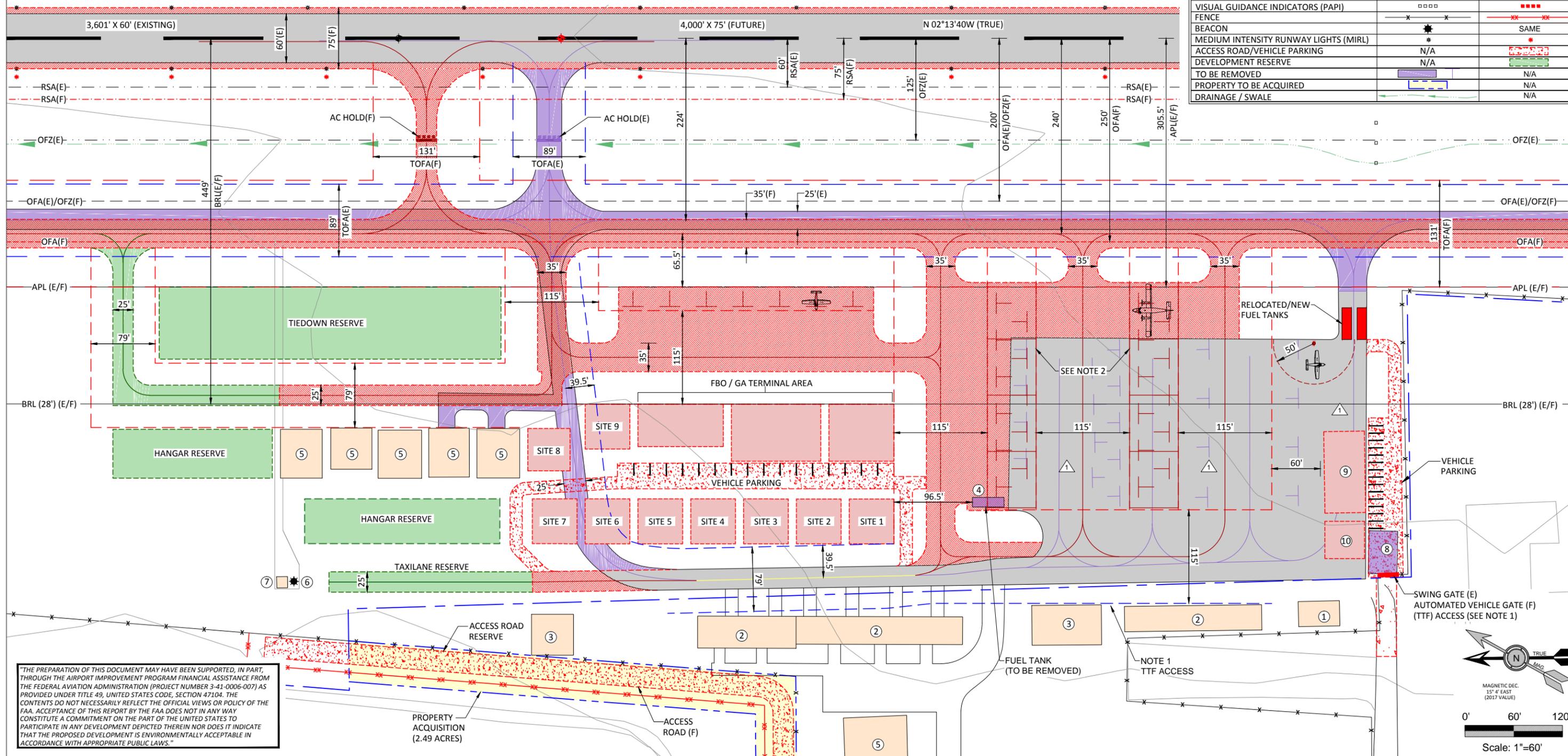
- ODA HAS AN FAA-APPROVED THROUGH-THE-FENCE (TTF) AGREEMENT WITH BANDON AERO CLUB TO ACCESS THE AIRFIELD ALONG THE AIRPORTS WEST PROPERTY LINE, ADJACENT TO THE MAIN APRON AREA.
- AIRCRAFT TIEDOWN ROWS ARE CONVERTABLE FOR USE BY ADG I AND II AIRCRAFT.

NON STANDARD CONDITIONS

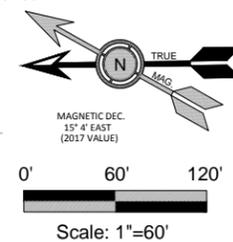
NO.	ITEM	DESCRIPTION	DISPOSITION
①	TAXILANE OFA (APRON)	AIRCRAFT TIEDOWNS WITHIN TAXILANE OFA	DISPLACE / RECONFIGURE APRON

LEGEND

	EXISTING	FUTURE
BUILDINGS		
AIRFIELD PAVEMENT		
BUILDING RESTRICTION LINE (BRL)	BRL (E)	BRL (F)
AIRCRAFT PARKING LINE (APL)	APL (E)	APL (F)
AIRPORT PROPERTY LINE		
RUNWAY SAFETY AREA (RSA)		
OBJECT FREE AREA (OFA)		
OBSTACLE FREE ZONE (OFZ)		
TAXIWAY OBJECT FREE AREA (TOFA)		
RUNWAY PROTECTION ZONE (RPZ)		
GROUND CONTOURS	10'	SAME
AIRPORT REFERENCE POINT (ARP)		
VISUAL GUIDANCE INDICATORS (PAPI)		
FENCE		
BEACON		SAME
MEDIUM INTENSITY RUNWAY LIGHTS (MIRL)		
ACCESS ROAD/VEHICLE PARKING	N/A	
DEVELOPMENT RESERVE	N/A	
TO BE REMOVED		N/A
PROPERTY TO BE ACQUIRED		N/A
DRAINAGE / SWALE		



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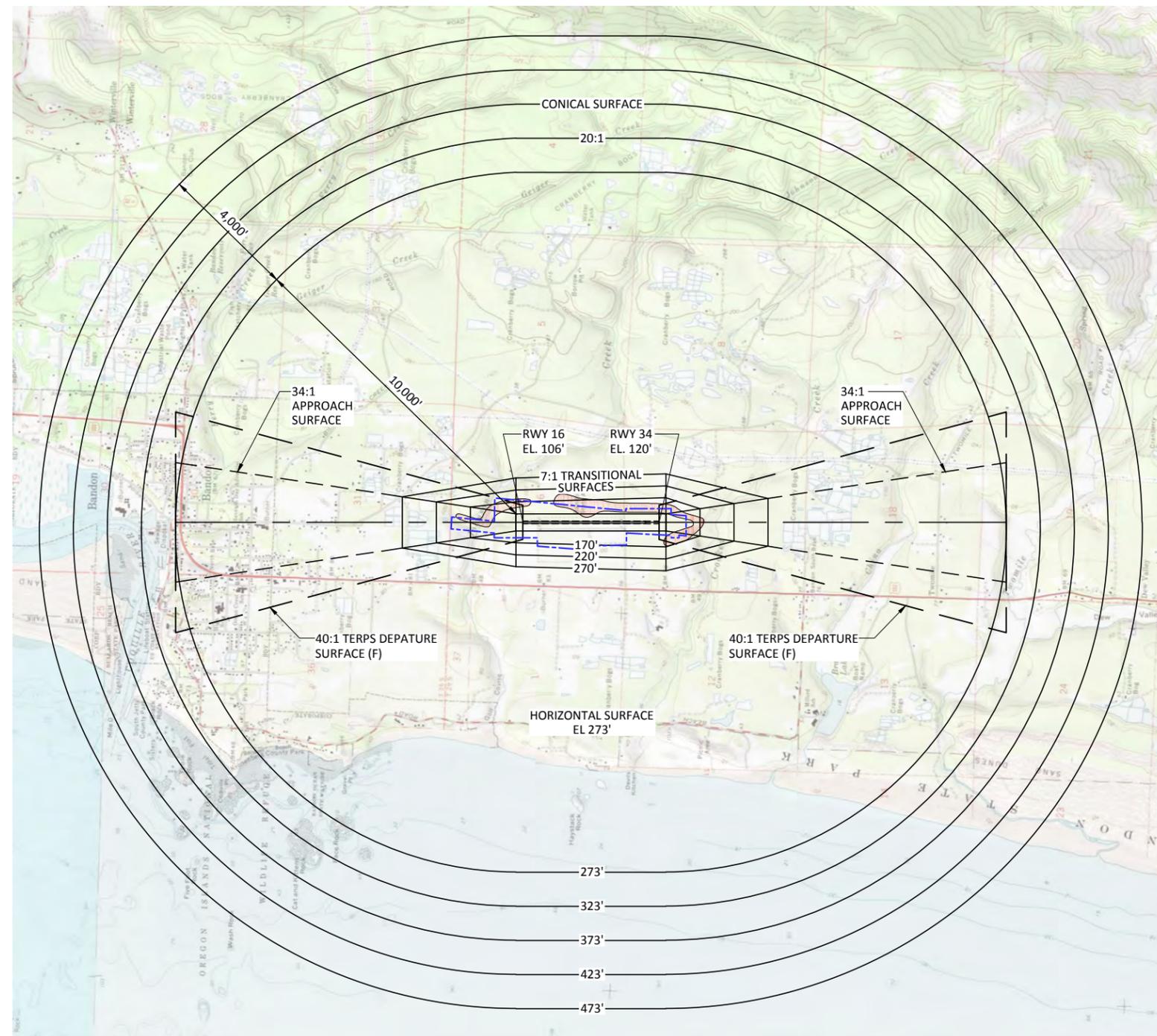
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BANDON STATE AIRPORT
TERMINAL AREA PLAN

FIGURE NO. -
SHEET NO. 4 OF 12



RUNWAY 16/34	
FAR PART 77 ULTIMATE DIMENSIONAL STANDARDS	
RUNWAY LENGTH = 4,000'	
RUNWAY TYPE = B-II (NPI)	
PRIMARY SURFACE WIDTH = 500'	
APPROACH SURFACE INNER WIDTH = 500'	
APPROACH SURFACE OUTER WIDTH = 3,500'	
APPROACH SURFACE LENGTH = 10,000'	
RADIUS OF HORIZONTAL SURFACE = 10,000'	
APPROACH SLOPE = 34:1	

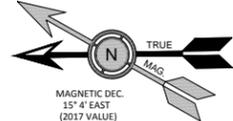
* SEE SHEET 6 OF 12 FOR DETAILED OBSTRUCTION DATA WITHIN THESE AREAS.

- NOTES:**
- DISTANCES FOR NOTED OBSTRUCTIONS ARE BASED ON THE FUTURE RUNWAY CONFIGURATION. DIMENSIONS INCLUDE 200' DISTANCE FROM RUNWAY END TO BEGINNING OF APPROACH.
 - OBSTRUCTIONS INFORMATION WAS OBTAINED FROM USGS QUAD MAPS, AIRPORT MANAGEMENT, AND AN OBSTRUCTION SURVEY (REFERENCED FROM THE 2004 AIRSPACE PLAN).
 - THE FOLLOWING HEIGHTS WERE ADDED TO THE SURFACE ELEVATION FOR CERTAIN GROUND FEATURES:
 10' FOR A PRIVATE ROAD
 15' FOR A PUBLIC ROAD
 17' FOR AN INTERSTATE ROAD
 23' FOR RAILROAD TRACKS
 - ALL ELEVATIONS ARE ON THE NAVD 88 DATUM, WITH THE EXCEPTION OF THE USGS MAP, WHICH IS NGVD 29 (REFERENCED FROM THE 2004 AIRSPACE PLAN).
 - COOS COUNTY "AIRPORT SURFACES OVERLAY ZONE" ADDRESSES ZONING RESTRICTIONS WITHIN THE FAR PART 77 IMAGINARY SURFACES (REFERENCED FROM THE 2004 AIRSPACE PLAN).
 - TERPS (INSTRUMENT) DEPARTURE SURFACES DEPICTED FOR BOTH RUNWAY ENDS BASED ON FUTURE INSTRUMENT CAPABILITIES (DEPARTURE ENDS FOR ALL INSTRUMENT RUNWAYS), AS DEFINED IN FAA AC 150/5300-13A AND FAA ORDER 8260.38.
 - FUTURE RUNWAY HIGH POINT (123.03') IS LOCATED AT CURRENT RUNWAY 34 THRESHOLD, WHICH ESTABLISHES AIRPORT ELEVATION.
 - OBSTRUCTION REMOVAL TIMELINE WILL BE DETERMINED BY FUNDING.

 AREAS OF TREE PENETRATION *
 AREAS OF TERRAIN PENETRATION (NONE IDENTIFIED)

FAR PART 77 PLAN VIEW

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 TRUE
 MAG
 MAGNETIC DEC. 15° 4' EAST (2017 VALUE)
 0' 2000' 4000'
 Scale: 1"=2000'

NO.	DATE	BY	APPR	REVISIONS

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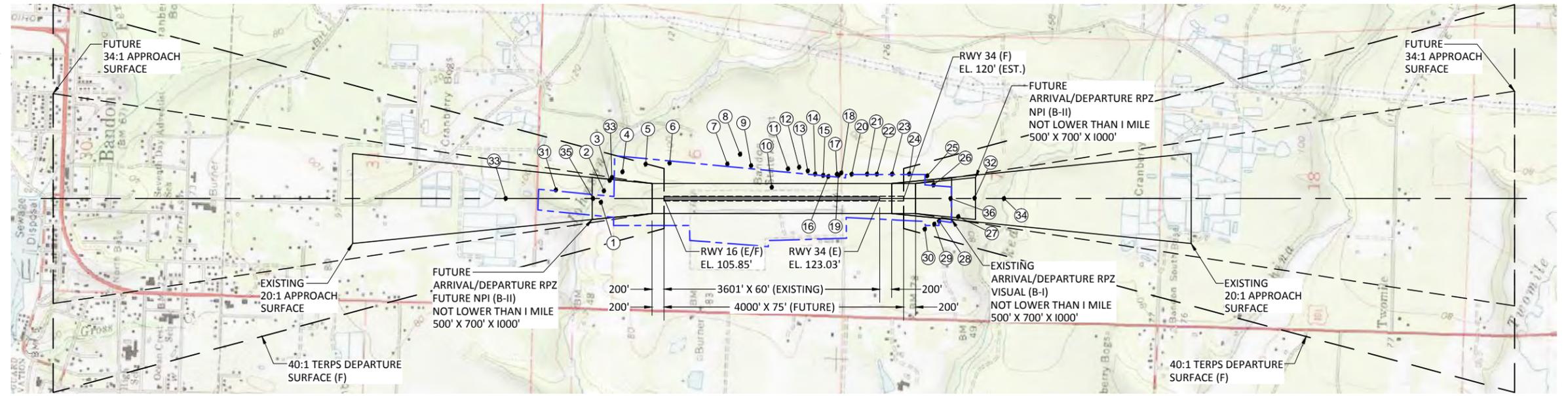
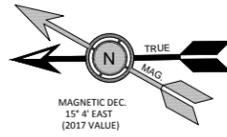
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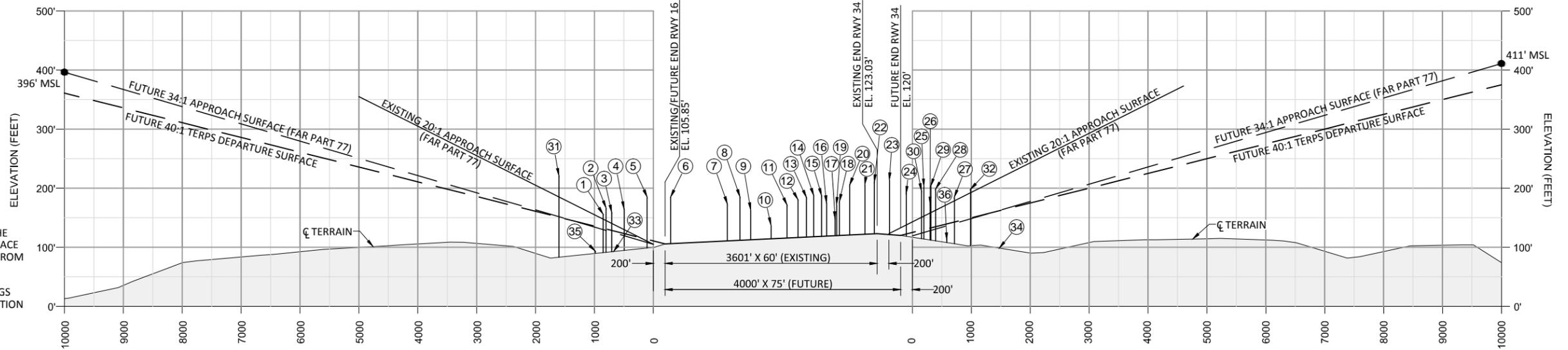
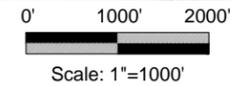
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DATE: MAY 2017	PROJECT NO: 40097050.01		

BANDON STATE AIRPORT
 FAR PART 77 AIRSPACE PLAN 1-2

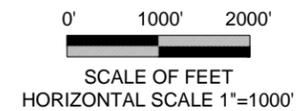
FIGURE NO. -
 SHEET NO. 5 OF 12



RUNWAY 16-34 PLAN VIEW



RUNWAY 16-34 PROFILE VIEW



NOTES:

- DISTANCES FOR NOTED OBSTRUCTIONS ARE BASED ON THE FUTURE RUNWAY CONFIGURATION AND ULTIMATE AIRSPACE CONFIGURATION. DIMENSIONS INCLUDE 200' DISTANCE FROM RUNWAY END TO BEGINNING OF APPROACH.
- OBSTRUCTIONS INFORMATION WAS OBTAINED FROM USGS QUAD MAPS, AIRPORT MANAGEMENT, AND AN OBSTRUCTION SURVEY (REFERENCED FROM THE 2004 AIRSPACE PLAN).
- THE FOLLOWING HEIGHTS WERE ADDED TO THE SURFACE ELEVATION FOR CERTAIN GROUND FEATURES:
 10' FOR A PRIVATE ROAD
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 17' FOR AN INTERSTATE ROAD
 23' FOR RAILROAD TRACKS
- ALL ELEVATIONS ARE ON THE NAVD 88 DATUM, WITH THE EXCEPTION OF THE USGS MAP, WHICH IS NGVD 29 (REFERENCED FROM THE 2004 AIRSPACE PLAN).
- COOS COUNTY "AIRPORT SURFACES OVERLAY ZONE" ADDRESSES ZONING RESTRICTIONS WITHIN THE FAR PART 77 IMAGINARY SURFACES (REFERENCED FROM THE 2004 AIRSPACE PLAN).
- OBSTRUCTION REMOVAL TIMELINE WILL BE DETERMINED BY FUNDING.

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OBSTRUCTION CHART

NO.	ITEM	PART 77 SURFACE	MSL ELEV (EST.)	DISTANCE FROM RWY CL	DISTANCE FROM RWY END	AMOUNT OF PENETRATION (ESTIMATED)	AIRPORT PROPERTY	DISPOSITION
1	TREES	RUNWAY 16 APPROACH (34:1)	155.9'	60' R	1052'	26'	YES	REMOVE
2	TREES	RUNWAY 16 APPROACH (34:1)	166.5'	129' L	1003'	38.1'	NO	REMOVE
3	TREES	RUNWAY 16 APPROACH (34:1)	158.8'	304' L	906'	33.2'	NO	REMOVE
4	TREES	7:1 TRANSITIONAL SURFACE	164.7'	446' L	695'	14.7'	YES	REMOVE
5	TREES	7:1 TRANSITIONAL SURFACE	185.2'	305' L	305'	31.2'	YES	REMOVE
6	TREES	7:1 TRANSITIONAL SURFACE	185'	592' L	-94'	31'	YES	REMOVE
7	TREE	7:1 TRANSITIONAL SURFACE	173.3'	575' L	-1058'	17.3'	NO	REMOVE
8	TREE	7:1 TRANSITIONAL SURFACE	185.3'	738' L	-1271'	5.3'	NO	REMOVE
9	TREE	7:1 TRANSITIONAL SURFACE	163'	548' L	-1454'	9'	NO	REMOVE
10	LIGHTED WIND CONE	PRIMARY SURFACE	137.5'	188' L	-1799'	23.5'	YES	FRANGIBLE NAVALID; NO ACTION
11	TREES	7:1 TRANSITIONAL SURFACE	171.7'	495' R	-1929'	22.7'	NO	REMOVE
12	TREES	7:1 TRANSITIONAL SURFACE	180.9'	522' R	-1744'	26.9'	NO	REMOVE
13	TREES	7:1 TRANSITIONAL SURFACE	184.3'	461' R	-1599'	38.3'	NO	REMOVE
14	TREES	7:1 TRANSITIONAL SURFACE	187.5'	409' R	-1476'	48.5'	NO	REMOVE
15	TREES	7:1 TRANSITIONAL SURFACE	187.3'	387' R	-1342'	51.3'	NO	REMOVE
16	TREES	7:1 TRANSITIONAL SURFACE	174.8'	369' R	-1258'	40.8'	YES	REMOVE
17	TREES	7:1 TRANSITIONAL SURFACE	148'	406' R	-1113'	7.8'	NO	REMOVE
18	TREES	7:1 TRANSITIONAL SURFACE	177'	428' R	-1041'	34.3'	NO	REMOVE

OBSTRUCTION CHART

NO.	ITEM	PART 77 SURFACE	MSL ELEV (EST.)	DISTANCE FROM RWY CL	DISTANCE FROM RWY END	AMOUNT OF PENETRATION (ESTIMATED)	AIRPORT PROPERTY	DISPOSITION
19	TREES	7:1 TRANSITIONAL SURFACE	172'	386' R	-1088'	34.9'	NO	REMOVE
20	TREES	7:1 TRANSITIONAL SURFACE	205'	407' R	-866'	64.3'	NO	REMOVE
21	TREES	7:1 TRANSITIONAL SURFACE	206'	408' R	-608'	63.9'	NO	REMOVE
22	TREES	7:1 TRANSITIONAL SURFACE	210'	409' R	-446'	67.4'	NO	REMOVE
23	TREES	7:1 TRANSITIONAL SURFACE	214'	410' R	-191.5'	69.7'	NO	REMOVE
24	TREES	7:1 TRANSITIONAL SURFACE	191'	412' R	95'	35.6'	NO	REMOVE
25	TREES	7:1 TRANSITIONAL SURFACE	203'	379' R	393'	42.1'	YES	REMOVE
26	TREES	RUNWAY 34 APPROACH (34:1)	172'	226' R	501'	44'	YES	REMOVE
27	TREES	RUNWAY 34 APPROACH (34:1)	185'	301' L	912'	44.2'	NO	REMOVE
28	TREES	7:1 TRANSITIONAL SURFACE	199'	377' L	594'	28.7'	NO	REMOVE
29	TREES	7:1 TRANSITIONAL SURFACE	203'	427' L	512'	29.4'	YES	REMOVE
30	TREES	7:1 TRANSITIONAL SURFACE	195'	508' L	354'	15.3'	NO	REMOVE
31	TREES	RUNWAY 34 APPROACH (34:1)	221'	144' L	1804'	69.2'	NO	REMOVE
32	TREES	RUNWAY 34 APPROACH (34:1)	198'	8' R	1185'	49.7'	NO	REMOVE
33	JOHNSON CREEK	RUNWAY 16 APPROACH (34:1)	72'	351' L	871'	0'	NO	NO OBSTRUCTION - FOR REFERENCE
34	CROOKED CREEK	RUNWAY 34 APPROACH (34:1)	67'	0'	1676'	0'	NO	NO OBSTRUCTION - FOR REFERENCE
35	FENCE	RUNWAY 16 APPROACH (34:1)	76'	0'	1186'	0'	YES	NO OBSTRUCTION - FOR REFERENCE
36	FENCE	RUNWAY 34 APPROACH (34:1)	112'	0'	783'	0'	YES	NO OBSTRUCTION - FOR REFERENCE

NO.	DATE	BY	APPR	REVISIONS

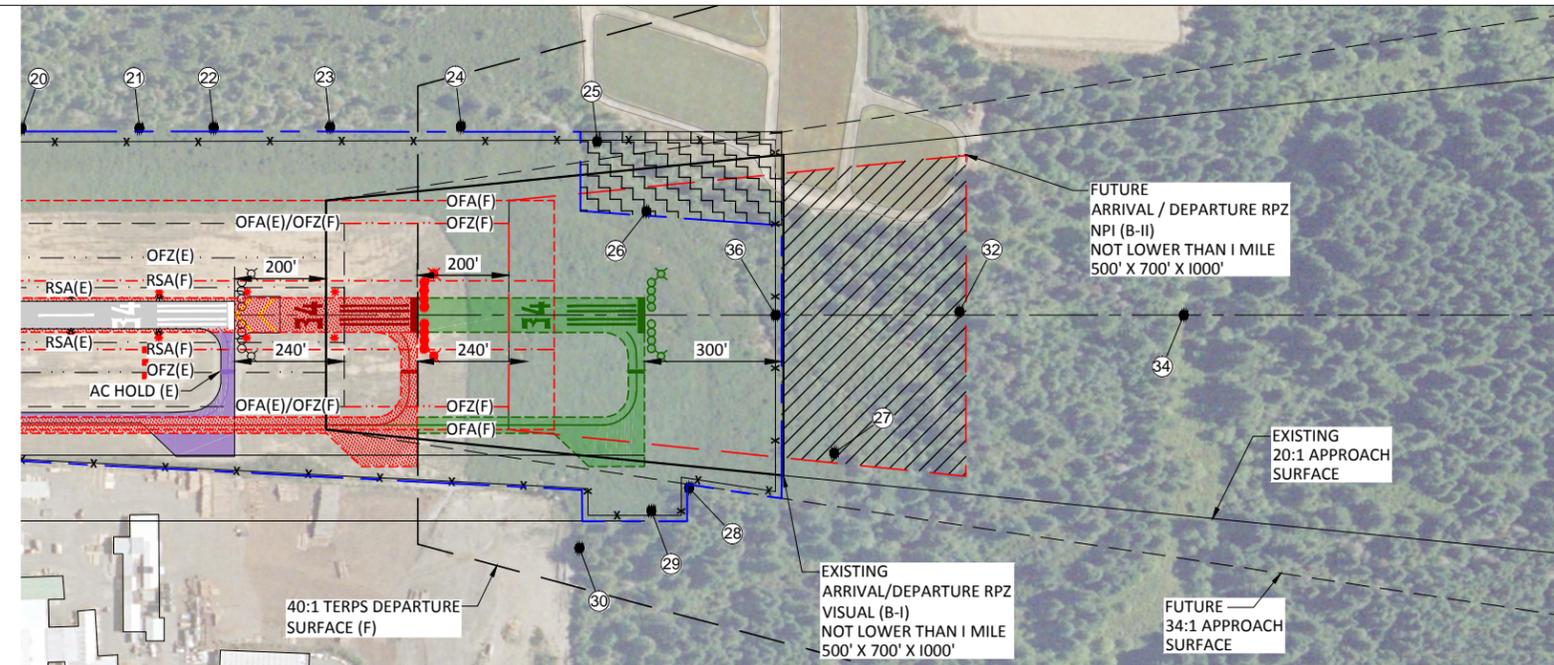
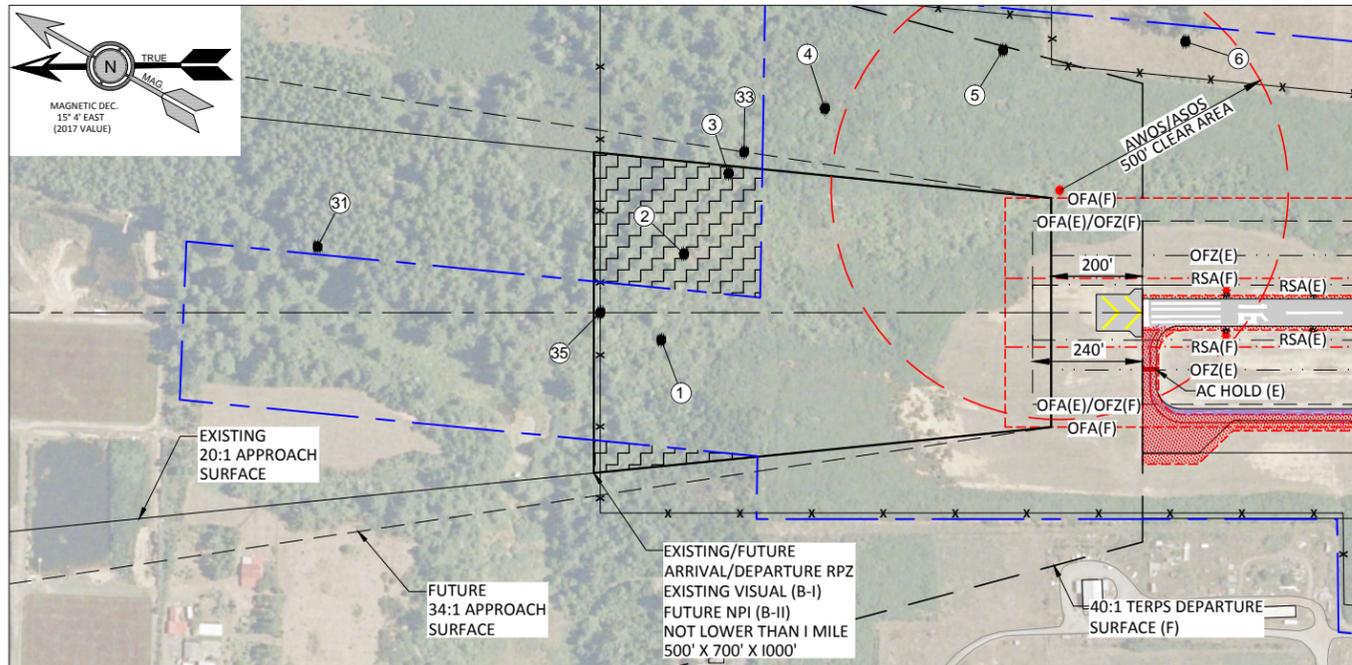
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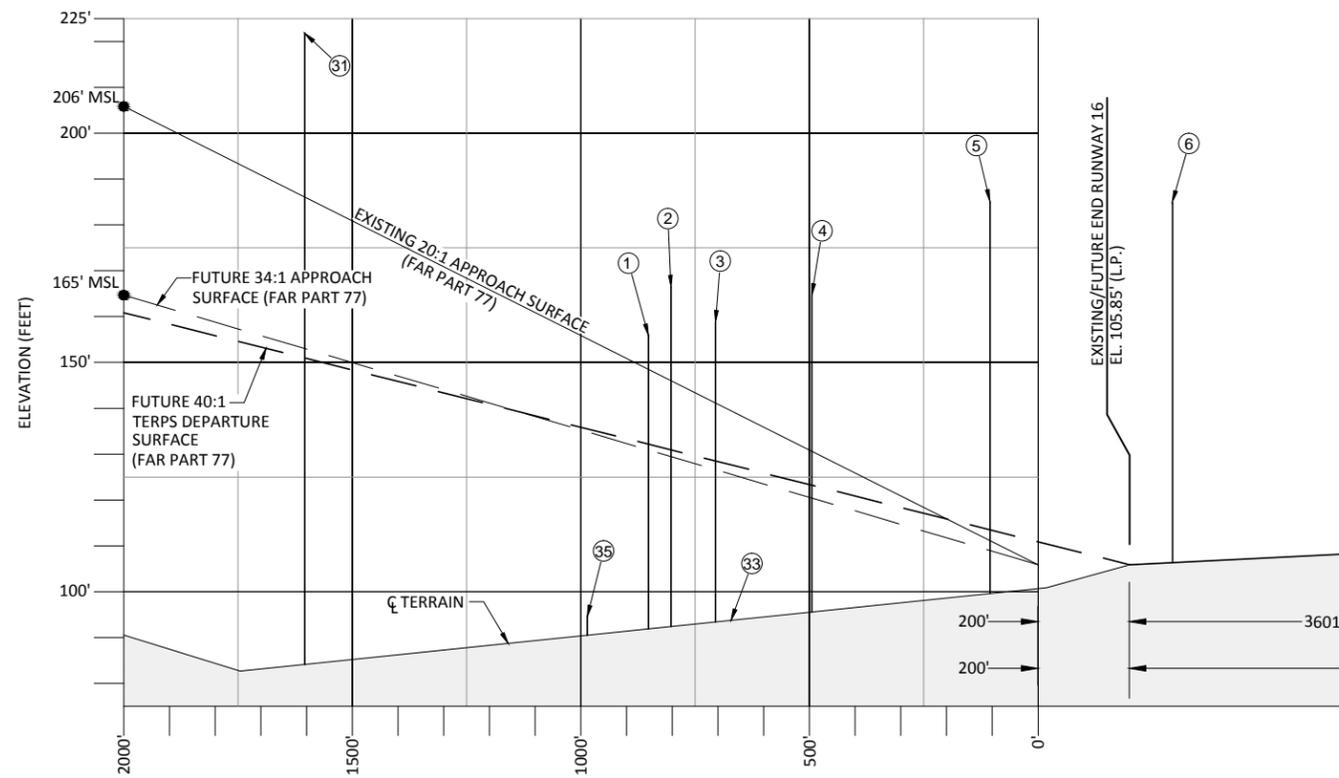
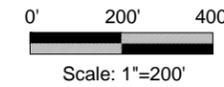
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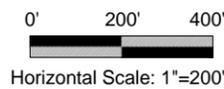
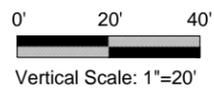
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 CHECKED BY: WMR
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 DATE: MAY 2017
 PROJECT NO: 40097050.01



RUNWAY 16-34 PLAN VIEW



RUNWAY 16-34 PROFILE VIEW



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- NOTES:
- SEE SHEET 6 OF 12 FOR FULL LIST OF OBSTRUCTIONS.
 - SEE SHEET 3 OF 12 FOR FULL LEGEND

NO.	DATE	BY	APPR	REVISIONS

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APPROVAL DATE: _____

SIGNATURE

CENTURY WEST ENGINEERING

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DESIGNED BY: DM
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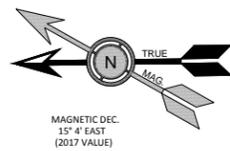
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BANDON STATE AIRPORT

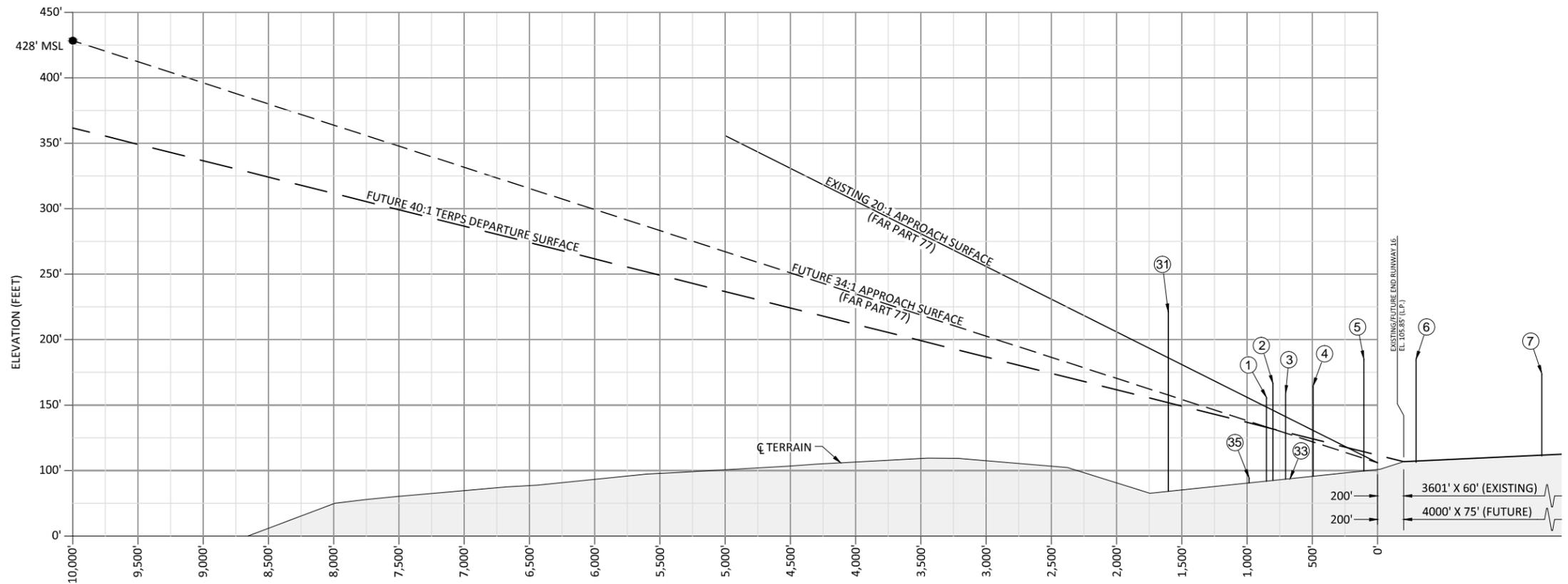
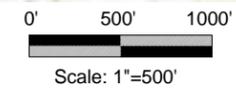
RUNWAY 16/34 INNER APPROACH SURFACE/RPZ

FIGURE NO. -

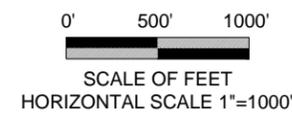
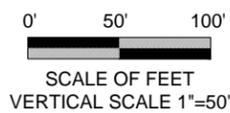
SHEET NO. 7 OF 12



RUNWAY 16 PLAN VIEW



RUNWAY 16 PROFILE VIEW



- NOTES:**
- SEE SHEET 6 OF 12 FOR FULL LIST OF OBSTRUCTIONS.
 - SEE SHEET 3 OF 12 FOR FULL LEGEND

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 APPROVAL
 APPROVAL DATE: _____

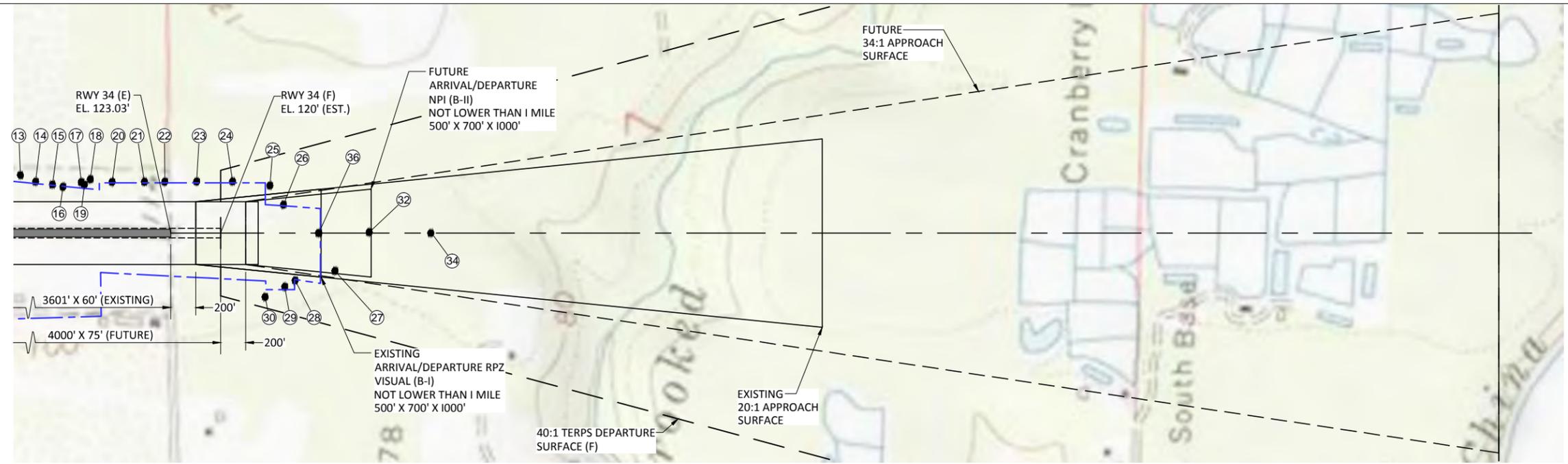
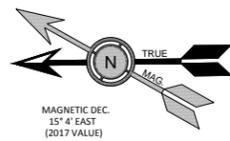
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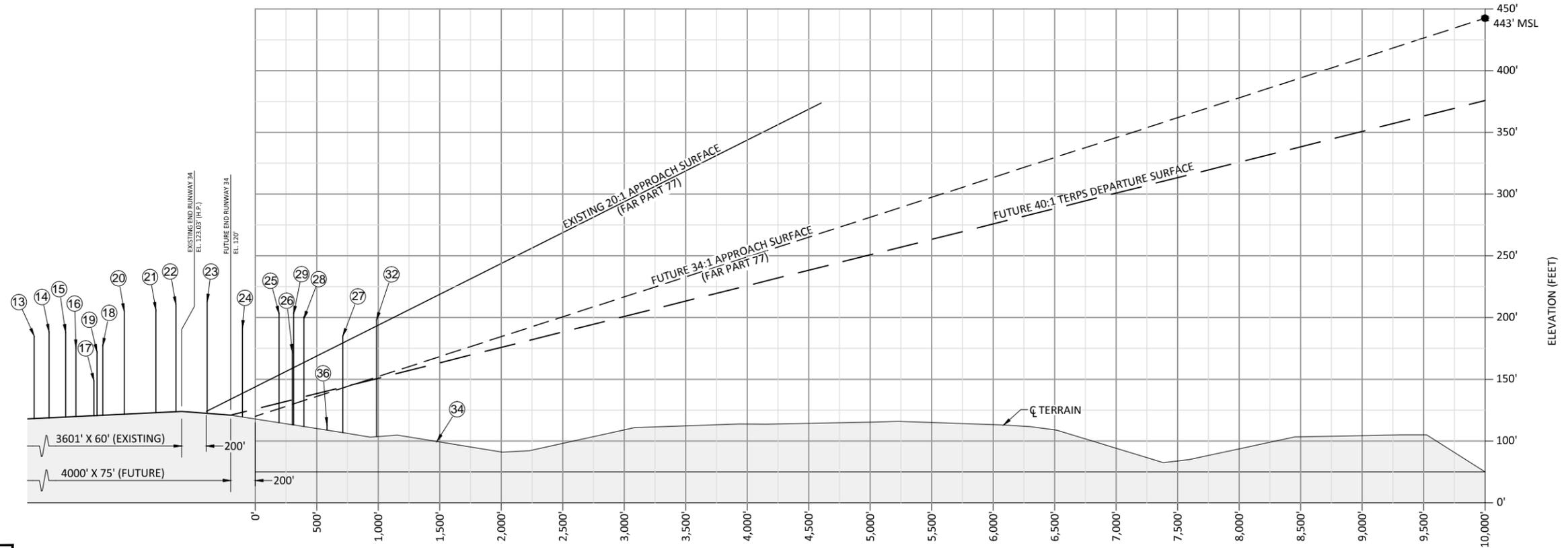
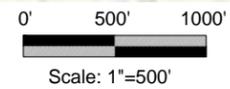
DESIGNED BY: DM	DRAWN BY: JLS	CHECKED BY: WMR	SCALE: AS SHOWN
DATE: MAY 2017	PROJECT NO: 40097050.01		

BANDON STATE AIRPORT
RUNWAY 16 APPROACH SURFACE
PLAN AND PROFILE

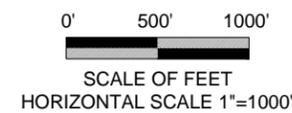
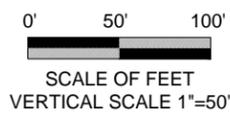
FIGURE NO. -
 SHEET NO. 8 OF 12



RUNWAY 16 PLAN VIEW



RUNWAY 16 PROFILE VIEW



- NOTES:**
 1. SEE SHEET 6 OF 12 FOR FULL LIST OF OBSTRUCTIONS.
 2. SEE SHEET 3 OF 12 FOR FULL LEGEND

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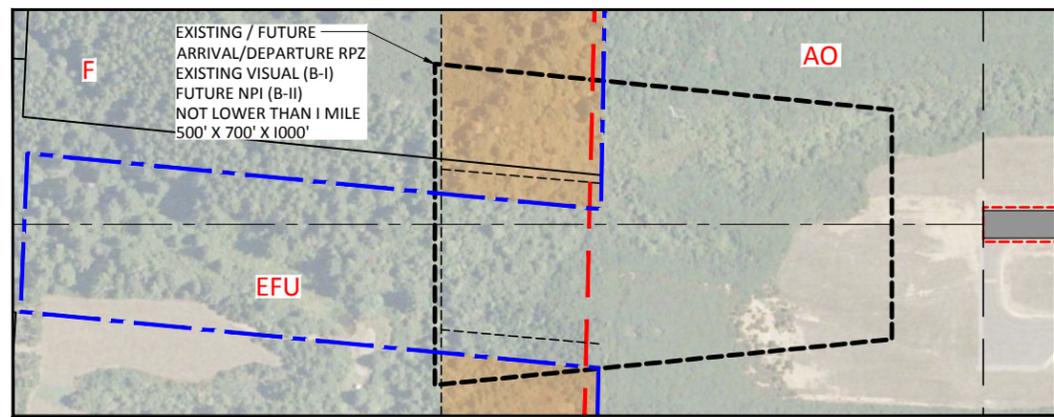
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BANDON STATE AIRPORT
RUNWAY 34 APPROACH SURFACE
PLAN AND PROFILE

FIGURE NO. -
 SHEET NO. 9 OF 12



NORTH PROPERTY DETAIL

Scale: 1"=200'

LAND USE, ZONING, HEIGHT RESTRICTIONS, & ORDINANCES	
DATE	DESCRIPTION
JAN 1, 1986	COOS COUNTY ZONING AND LAND DEVELOPMENT ORDINANCE SECTION 4-6.300 AND 4-1.100, "AIRPORT SURFACE OVERLAY ZONE" AND "AIRPORT OPERATIONS ZONE."

NOTE:

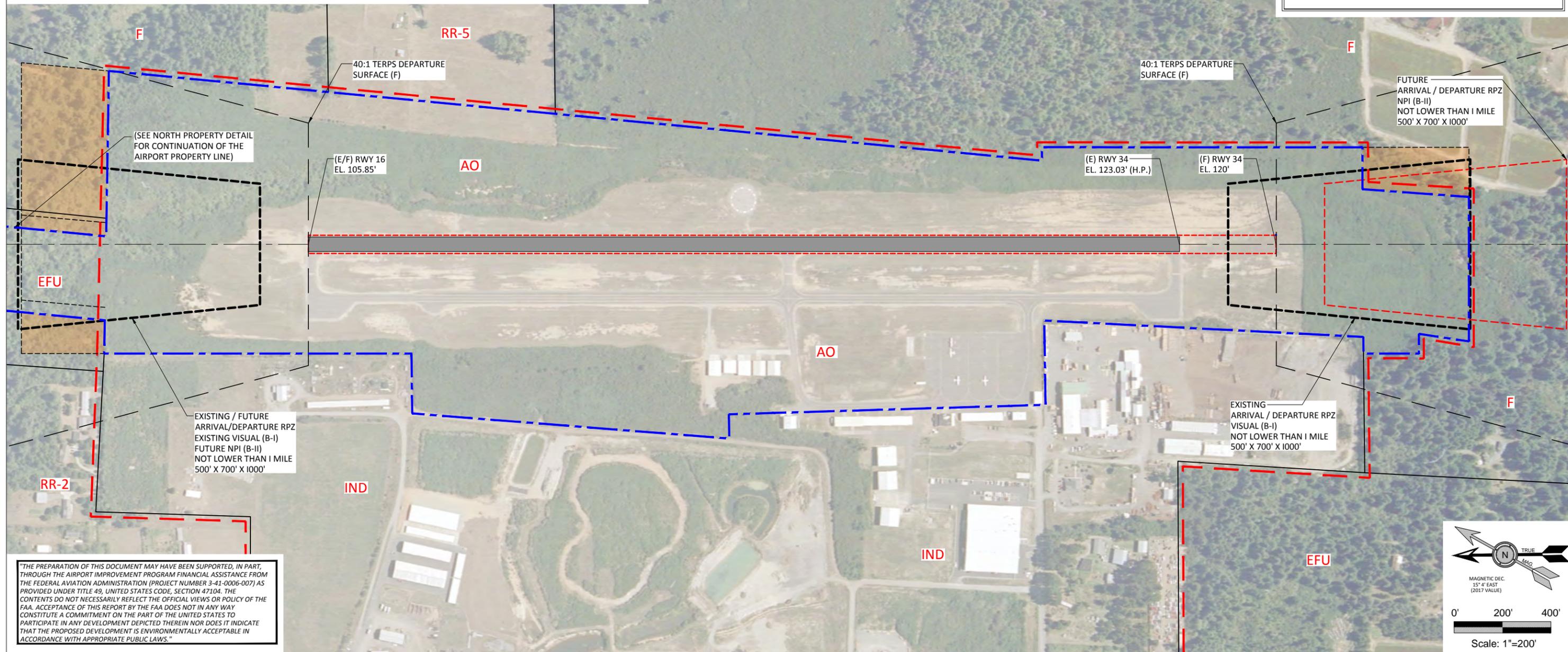
1. THERE ARE NO FLOOD PLAINS WITHIN AIRPORT PROPERTY.

LEGEND

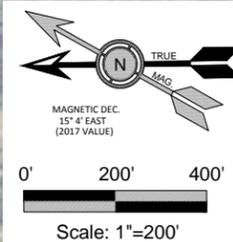
- ZONING BOUNDARY
- RUNWAY PROTECTION ZONE (EXISTING)
- RUNWAY PROTECTION ZONE (FUTURE)
- TERPS SURFACE
- AIRPORT PROPERTY LINE (EXISTING)
- URBAN GROWTH BOUNDARY (CITY OF BANDON)
- EASEMENT

COOS COUNTY ZONING

- AO** AIRPORT OPERATIONS
- EFU** EXCLUSIVE AGRICULTURE
- F** FOREST
- IND** INDUSTRIAL
- RR-5** RESIDENTIAL-LARGE ACREAGE HOMESITES



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BANDON STATE AIRPORT
ON-AIRPORT LAND USE PLAN

FIGURE NO. -
SHEET NO. 10 OF 12

LEGEND

	ZONING BOUNDARY	IND	INDUSTRIAL	AG	AGRICULTURE	RR	RURAL RESIDENTIAL
	AIRPORT TRAFFIC PATTERN (TYP.)	EFU	EXCLUSIVE AGRICULTURE	F	FOREST	C	COMMERCIAL
	RUNWAY PROTECTION ZONE (EXISTING)	F	FOREST	CITY OF BANDON ZONING			
	RUNWAY PROTECTION ZONE (FUTURE)	AO	AIRPORT OPERATIONS				
	APPROACH SURFACE (EXISTING)	C-1	COMMERCIAL-LIGHT	C2	GENERAL COMMERCIAL		
	APPROACH SURFACE (FUTURE)	RR-2	RESIDENTIAL-SMALL ACREAGE HOMESITES				
	TERPS SURFACE	RR-5	RESIDENTIAL-LARGE ACREAGE HOMESITES				
	AIRPORT PROPERTY LINE (EXISTING)						
	BANDON CITY LIMIT BOUNDARY						
	URBAN GROWTH BOUNDARY (CITY OF BANDON)						
	EASEMENT						
	AIRPORT SURFACES (SUB-ZONES)						

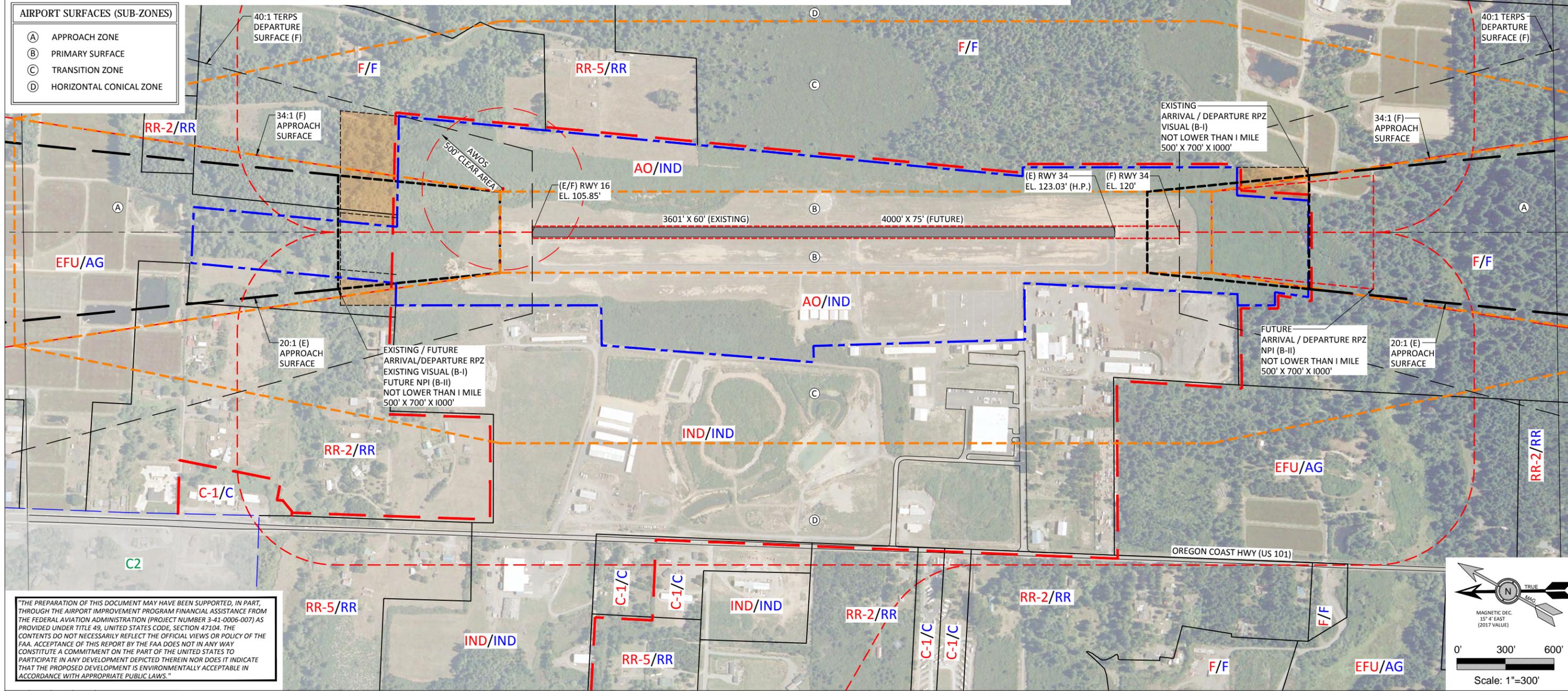
NOTES:

1. THERE ARE NO FLOODPLAINS WITHIN THE AIRPORT PROPERTY.
2. THE AREA SHOWN IS WHOLLY WITHIN COOS COUNTY AND IS OUTSIDE THE LIMITS OF THE CITY OF BANDON.
3. APPROACHES AND DEPARTURES ARE ON A LEFT TRAFFIC PATTERN.
4. AIRPORT PROPERTY IS NOT SUBJECT TO SECTION 303 (L) OF TITLE U.S.C OR 49 SHPO COORDINATION.
5. NO LANDFILLS ARE LOCATED WITHIN 5 MILES OF THE AIRPORT PROPERTY.

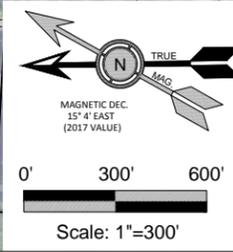
LAND USE, ZONING, HEIGHT RESTRICTIONS, & ORDINANCES	
DATE	DESCRIPTION
JAN 1, 1986	COOS COUNTY ZONING AND LAND DEVELOPMENT ORDINANCE SECTION 4:6.300 AND 4:1.100, "AIRPORT SURFACE OVERLAY ZONE" AND "AIRPORT OPERATIONS ZONE."

AIRPORT SURFACES (SUB-ZONES)

(A)	APPROACH ZONE
(B)	PRIMARY SURFACE
(C)	TRANSITION ZONE
(D)	HORIZONTAL CONICAL ZONE



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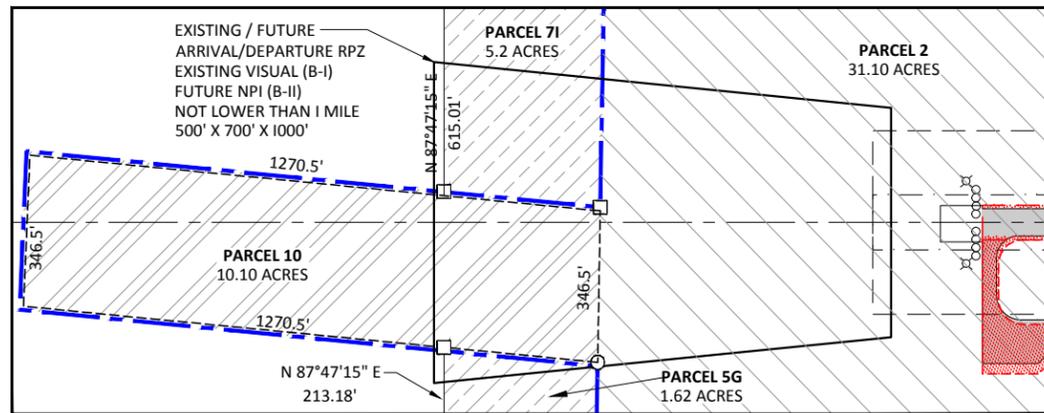
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DATE: MAY 2017	PROJECT NO: 40097050.01		

BANDON STATE AIRPORT
OFF-AIRPORT LAND USE PLAN

FIGURE NO. -
 SHEET NO. 11 OF 12

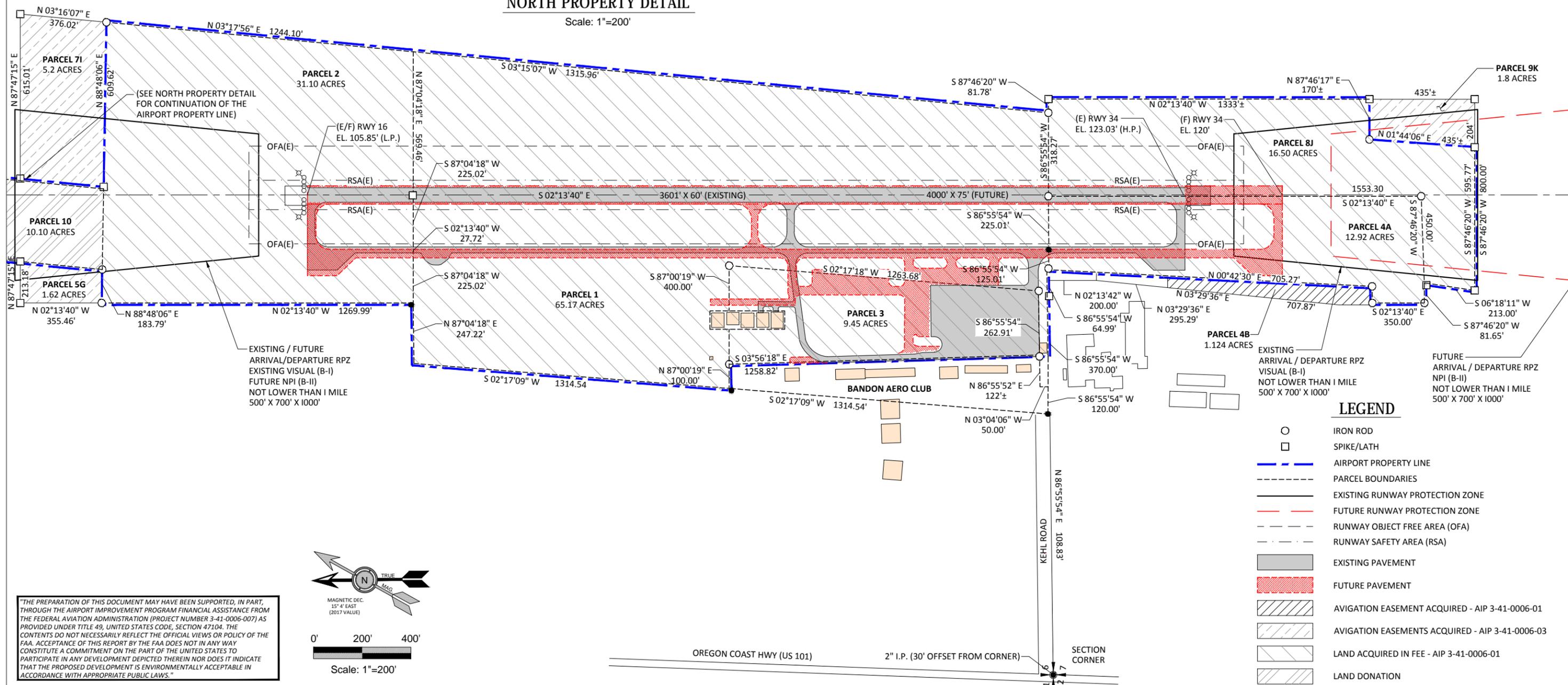
LAND PARCELS	ACRES	RECORDING *		ACQUIRED	
		MICROFILM REEL NUMBER	FED. AGREEMENT #	DATE	INTEREST
1 STATE OF OREGON - AERONAUTICS	65.17	ACQUIRED	NONE	1957	FEE
2 STATE OF OREGON - AERONAUTICS	31.10	90-5-0897	AIP. NO. 3-41-0006-01	1989	FEE
3 STATE OF OREGON - AERONAUTICS	9.45	90-3-1471	AIP. NO. 3-41-0006-01	1989	FEE
4A STATE OF OREGON - AERONAUTICS	12.92	90-4-0156	AIP. NO. 3-41-0006-01	1989	FEE
4B ULRICH LAU	1.124	ACQUIRED	AIP. NO. 3-41-0006-01	1989	EASEMENT
5G MCMAHON FAMILY TRUST	1.62	ACQUIRED	AIP. NO. 3-41-0006-03	1993	EASEMENT
7I JEANNE JANIS	5.20	ACQUIRED	AIP. NO. 3-41-0006-03	1993	EASEMENT
8J STATE OF OREGON - AERONAUTICS	16.50	ACQUIRED	AIP. NO. 3-41-0006-03	1993	FEE
9K ROBINSON LOVING TRUST	1.80	ACQUIRED	AIP. NO. 3-41-0006-03	1993	EASEMENT
10 STATE OF OREGON - AERONAUTICS	10.10	ACQUIRED / DONATED	NONE	2012	FEE

* RECORDS OF COOS COUNTY

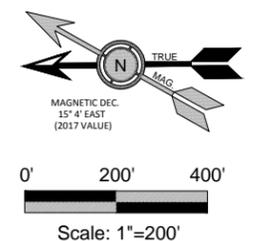


NORTH PROPERTY DETAIL

Scale: 1"=200'



- LEGEND**
- IRON ROD
 - SPIKE/LATH
 - AIRPORT PROPERTY LINE
 - PARCEL BOUNDARIES
 - EXISTING RUNWAY PROTECTION ZONE
 - FUTURE RUNWAY PROTECTION ZONE
 - RUNWAY OBJECT FREE AREA (OFA)
 - RUNWAY SAFETY AREA (RSA)
 - EXISTING PAVEMENT
 - FUTURE PAVEMENT
 - AVIGATION EASEMENT ACQUIRED - AIP 3-41-0006-01
 - AVIGATION EASEMENTS ACQUIRED - AIP 3-41-0006-03
 - LAND ACQUIRED IN FEE - AIP 3-41-0006-01
 - LAND DONATION



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PROJECT NO: 40097050.01

BANDON STATE AIRPORT
EXHIBIT "A" AIRPORT PROPERTY PLAN

FIGURE NO. -
SHEET NO. 12 OF 12

Chapter 9 – Airport Land Use Compatability



Chapter 9 – Airport Land Use Compatibility



Introduction

This chapter describes land use associated with Bandon State Airport and its surroundings, land use controls, Oregon State guidance for land use compatibility planning, protection of airports, and jurisdictional responsibilities.

Government Roles in Airport Land Use

FEDERAL

The Federal Aviation Administration (FAA) discourages incompatible land use in the vicinity of airports, but has no authority to regulate off airport land use. Land use regulation, including comprehensive planning, zoning, and the issuance of building or other development permits is a local responsibility. The FAA has a technical advisory role (development review) based on its interest in protecting the airspace associated with an airport as part of the national airspace system. It is noted that the FAA approach to land use compatibility is based primarily on safety (hazards, obstructions to protected airspace, etc.), but relies on local jurisdictions to determine appropriate land uses and development densities in the vicinity of airports.

The FAA effectively regulates on-airport land use through approval of the Airport Layout Plan (ALP) and requiring compliance with FAA Airport Improvement Program (AIP) grant assurances for federally-obligated airports. For land use, the grant assurances require sponsors to take measures to maintain airport land use compatibility and protect the aeronautical function of an airport by restricting the location of non-aviation land uses. It is recognized however, that airport sponsors do not necessarily control land use

regulation for areas surrounding their airport. It is common to have multiple jurisdictions in close proximity, including cities and counties, and cases where airport owners have no local land use authority (e.g., port districts, state airport agencies, etc.).

Under **14 Code of Federal Regulations (CFR), Part 77**, the FAA has the authority to review proposed construction through its 7460-1 (Notice of Proposed Construction or Alteration) process. The FAA review addresses compatibility for both on and off airport based on the potential for creating a “hazard to air navigation” associated with obstructions/penetrations in defined airspace. FAA airspace reviews include **FAR Part 77** surfaces; Terminal Instrument Procedures (TERPS) surfaces, visual runway traffic patterns, and visual navigation aid (e.g., VASI, PAPI, etc.) protected airspace. When a proposed structure significantly penetrates navigable airspace, the FAA will issue a letter objecting to the proposed action (determination of presumed hazard to air navigation) for the consideration of local authorities. When proposed actions do not present a hazard to air navigation, a “no objection” finding is issued. It is important to note that this analysis is based on an obstruction evaluation and is not intended to address general land use compatibility in terms of noise exposure or proximity to an airport or runway, assuming no conflict exists with applicable airport design standards. The FAA recommends that local jurisdictions include the following language in their development codes: *“Nothing in this chapter shall diminish the responsibility of project proponents to submit a Notice of Construction or Alteration to the Federal Aviation Administration if required in accordance with FAR Part 77, Objects Affecting Navigable Airspace.”*

FAR Part 150, Airport Noise Compatibility Planning provides guidance for land use compatibility around airports. The 1990 Airport Noise and Capacity Act (ANCA), defines the federal policy on the regulation of airport noise (operating curfews, aircraft restrictions, etc.), with the intent of standardizing noise controls throughout the national system.

STATE

The State of Oregon has created a set of **Oregon Administrative Rules (OAR)**, contained in **Chapter 660, Department of Land Conservation and Development; Division 12, Transportation Planning and Division 13, Airport Planning** to address airport protection and function. Local government shall follow State rules as described in **OAR 660** for planning and managing public-use airports. Division 12 states that local governments shall participate and develop a Transportation System Plan with “measures to protect public use airports by controlling land uses within airport noise corridors and imaginary surfaces, and by limiting physical hazards to air navigation.” **Division 13** states, *“the policy of the State of Oregon is to encourage and support the continued operation and vitality of Oregon’s airports.”* It includes “rules that are intended to promote a convenient and economic system of airports in the State and for land use planning to reduce risks to aircraft operations and nearby land uses.” A summary of these requirements is provided below:

- **660-013-0030 Preparation and Coordination of Aviation Plans** states “A city or county with planning authority for one or more airports, or areas within safety zones or compatibility zones described in this division, shall adopt comprehensive plan and land use regulations for airports consistent with the requirements of this division and ORS 836.600 through 836.630.”
- **660-013-0040 Aviation Facility Planning Requirements** provides a list of planning requirements including a map showing location of airport boundary, a map or description of existing and planned facilities, a projection of future aeronautical needs, etc.
- **660-013-0070 Local Government Safety Zones for Imaginary Surfaces** specifies that “local governments shall adopt an Airport Safety Overlay Zone to promote aviation safety by prohibiting structures, trees and other objects of natural growth from penetrating airport imaginary surfaces.”
- **660-13-0080 Local Government Land Use Compatibility Requirements for Public Use Airports** provides a list of requirements including prohibiting new residential development and public assemble uses within the Runway Protection Zone (RPZ) and limits establishment of uses within the noise impact boundary.
- **660-013-0100 Airport Uses at Non-Towered Airports** requires local government to adopt land use regulations that authorize a range of defined airport uses within the airport boundary of non-towered airports.
- **660-013-0140 Safe Harbors** defines “safe harbor” requirements that maybe used by local government to rely of existing comprehensive plans land use regulations, Airport Master Plans and Airport Layout Plans.
- **660-013-155 Planning Requirements for Small Airports** specifies that airports are to be subject to the planning and zoning requirements within ORS 836.

Division 13 implements **Oregon Revised Statutes (ORS) 836.600** through **836.630**, which promotes land use planning to reduce unnecessary risk to aircraft operations. Several key statutes that are important in land use planning are summarized below:

- **836.608 Airport operation as matter of state concern (local planning documents to recognize airport location, limitations on use and expansion of facility)** requires local governments to recognize airport locations within planning documents. It also establishes limitations on use and a process in which airports can add new land uses on their property.

- **836.610 Local government land use plans and regulations to accommodate airport zone and uses (funding; rules)** requires local governments to amend their land use regulations and comprehensive plans in accordance to 836.616 and 836.619.
- **836.616 Rules for airport uses and activities** identifies types of permitted land uses and activities on airport property and requires local government to meet standards for safe land uses near airports.
- **836.623 Local compatibility and safety requirements more stringent than state requirements (criteria, water impoundments, report to federal agency, and application to certain activities)** allows local governments to adopt land use compatibility and safety requirements that are more stringent than the minimum required by Land Conservation and Development Commission rules. It provides rules which limit the size of water impoundments near airports in an effort to reduce wildlife attractants.

LOCAL LAND USE AUTHORITY

Establishing compatible land uses around airports is the responsibility of local governing agencies with planning and zoning authority. The FAA and airport management (ODA) may provide recommendations on land use issues, while discouraging incompatible land uses around airports.

Coos County has land use authority for Bandon State Airport and its immediate surroundings. The airport is located outside Bandon's city limits, but within Bandon's Urban Growth Boundary (UGB). Coos County and the City of Bandon have established airport overlay zoning to ensure long-term land use compatibility with the airport.

However, it does not appear that the city and county have established a formal consultation process for coordinated review of proposed development, zoning changes, or approval of conditional uses in the vicinity of the airport, or within the Bandon UGB. A coordinated review process is recommended, particularly within the Bandon UGB, to ensure consistency in local land use.

Comprehensive Plan Land Use Designations

A comprehensive plan is a policy document which defines local priorities and guides long term growth and development, consistent with state law.

COOS COUNTY

Coos County's comprehensive plan land use designation for Bandon State Airport is Industrial. The Industrial *"designation applies to sites potentially needed for industrial development. Use of the designation is not restricted to urban growth areas."*

Coos County’s Comprehensive Plan acknowledges that improvements to Bandon State Airport would increase the airports importance as a valuable economic resource to the county’s transportation system. Coos County’s transportation goal is to *“strive to provide and encourage a transportation system that promotes safety and convenience for citizens and travelers and that strengthens the local and regional economy by facilitating the flow of goods and services.”*

Coos County’s transportation goal contains strategies for Bandon State Airport, which include:¹

- **Strategy 8-** *“Coos County shall cooperate with the City of Bandon and the State of Oregon Aeronautics Division in ensuring that the Bandon State Airport meets Federal Aviation Administration Planning Grant conditions regarding airport safety and compatibility.”*

“This strategy shall be implemented by adopting an “Airport Operations” zone for the property encompassing the Bandon State Airport boundaries and the “Primary and Secondary Safety Zones,”... the AO zone shall restrict activities to those that are airport-related and shall be designed to limit the height of structures in the zone to promote safe aircraft operations.”

- **Strategy 11-** *“Coos County shall cooperate with the Oregon State Aeronautics Division and the Federal Aviation Administration by developing an Airport Surfaces Overlay Zoning District to prevent the creation or establishment of hazards to air navigation. The Overlay Zoning District shall apply to the Bandon, Lakeside and Powers State Airports and shall encompass the primary surface, approach surface, transitional surfaces, horizontal surface and conical surfaces...”*

CITY OF BANDON

The City of Bandon has included policies in their comprehensive plan to protect Bandon State Airport from encroachment or other incompatible land uses. As noted earlier, the airport and the adjacent industrially-zoned parcels are located within the Bandon UGB, which could eventually lead to annexation by the city.

Section I subsection Goal 12-Transportation, provides policies for the city’s transportation system, including those that promote and protect aviation in the region.²

- **Policy 3-** *“It shall be the policy of the city to encourage continued commercial, certificated regional air service to the region.”*
- **Policy 7-** *“It shall be the policy of the city to protect the Bandon State Airport from encroachment by incompatible uses. The land areas at the runway ends shall not be developed.”*

¹ Coos County Comprehensive Plan, Volume 1 Part 1, Chapter 5.19 Transportation (1985)

² City of Bandon Comprehensive Plan, Section I, Transportation (2010)

“The city will coordinate its planning and land use activities with Aeronautics Division and will comply with the Federal Standards for Airports.”

Airport Zoning

Zoning ordinances are the primary implementation tool used in land use planning to ensure consistency between long term (comprehensive planning) and development within a community or county.

COOS COUNTY

Bandon State Airport is zoned “Airport Operations” (AO). The Coos County ordinance provides the following description for the zone: *“The purpose of the Airport Operations ‘AO’ district is to recognize those areas devoted to or most suitable for immediate operational facilities necessary for commercial and non-commercial aviation. It is also intended to provide areas for those activities directly supporting or dependent upon aircraft or air transportation when such activities, in order to function, require a location within or immediately adjacent to primary flight operations and passenger or cargo service facilities. In addition, the ‘AO’ district is intended to provide areas for certain open space uses for airfield grounds maintenance and as a buffer to minimize potential dangers from, and conflicts with, the use of aircraft.”*

The AO zone permits a wide range of aeronautical uses to include air cargo warehousing and distribution; air operation facilities; aero school and club; aero sales; and repair and storage facilities. In addition, the AO zone permits a limited amount of non-aeronautical uses around the airport.³

CITY OF BANDON

As noted earlier, Bandon State Airport is located south of Bandon’s city limits, but within the Urban Growth Boundary (UGB). The City of Bandon Comprehensive Plan provides the following description: *“In 1991, the city modified the Urban Growth Area by adding 129 acres of Industrial zoned property near the airport.”* The *“Bandon Plan suggests light industrial development in the vicinity of the Bandon Airport. Such a classification would pose minimal conflict with adjacent uses and would provide areas suitable for those types of firms, which would derive particular benefit from being located near the airport.”*

The City of Bandon identified the airport area as one of the six locations where industrial land uses are occurring, and made it the third highest priority for boundary expansion through annexation. The city views the airport area as the *“best site for future industrial development”* due to the following site characteristics:⁴

- *Adjacent to Highway 101;*
- *Existing industrial land;*

³ Coos County Zoning and Land Development Ordinance, Chapter IV- Zoning; Article 4.1 Zoning-General, Article 4.2-Uses.

⁴ City of Bandon Comprehensive Plan, Chapter 3 Land Use (1991)

- *Flat, vacant land;*
- *No flood hazard, no known geological hazard;*
- *Buildable land estimated at 130 acres;*
- *Current zoning allows for industrial uses compatible with airport operations; and*
- *No existing or allowed residential uses.*

Airport Vicinity Zoning

COOS COUNTY

Coos County has jurisdiction for the land immediately surrounding the airport; areas located in the Bandon city limits are located north of the airport. The land west of the airport (east of Highway 101) is zoned Industrial (IND). The industrial zoning for this area provides a high degree of land use compatibility with airport operations. Zoning for other nearby areas include Forest (F) and Exclusive Farm Use (EFU); areas of Rural Residential (RR) zoning (typically 2 to 5-acre parcels) are located northwest of the airport and immediately adjacent to the airport near its northeast corner. Areas of Commercial (C-1) and RR zoning are located west of Highway 101, due west of the airport. The current mixture of resource, industrial, commercial and low-density residential zoning provides a reasonable level of land use compatibility for airport operations. Any future zoning changes that could increase the density of nearby residential areas should be carefully considered as it could adversely impact airport operations through a reduced level of land use compatibility.

CITY OF BANDON

The southern edge of Bandon city limits is located approximately .5 miles northwest of the airport at its nearest point, with the primary southern boundary located approximately 2 miles north of the airport. The zoning in the area located nearest the airport (.5 to 1.5 miles northwest of the runway) includes General Commercial (C2), Controlled Development (CD) and Residential (R).

Figure 9-1, located at the end of the chapter, depicts existing zoning in the vicinity of the airport.

Airport Overlay Zones

Coos County and City of Bandon have adopted airport overlay zones that are intended to protect the airspace associated with Bandon State Airport from obstructions. The city and county overlay zones do not share common definitions or geometry which creates the potential for variation in protection, particularly where jurisdictional lines meet.

COOS COUNTY

Coos County established an airport overlay zone designated “Airport Surfaces (AS) Floating” zone to provide special considerations for areas around the airport. *“The purpose of the Airport Surfaces Floating zone is to protect public health, safety and welfare. It is recognized that obstruction to aviation have a potential for endangering the lives and property of users of selected airports, and property of occupant land in the airport’s vicinity; an obstruction may affect future instrument approach minimums; and obstructions may reduce the area available for the landing, take-off and maneuvering of aircraft, thus tending to destroy or impair the utility of the airport and the public investment therein.”*

Coos County created “Airport Sub-Zones” within the Airport Surfaces Floating zone to protect the airspace around Bandon, Lakeside, and Powers State Airports. These sub-zones include an Approach Zone, Transition Zone, Horizontal Conical Zone, and Primary Surface Zone with airport specific dimensions and limitations.⁵

A copy of Coos County’s Airport Surfaces (AS) Floating zone (Section 4.6.300-345) is included in **Appendix C**.

CITY OF BANDON

The City of Bandon created an “Airport Overlay” (AO) zone intended to *“prevent the establishment of airspace obstructions in airport approaches and surrounding area through height restrictions and other land use controls as deemed essential to protect the health, safety and welfare of the people of the City of Bandon and Coos County.”* The Airport Overlay zone applies to the land lying beneath the airport imaginary surfaces for Bandon State Airport.⁶ The zoning ordinance contains limitations to restrict public assembly, glare producing materials, noise sensitive developments, and structures that penetrate Part 77 surfaces.

A copy of the City of Bandon’s Airport Overlay (AO) zone is included in **Appendix D**.

Table 9-1 compares Coos County’s Airport Surfaces Floating Zone and City of Bandon’s Airport Overlay Zone imaginary surface dimensions with FAR Part 77 standards for the existing “Larger than Utility” Visual runway and future “Larger than Utility” Non-Precision runway.

⁵ Coos County Zoning and Land Development Ordinance, *Article 4.6 Overlay Zones* (1985)

⁶ Bandon Municipal Code, Title 17, *Chapter 17.88 Airport Overlay Zone* (2009)

TABLE 9-1: AIRPORT OVERLAY ZONE AND FAR PART 77 IMAGINARY SURFACES COMPARISON

IMAGINARY SURFACES	COOS COUNTY AIRPORT SURFACES FLOATING ZONE	CITY OF BANDON AIRPORT OVERLAY ZONE	FAR PART 77 LARGER THAN UTILITY VISUAL	FAR PART 77 LARGER THAN UTILITY NON-PRECISION
Horizontal Surface	9,000 feet	5,000 feet	5,000 feet	10,000 feet
Conical Surface <ul style="list-style-type: none"> • Slope • Horizontal Distance 	- -	20:1 4,000 feet	20:1 4,000 feet	20:1 4,000 feet
Primary Surface	500 feet	500 feet	500 feet	500 feet
Approach Surface <ul style="list-style-type: none"> • Slope • Width • Horizontal Distance 	- 1,400 feet 3,000 feet	20:1 1,250 feet 5,000 feet	20:1 1,500 feet 5,000 feet	34:1 3,500 feet 10,000 feet
Transitional Surface <ul style="list-style-type: none"> • Slope • Horizontal Distance 	- 1,050 feet	7:1 5,000 feet	7:1 5,000 feet	7:1 10,000 feet

Transportation System Plan

COOS COUNTY

The Coos County Transportation System Plan (TSP) provides goals and objectives with guiding principles for planning and managing Coos County’s transportation system. An essential goal for Coos County airports is to *“protect and enhance airport facilities by developing regulations to reduce hazards and promote compatible land uses in surrounding areas and coordinating with the Oregon Department of Aviation, Southwest Oregon Regional Airport, other regional, local and remote aviation facilities, and affected cities.”*

The “Air Facilities” section of Chapter 3 in the TSP describes the four public use airports operating in Coos County and identifies Bandon State Airport as a Category 4-Community General Aviation Airport.

Chapter 6 of the TSP contains an “Airport Plan,” which incorporates any needed changes and improvements to airport facilities. The Airport Plan states *“conversations with county and city staff suggest that no future access and roadway needs have been identified for these facilities.”*⁷

⁷ Coos County Transportation System Plan (2011)

CITY OF BANDON

The City of Bandon Transportation System Plan (TSP) (Volume 6) establishes how existing plans and implementing measures will need to be revised to carry out the preferred alternative. Section 1 defines the city's transportation goals, objectives and policies for the city limits and urban growth area. The city's transportation goal is *"a transportation system meeting the complete needs of individuals, businesses, and institutions for the transport of people and goods, by multiple means, in a safe, efficient, and economical manner."* The TSP's objectives and policies that apply to Bandon State Airport include:⁸

- Objective 9, *"to protect and enhance the development and operation of the Bandon State Airport."*
- Policy 23, *"the function of the Bandon State Airport shall be protected through the application of appropriate land use designations to assure that future land uses are compatible with continued operation of the airport."*

Section 6 includes an "Airport Plan" describing Bandon State Airport's location and facilities. The Airport Plan states, *"the airport overlay zone in the zoning ordinance applies to any land impacted by the airport. The city's airport overlay zone would be amended, as necessary, to be consistent with the rules and guidance of the State's Aeronautics Division. Bandon will cooperate with Coos County and the state to assure that all development that occurs around the airport is compatible with the functions of the airport."*⁹

Summary and Recommendations

Coos County and the City of Bandon have taken steps to be proactive in ensuring the longevity and continued growth of Bandon State Airport. There are no known incompatible land uses or activities around the airport at this time. Maintaining effective land use controls around the airport will be crucial in protecting the airport and ensuring the long-term aeronautical viability of the site.

The following recommendations and actions are presented for Coos County and City of Bandon consideration:

- Update the existing Coos County Airport Surfaces Floating zone to be consistent with FAR Part 77 Imaginary Surface dimensions and language.
- Ensure effective coordination between Coos County and the City of Bandon in planning and development of the airport and surrounding areas.
- If the airport is annexed into the City of Bandon in the future, creating an airport-specific zone that clearly defines a range of permitted and conditional uses normally associated with general aviation airports is recommended.

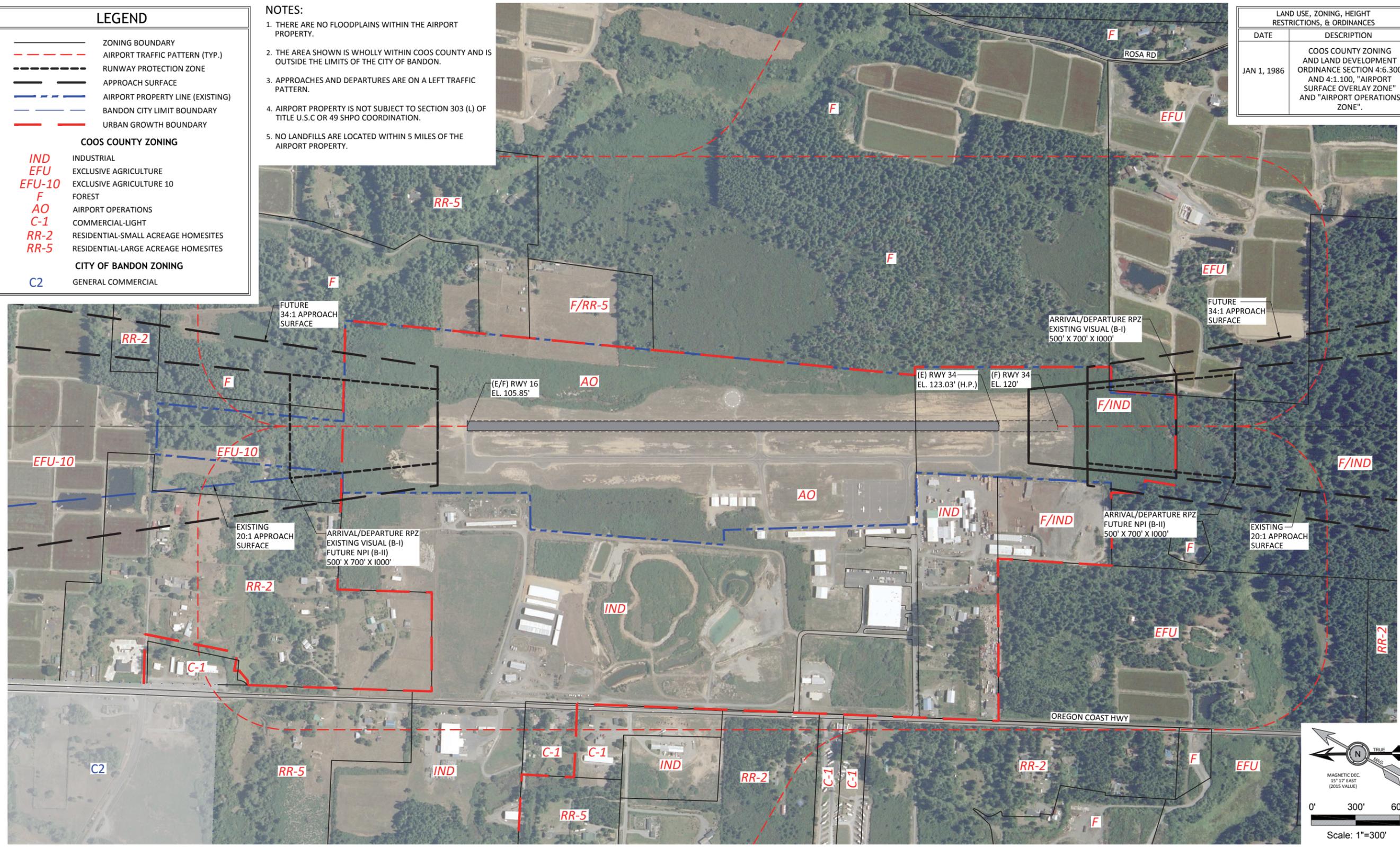
⁸ City of Bandon Transportation System Plan, Volume 6, Section 1 (2000)

⁹ City of Bandon Transportation System Plan, Volume 6, Section 6 (2000)

LEGEND	
	ZONING BOUNDARY
	AIRPORT TRAFFIC PATTERN (TYP.)
	RUNWAY PROTECTION ZONE
	APPROACH SURFACE
	AIRPORT PROPERTY LINE (EXISTING)
	BANDON CITY LIMIT BOUNDARY
	URBAN GROWTH BOUNDARY
COOS COUNTY ZONING	
IND	INDUSTRIAL
EFU	EXCLUSIVE AGRICULTURE
EFU-10	EXCLUSIVE AGRICULTURE 10
F	FOREST
AO	AIRPORT OPERATIONS
C-1	COMMERCIAL-LIGHT
RR-2	RESIDENTIAL-SMALL ACREAGE HOMESITES
RR-5	RESIDENTIAL-LARGE ACREAGE HOMESITES
CITY OF BANDON ZONING	
C2	GENERAL COMMERCIAL

- NOTES:**
1. THERE ARE NO FLOODPLAINS WITHIN THE AIRPORT PROPERTY.
 2. THE AREA SHOWN IS WHOLLY WITHIN COOS COUNTY AND IS OUTSIDE THE LIMITS OF THE CITY OF BANDON.
 3. APPROACHES AND DEPARTURES ARE ON A LEFT TRAFFIC PATTERN.
 4. AIRPORT PROPERTY IS NOT SUBJECT TO SECTION 303 (L) OF TITLE U.S.C OR 49 SHPO COORDINATION.
 5. NO LANDFILLS ARE LOCATED WITHIN 5 MILES OF THE AIRPORT PROPERTY.

LAND USE, ZONING, HEIGHT RESTRICTIONS, & ORDINANCES	
DATE	DESCRIPTION
JAN 1, 1986	COOS COUNTY ZONING AND LAND DEVELOPMENT ORDINANCE SECTION 4:6.300 AND 4:1.100, "AIRPORT SURFACE OVERLAY ZONE" AND "AIRPORT OPERATIONS ZONE".



Chapter 10 – Planning for Compliance & Solid Waste Recycling Plan



Chapter 10 – Planning for Compliance & Solid Waste Recycling Plan



Introduction

This chapter discusses the elements associated with the operation and management of Bandon State Airport, as a federally-obligated airport. The Federal Aviation Administration (FAA) encourages airport sponsors to establish and implement programs that promote sound operating practices and ongoing compliance with regulatory requirements. The FAA currently recommends that compliance be addressed during the airport planning process through the review of airport plans and documents including: the approved Airport Layout Plan, Exhibit "A" Property Map, any airport ordinance, any applicable zoning ordinance, airport rules and regulations, airport minimum standards, airport budgets, leases, easements, permits, and other documents.

Oregon Department of Aviation Compliance

Oregon Department of Aviation (ODA) maintains a high degree of control over the operation of Bandon State Airport. ODA meets all applicable financial reporting and record keeping requirements. They employ a variety of "best practices" including: periodic review of market rates and fees, land appraisals, formal procurement and contracting practices, coordination with adjacent land owners (Avigation easements), local government (land use planning, zoning), state government (airport overlay zoning, environmental agencies, etc.), and tribal government.

ODA has one existing Ingress/Egress agreement commonly referred to as a "Through-the-Fence" (TTF) agreement in place with Bandon Aero Club, Inc. This agreement includes four conventional hangars, one

fixed base operator and maintenance hangar, one double-sided T-hangar, one single-sided multi-unit hangar, and one pilot lounge, located on the west side of the airport adjacent to the main apron. A section on FAA TTF Compliance is provided later in this chapter. There are no known compliance issues associated with airport development, tenant leases, land leases, or other items.

FAA Compliance Summary

A management program based on the FAA's "Planning for Compliance" guidelines and the adoption of airport management "Best Practices" is recommended to address FAA compliance requirements and avoid noncompliance, which could have significant consequences.

Airport management "Best Practices" are developed to provide timely information and guidance related to good management practices and safe airport operations for airport managers and sponsors. The practices outlined herein are designed for use by ODA for evaluating and improving their current and future operation and management program.

Airport sponsors must comply with various federal obligations through agreements and/or property conveyances, outlined in **FAA Order 5190.6B**, Airport Compliance Manual. The contractual federal obligations that a sponsor accepts when receiving federal grant funds or transfer of federal property can be found in a variety of documents including:

- Grant agreements issued under the Federal Airport Act of 1946, the Airport and Airway Development Act of 1970, and Airport Improvement Act of 1982. Included in these agreements are the requirement for airport sponsors to comply with:
 - Grant Assurances
 - Advisory Circulars
 - Application commitments
 - FAR procedures and submittals
 - Special conditions
- Surplus airport property instruments of transfer;
- Deeds of conveyance;
- Commitments in environmental documents prepared in accordance with FAA requirements;
- Separate written requirements between a sponsor and the FAA.

Land use compliance and compatible land use planning is often a significant compliance issue for airports. Compliance and suggested best practices are discussed under the following subheadings in this chapter:

- Airport Compliance with Federal and State Grant Assurances
- Environmental Compliance
- Airport User Compliance
- Other Airport Operational Policies and Procedures

AIRPORT COMPLIANCE WITH GRANT ASSURANCES

As a recipient of federal airport improvement grant funds, the Oregon Department of Aviation is contractually bound to various sponsor obligations referred to as "Grant Assurances" that have been compiled by the FAA. These obligations, presented in detail in federal grants and state statutes and administrative codes, document the commitments made by the Oregon Department of Aviation to fulfill the intent of the grantor (FAA) resulting from acceptance of federal funding for airport improvements. Failure to comply with the grant assurances may result in a finding of noncompliance and/or forfeiture of future funding. Grant assurances and their associated requirements are to protect the significant investment made by the FAA to preserve and maintain the nation's airports as a valuable national transportation asset, as mandated by Congress.

FAA GRANT ASSURANCES

The FAA's Airport Compliance Program defines the interpretation, administration, and oversight of federal sponsor obligations contained in grant assurances. Currently **FAA Order 5190.6B**, Airport Compliance Manual, defines policies and procedures for the Airport Compliance Program. Although it is not regulatory or controlling with regard to airport sponsor conduct, it establishes the policies and procedures for FAA personnel to follow in carrying out the FAA's responsibilities for ensuring compliance by the sponsor.

Order 5190.6B states: the FAA Airport Compliance Program is, "...designed to monitor and enforce obligations agreed to by airport sponsors in exchange for valuable benefits and rights granted by the United States in return for substantial direct grants of funds and for conveyances of federal property for airport purposes. 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. This order addresses the types of commitments, how they apply to airports, and what FAA personnel are required to do to enforce them."

To better understand the intent of the FAA Compliance Program, it is important to understand the FAA's goals for a national airport system. The national airport system is currently known as the National Plan of Integrated Airport Systems (NPIAS), which has historic origins dating back to the 1946 Federal Airports Act. The airport system has evolved through several legislative updates in concert with changes in the organization and scope of the FAA. The NPIAS was adopted as part of the Airport and Airway Development

Act of 1982, replacing the National Airspace System Plan (NASP), created by earlier legislation. There are approximately 2,500 general aviation airports and 800 commercial service airports in the NPIAS.

According to the FAA, cooperation between the FAA, state, and local agencies should result in an airport system with the following attributes:

- Airports should be safe and efficient, located at optimum sites, and be developed and maintained to appropriate standards;
- Airports should be operated efficiently both for aeronautical users and the government, relying primarily on user fees and placing 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 accommodate new aircraft types;
- Airports should be permanent, with assurance that they will remain open for aeronautical use over the long-term;
- Airports should be compatible with surrounding communities, maintaining 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;
- 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 not more than 20 miles of travel to the nearest NPIAS airport; and
- The airport system should help air transportation contribute to a productive national economy and international competitiveness.

FAA Airport Improvement Program (AIP) grant assurances are summarized and categorized by airport function (highlighted in blue) in **Table 10-1**.

TABLE 10-1: SUMMARY OF FAA AIP GRANT ASSURANCES (AIRPORT SPONSOR ASSURANCES 3/2014)

GRANT ASSURANCE NO.	GENERAL AIRPORT	PROJECT PLANNING / DESIGN & CONTRACTING	AIRPORT OPERATIONS AND LAND USE	DAY TO DAY AIRPORT MANAGEMENT	PROJECT CONSTRUCTION	LEASES & FINANCIAL	OTHER
1. General Federal Requirements							
2. Responsibility and Authority of the Sponsor							
3. Sponsor Fund Availability							
4. Good Title							
5. Preserving Rights and Powers							
6. Consistency with Local Plans							
7. Consideration of Local Interest							
8. Consultation with Users							
9. Public Hearings							
10. Metropolitan Planning Organization							
11. Pavement Preventative Maintenance							
12. Terminal Development Prerequisites							
13. Accounting System, Audit, and Record Keeping Requirements							
14. Minimum Wage Rates							

GRANT ASSURANCE NO.	GENERAL AIRPORT	PROJECT PLANNING / DESIGN & CONTRACTING	AIRPORT OPERATIONS AND LAND USE	DAY TO DAY AIRPORT MANAGEMENT	PROJECT CONSTRUCTION	LEASES & FINANCIAL	OTHER
15. Veteran's Preference							
16. Conformity to Plans and Specifications							
17. Construction Inspection and Approval							
18. Planning Projects							
19. Operations and Maintenance							
20. Hazard Removal and Mitigation							
21. Compatible Land Use							
22. Economic Nondiscrimination							
23. Exclusive Rights							
24. Fee and Rental Structure							
25. Airport Revenues							
26. Reports and Inspections							
27. Use by Government Aircraft							
28. Land for Federal Facilities							
29. Airport Layout Plans							
30. Civil Rights							

GRANT ASSURANCE NO.	GENERAL AIRPORT	PROJECT PLANNING / DESIGN & CONTRACTING	AIRPORT OPERATIONS AND LAND USE	DAY TO DAY AIRPORT MANAGEMENT	PROJECT CONSTRUCTION	LEASES & FINANCIAL	OTHER
31. Disposal of Land							
32. Engineering and Design Services							
33. Foreign Market Restrictions							
34. Policies, Standards and Specifications							
35. Relocation and Real Property Acquisition							
36. Access by Intercity Bus							
37. Disadvantaged Business Enterprises							
38. Hangar Construction							
39. Competitive Access							

While sponsors should understand and comply with all grant assurances, there are several assurances that are common and recurring issues for airport sponsors throughout the country. These are summarized in more detail below. A complete description of current AIP grant assurances is provided in **Appendix E**. It is important to note that the assurances (and corresponding numbers) are applied to non-airport sponsors undertaking noise compatibility program projects and planning agency sponsors. These can also be found in the Airport Improvement Program (AIP) under Grant Assurances.

As the airport sponsor, ODA is responsible for the direct control and operation of Bandon State Airport. Familiarity with proper monitoring and implementation of sponsor obligations and FAA grant assurances, in particular, are keys to maintaining compliance. FAA Order 5190.6B and ongoing communication with the [FAA Northwest Mountain Region Compliance Office](#) are both excellent resources when addressing policy and compliance.

DURATION

The terms, conditions, and assurance of a grant agreement with the FAA remain in effect for the useful life of a development project, which is typically 20 years from the receipt of the last grant. However, terms, conditions, and assurances associated with land purchased with federal funds do not expire.

The airport sponsor should have a clear understanding of and comply with all assurances. The following sections described were excerpted (without revision) from published FAA guidance for more detail.

Project Planning, Design and Contracting

Sponsor Fund Availability (Assurance #3)

Once a grant is given to an airport sponsor, the receiving sponsor commits to providing the funding to cover their portion of the total project cost. Currently this amount is ten percent of the total eligible project cost, although it may be higher depending on the particular project components or makeup. Once the project has been completed, the receiving airport also commits to having adequate funds to maintain and operate the airport in the appropriate manner to protect the investment in accordance with the terms of the assurances attached to and made a part of the grant agreement.

Consistency with Local Plans (Assurance #6)

All projects must be consistent with city and county comprehensive plans, transportation plans, zoning ordinances, development codes, and hazard mitigation plans. The airport sponsor and planners should familiarize themselves with local planning documents before a project is considered to ensure that all projects follow local plans and ordinances.

In addition to understanding local plans, airport sponsors should be proactive in order to prevent noncompliance with this assurance. The airport sponsor should assist in the development of local plans that incorporate the airport and consider its unique aviation related needs. Sponsor efforts should include the development of goals, policies, and implementation strategies to protect the airport as part of local plans and ordinances.

Accounting System Audit and Record Keeping (Assurance #13)

All project accounts and records must be made available at any time. Records should include documentation of cost, how monies were actually spent, funds paid by other sources, and any other financial records associated with the project at hand. Any books, records, documents, or papers that pertain to the project should be available at all times for an audit or examination.

General Airport

Good title (Assurance #4)

The airport owner must have a Good Title to affected property when considering projects associated with land, buildings, or equipment. Good Title means the sponsor can show complete ownership of the property without any legal questions, or show it will soon be acquired.

Preserving Rights and Powers (Assurance #5)

No actions are allowed, which might take away any rights or powers from the sponsor, which are necessary for the sponsor to perform or fulfill any conditions set forth by the assurance included as part of the grant agreement. If there is an action taken or activity permitted that might hinder any of those rights or powers it should be discontinued. An example of an action that can adversely affect the rights and powers, of the airport is a Through-the-Fence (TTF) activity. TTF activities allow access to airport facilities from off-airport users. In many instances, the airport sponsor cannot control the activities of those operating off the airport resulting in less sponsor control. This loss of control can potentially have an adverse impact to airport users. For example, TTF activities often do not pay the same rates and charges as on-airport users, resulting in an unfair competitive advantage for businesses and users located off-airport.

Airport Layout Plan (ALP) (Assurance #29)

The airport should at all times keep an up-to-date ALP, which should include current and future boundaries, facilities/structures, locations of non-aviation areas, and existing improvements. No changes should be made at the airport to hinder the safety of operations; also no changes should be made to the airport that are not in conformity with the ALP. Any changes of this nature could adversely affect the safety, utility, or efficiency of the airport. If any changes are made to the airport without authorization the alteration must be changed back to their original condition or the airport will have to bear all costs associated with moving or changing the alteration to an acceptable design or location. Additionally no federal participation will occur for improvement projects not shown on an approved ALP.

Disposal of Land (Assurance #31)

Land purchased with the financial participation of an FAA Grant cannot be sold or disposed of by the airport sponsor at their sole discretion. Disposal of such lands are subject to FAA approval and a definitive process established by the FAA. If airport land is no longer considered necessary for airport purposes, and the sale is authorized by the FAA, the land must be sold at fair market value. Proceeds from the sale of the land must either be repaid to the FAA, reinvested into another eligible airport improvement, or noise compatibility project. Land disposal requirements typically arise when a community is building a new

airport and the land on which the airport was located is sold with the proceeds used to offset costs of the new airport. In general, land purchased with FAA funds is rarely sold by a sponsor.

Airport Operations and Land Use

Pavement Preventative Maintenance (Assurance #11)

Since January 1995, the FAA has mandated that it will only give a grant for airport pavement replacement or reconstruction projects if an effective airport pavement maintenance-management program is in place. The program should identify the maintenance of all pavements funded with federal financial assistance. The report provides a pavement condition index (PCI) rating (0 to 100) for various sections of aprons, runways, and taxiways; including, a score for overall airport pavements.

Operations and Maintenance (Assurance #19)

All federally funded airport facilities must operate at all times in a safe and serviceable manner. The airport sponsor should not allow for any activities which inhibit or prevent this. The airport sponsor must always promptly mark and light any hazards on the airport, and promptly issue Notices to Airmen (NOTAMs) to advise of any conditions which could affect safe aeronautical use. Exceptions to this assurance include when temporary weather conditions make it unreasonable to maintain the airport. Further, this assurance does not require the airport sponsor to repair conditions which have happened because of a situation beyond the control of the sponsor.

Compatible Land Use (Assurance #21)

Land uses around an airport should be planned and implemented in a manner which ensures surrounding development and activities are compatible with the airport. To ensure compatibility, the sponsor is expected to take appropriate action, to the extent reasonable, including the adoption of zoning laws to guide land use in the vicinity of airports under their jurisdiction. Incompatible land use around airports represents one of the greatest threats to the future viability of airports.

Day to Day Airport Management

Economic Non-Discrimination (Assurance #22)

Any reasonable aeronautical activity offering service to the public should be permitted to operate at the airport as long as the activity complies with airport established standards for that activity. Any contractor agreement made with the airport will have provisions making certain the person, firm, or corporation will not be discriminatory when it comes to services rendered as well as rates or prices charged to customers. Provisions include:

- All FBOs on the airport should be subject to the same rate fees, rentals, and other charges.
- All persons, firms, or corporations operating aircraft can work on their own aircraft with their own employees.
- If the airport sponsor at any time exercises the rights and privileges of this assurance, they will be under all of the same conditions as any other airport user would be.
- The sponsor can establish fair conditions, which need to be met by all airport users to make the airport safer and more efficient.

The sponsor can prohibit any type, kind, or class of aeronautical activity if it is for the safety of the airport. An example of an activity which may be considered for prohibition is sky diving. It is important to point out that the FAA will review such prohibitions and will make the final determination as to whether or not a particular activity type is deemed unsafe at the airport based on current operational dynamics.

Exclusive Rights (Assurance #23)

Exclusive rights at an airport are often a complicated subject usually specific to individual airport situations. The assurance states the sponsor “will permit no exclusive right for the use of the airport by any person providing, or intending to provide, aeronautical services to the public...” However, there are exceptions to this rule. If the airport sponsor can prove that permitting a similar business would be unreasonably costly, impractical, or result in a safety concern, the sponsor may consider granting an exclusive right. To deny a business opportunity because of safety, the sponsor must demonstrate how that particular business will compromise safety at the airport. Exclusive rights are very often found in airport relationships with fixed base operators (FBO), but exclusive rights can also be established with any other business at the airport that could assist in the operation of an aircraft at the airport. If an unapproved exclusive rights agreement exists, it must be dissolved before a future federal grant can be awarded to the airport.

If a sponsor is contemplating denial of a business use at the airport, it is strongly encouraged that they contact their FAA Airports District Office (ADO) in order to ensure that they have all necessary information and that denial of access is not going to be seen as unjust discrimination. For more in depth information on exclusive rights reference **Advisory Circular 150/5190-6**, "[Exclusive Rights at Federally Obligated Airports](#).”

Leases and Finances

Fee and Rental Structure (Assurance #24)

Simply put, the fee and rental structure at the airport must be implemented with the goal of generating enough revenue from airport related fees and rents to become self-sufficient in funding day to day operational needs. The airport sponsor should routinely monitor its fee and rental structure to ensure reasonable fees are being charged to meet this goal. Common fees charged by airports include fuel flowage, tie-down, landing fees, and hangar rent.

Airport Revenue (Assurance #25)

All airport revenue and local taxes on aviation fuel should be used toward the operating costs of the airport, the local airport system, or other local facilities that are owned by the same owner of the airport, which will directly affect air transportation passengers or property, or for noise mitigation on or off airport property. In other words, revenue generated by airport activities must be used to support the continued operation and maintenance of the airport. Use of airport revenue to support or subsidize other non-aviation activities or functions of the sponsor is not allowed and is considered revenue diversion. Revenue diversion is a significant compliance issue subject to cause scrutiny by the FAA.

Other FAA Compliance Requirements

OTHER FEDERAL CONTRACTING AND PROCUREMENT DOCUMENTS

When an airport sponsor accepts an FAA Airport Improvement Program (AIP) grant, they agree to adhere to all applicable federal contracting and procurement requirements. Advisory circulars are required for use in AIP funded projects. Included in each grant request is a federal funding checklist that identifies the requirements an airport should consider before accepting the grant. The following items are noted in the checklist:

- ALPs should be up to date
- Exhibit A Property Map may need to be updated if acquiring additional property
- Land Inventory may need to be updated if you have recently acquired land with federal assistance
- Airports must hold good title to the airport landing area
- Appropriate signage and markings must be in place
- Runway Protection Zone and approach surface deficiencies must be identified and steps to address deficiencies must be noted
- Runway Safety Areas must meet FAA standards if planning a runway project
- Disadvantaged Business Enterprise program goals must be met on projects of more than \$250,000

- Procedures should be in place to handle bid protests
- Open AIP grant projects need to be identified
- Project closeout forms must be submitted within 90 days of work completion
- A “Certification of Economic Justification” must be included for routine pavement maintenance projects
- A “Revenue Generating Facility Eligibility Evaluation” must be completed for hangar construction or fueling facilities
- A “Reimbursable Agreement” and “Non-Fed Coordination” must be completed for navigational aid projects
- A “Relocation Plan” must be completed if a project requires residences or businesses to be relocated

SPECIAL CONDITIONS

In addition to the standard grant assurances discussed above, the state or the FAA may require “Special Conditions” to individual grants which supplement or expand the standard grant assurances. Special Conditions are unique to an individual airport and can be project or administrative in nature. Airport sponsors need to be aware of such conditions that may be applied to their airport.

MULTIJURISDICTIONAL CHALLENGES

In some instances, airports are jointly owned and operated by more than one airport sponsor. In other instances, airports may be located within multiple jurisdictions. While the official airport sponsor is ultimately responsible for adherence with the grant assurance, the actions, or inactions, of surrounding jurisdictions can and do affect the airport sponsor’s ability in meeting its obligations. This is particularly true with land use compatibility issues around airports. As a result, it is important in either circumstance that all jurisdictions affected by the airport understand the operational needs and complexities of having an airport within its jurisdiction. Mutual agreements addressing airport operational or land use protection needs, or other cooperative measures, are recommended by all jurisdictions to both protect the functionality of the airport as well as the safety and well-being of airport users and neighbors.

FAA THROUGH-THE-FENCE (TTF)

Bandon State Airport has one active Through-the-Fence user (Bandon Aero Club, Inc.) with an existing Ingress/Egress agreement. A copy of this agreement is provided in **Appendix F**. The TTF activity is located on the west side of the airport with an access point connecting to the main apron. The off-airport aviation facilities include five conventional hangars (aircraft storage, FBO, and maintenance hangar), one double-sided T-hangar, one multi-unit hangar, and one pilot lounge building.

Through-the-Fence access is discouraged by the FAA due to concerns over land use compatibility, security, safety, and economic inequity (economic discrimination) between on- and off-airport users. Economic

discrimination is “an unjust economic advantage or disadvantage for one airport user versus another by charging one more or less than another, and therefore creating an advantage or disadvantage.” However, when Through-the-Fence use exists or is proposed, the FAA requires airport sponsors to develop access plans and establish agreements consistent with FAA grant assurances. To maintain economic parity within the agreements, Through-the-Fence users are typically required to compensate the airport owner for the access in a way that is comparable to an equivalent on-airport user.

FAA Through-the-Fence Policies

“On March 14, 2011, the FAA amended Grant Assurance 5, Preserving Rights and Powers, to prohibit new residential through-the-fence access arrangements and published an interim policy to address existing residential through-the-fence access. The interim policy required all AIP grant-eligible airport sponsors to certify their status. Those sponsors with existing access agreements were directed to depict their residential through-the-fence access points on their airport layout plan (ALP) and develop access plans to address¹:

- General Authority for Control of Airport Land and Access;
- Safety of Airport Operations;
- Recovery of Costs of Operating the Airport;
- Protection of Airport Airspace; and
- Compatible Land Uses Around the Airport.”

“On February 14, 2012, the FAA Modernization and Reform Act of 2012 was signed into law (P.L. 112-95), Section 136 of this law states:

...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 provisions 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 person
- (B) Aircraft authorized by the person

In addition, this law outlines specific conditions and limitations that must be in the access agreement. Beginning on October 1, 2014, an airport sponsor with an existing residential through-the-fence access agreement will be required to demonstrate evidence of compliance with this law. Specifically, these airport sponsors are required to update their airport layout plans to depict points of residential through-the-fence

¹ FAA Compliance Guidance Letter 2013-01-FAA Review of Existing and Proposed Residential Through-the-Fence Access Agreements (July 16, 2013)

access and provide a copy or copies of their access agreements to demonstrate the sponsor’s compliance with the law.”

Solid Waste and Recycling Plan

INTRODUCTION

This section of the chapter discusses the solid waste generation at the Airport and what recycling options are utilized. The layout of this section is outlined below:

Waste Audit

- 10.2.2 Recycling Feasibility
- 10.2.3 Plan to Minimize Solid Waste Generation
- 10.2.4 Operational and Maintenance Requirements
- 10.2.5 Waste Management Contracts
- 10.2.6 Potential for Cost Savings or Revenue Generation
- 10.2.7 Future Development and Recommendations

Waste Audit

Due to the size of the Bandon State Airport minimal waste is generated on site. Specific sources of waste on site include private hangars, Bandon Aviation FBO, and Kehl Fire Station. The tenants are individually responsible for waste generated by their operations. Les County Sanitary Service currently provides trash and recycling hauling service for the Bandon Aero Club. Aero Club trash is picked up every other Thursday in a 2-yard frontload container and hauled to the Beaver Hill disposal site. Comingled recycling generated by the Aero Club is provided except for glass, and also serviced every other Thursday in a 2-yard container.

WASTE DISPOSAL

Each individual tenant is also responsible for disposal and recycling of their own waste as stipulated in their leases with the Oregon Department of Aviation (ODA). Les County Sanitary Service services the Airport area and would be the contractor each tenant will contract with for waste and recycling hauling to the Beaver Hill transfer station located about 20 miles NE of the airport. No State or Federal requirements apply to the waste generated. Les County Sanitary Service provides comingled recycling including aluminum, tin cans, plastic containers, paper, and cardboard. They do not provide service for glass, or other non-standard recyclables. These items would need to be transported by individual tenants to the Beaver Hill disposal site, which accepts glass as well as non-standard recyclables such as flower pots, oil, antifreeze, batteries, phones electronic waste, and paint. The only items not accepted at the Beaver Hill disposal site are household hazardous wastes.

CONSTRUCTION WASTE

Construction waste is the responsibility of the Contractor for each specific project. Projects identified on the 5-year CIP are listed in Table 10-2 below.

2016

Waste resulting from projects in 2016 would be debris generated by the tree removal and asphalt pavement waste generated by the reconstruction of the apron and taxiway and any clearing/grubbing associated with that project. The waste produced would have to be removed at the Contractor's expense.

2017

No demolition or construction waste is anticipated in 2017 because these projects would be new construction.

2018

Waste resulting from projects in 2018 would be generated by the construction of the gravel road and vehicle parking area and any clearing and grubbing associated with those projects. The waste produced would have to be removed at the Contractor's expense.

2019

No demolition or construction waste is anticipated in 2019 because these projects would be new construction.

2020

Demolition and construction waste would result from removed asphalt pavement and any clearing and grubbing associated with the taxiway extension. The waste produced would have to be removed at the Contractor's expense.

TABLE 10-2: SUMMARY OF FUTURE PROJECTS

SHORT-TERM	PROJECT
2016	Tree Clearing - RWY 16 RPZ (Avigation Easement)
	Runway - Sealcoat/Repaint Markings
	Parallel Taxiway and Mid-Field Exit Taxiway - Sealcoat/Repaint Markings
	Main Apron, South Entrance Taxiway, North Taxilane-Sealcoat/Repaint Markings
	Apron and Taxilane Reconstruction (off-airport)
2017	Install Automated Weather Observation System (AWOS)
	Install Vehicle Automated Gate and Fencing (Airport Entrance from Kehl Rd)
2018	Phase 1 Landside Improvements (Hangar Area) - Gravel Road and Vehicle Parking
	Phase 1 Landside Improvements (Hangar Area) - Extend Electrical Service (underground)
2019	Relocate Segmented Circle and Install New Windcone
	Parallel Taxiway Edge Reflectors (Replacement)
2020	Phase 2 Landside Improvements - Taxiway Extension and Taxiway Removal

RECYCLING FEASIBILITY

Recycling services currently available at the Airport are: aluminum, tin cans, plastic containers, paper, and cardboard. The Beaver Hill transfer station, however, can facilitate items beyond those provided at the Airport, and the Coos County website provides a list of local contacts for other recyclable items. The list below outlines material and recycle locations for Coos County.

TABLE 10-3: RECYCLABLE OPTIONS

MATERIAL	RECYCLE LOCATION
Aluminum	Airport & Beaver Hill
Glass Bottles	Beaver Hill
Plastic Containers	Airport, Beaver Hill
Paper	Airport, Beaver Hill
Tin Cans	Airport, Beaver Hill
Vehicle Batteries	Beaver Hill, Public Disposal, Battery X-Change
Cell Phone, Rechargeable Batteries, and Chargers	Beaver Hill, Wal-Mart, Teletron, Farr’s True Value
Electronic Waste	Beaver Hill, Goodwill, Public Disposal

CURRENT PRACTICES

According to OAR 340-090-0040, cities with a population greater than 4,000 residents must maintain some sort of recycling option. The population of Bandon was estimated to be 3,100 by Portland State University, as referenced on the City of Bandon’s website. The U.S. Census Bureau lists the official 2010 population of Bandon as 3,066. With a population below the 4,000 resident threshold, the City is not required to provide receptacles, weekly collection service, or an education and promotion program to its residents. It is the responsibility of individual residents to dispose of recyclable waste.

Airport hangar tenants (as stipulated in their ODA leases) are individually responsible for waste disposal and recycling for their hangars and have the opportunity to take advantage of commingled recycling services offered by Les County Sanitary Service. Disposal of glass or any non-standard recyclables (glass bottles, vehicle batteries, cell phones, rechargeable batteries, chargers, and other electronic waste) is the responsibility of the individual tenants. These non-standard recyclables can be delivered to the appropriate locations listed in Table 10-3 above.

Plan to Minimize Solid Waste Generation

Coos County can implement programs to reduce solid waste generation and earn “credits” toward recovery rates mandated by the state of Oregon. In 1997, House Bill 3456 created three programs that a wasteshed—in this case, Coos County can choose to implement:

- Waste Prevention Program
- Reuse Program
- Residential Composting Program

A two percent “credit” can be obtained for each program by creating an education or promotional campaign and adhering to at least two components listed by the Oregon Department of Environmental Quality (ODEQ). Credits of up to six percent can be deducted from the County’s state mandated material recovery and waste generation rate if the County participates in all three programs – resulting in a two percent credit for each program implemented. Coos County has not implemented any of these programs as yet. The County is required to maintain a 30 percent recovery rate as set forth in Oregon Chapter 459A – Reuse and Recycling, 2013 Edition. During the most recent year for which DEQ has compiled wasteshed recovery rates - 2013, Coos County achieved a calculated 40.3% waste recovery rate (2013 Oregon Material Recovery and Waste Generation Rates Report).

METHODS TO REDUCE SOLID WASTE

There are very limited opportunities to reduce solid waste generation because little waste is produced at the Bandon State Airport. However, the Airport should still establish a goal to reduce the amount of solid waste generated. While the Airport is not responsible for waste generated by hangar tenants, informational brochures on recycling opportunities developed by Coos County could be distributed to all the hangar tenants to encourage them to recycle their waste. To track the amount of waste generated after implementing new policies, the FBO manager could make a note of the amount of waste generated each time waste is removed from the pilot's lounge (bi-weekly).

PHYSICAL CONSTRAINTS

Coos County has a relatively rural population and the current practice of contracting with Les County Sanitary Service is the most effective option. There have not been any efforts by any cities or the County to encourage and promote recycling (SWMP 2005).

Operational and Maintenance Requirements

Operational and maintenance requirements at the Airport are minimal. The Oregon Department of Aviation is responsible for costs associated with mowing the grass. The infield lawn is not watered and the grass is typically only mowed twice per year. When the grass is mowed, the clippings are left in place. Grass clippings typically return to the lawn approximately 25% of the total lawn's fertilizer needs and create a healthy turf environment (Starbuck 1999). The Coos County Solid Waste Management Plan recommends promotion of programs that encourage "leaving grass clippings generated by lawn mowing on-site rather than bagging the clippings for disposal or composting." The current practice is consistent with this recommendation.

Waste Management Contracts

Janitorial and hangar leases provided by ODA are shown in **Appendix G** and were reviewed for information regarding waste and recycling. No hauling or landfill contracts are available.

The hangar lease dictates that tenants "shall maintain the grounds and premises in and around the rental area in a reasonably neat, clean, and orderly condition." Although tenants are responsible for their own waste from the hangar, no mention for the opportunity for recycling is included in the lease. Proceeds from rent are used for general airport maintenance and cleaning services. The janitorial services contract dictates that a contractor will perform cleaning and maintenance services at the Airport once a week. The janitorial services contract does not include any stipulation for recycling.

To promote additional recycling opportunities, language could be added to the hangar lease that encourages the tenant to utilize the south-transfer recycling center less than a half-mile from the Airport and to be conscientious of any waste generated in the hangar.

Potential for Cost Savings or Revenue Generation

The potential for cost savings is limited since individual tenants are responsible for costs associated with solid waste disposal and recycling.

Revenue generation is also limited due to the small amount of waste generated. Any potential for additional revenue would accrue to the individual tenants since they contract with the waste disposal and recycling provider.

Future Development and Recommendations

FUTURE DEVELOPMENT

Future development projects at the Airport include tenant improvements, landside and airside facility development, and rehabilitation projects. The demolition and waste associated with each of these projects would be the responsibility of the Contractor performing the work. It is assumed that the demolition waste would be taken to the Beaver Hill Transfer Station.

A periodic review of the Airport's solid waste plan needs to be implemented to allow for any unforeseen future development. For example, if glass recycling would become available and feasible for the Airport, then the Airport would need to reevaluate that option based on current practices.

RECOMMENDATIONS

Immediate

An immediate recommendation would be to continue with the existing practice of leaving lawn clippings, which saves money on disposal fees at the transfer station while preserving the aesthetics of the infield area.

Short-Term

A short-term recommendation would be to add a statement into hangar leases advising tenants of the recycling options available at the Beaver Hill transfer station and to encourage tenants to recycle and minimize waste. Additionally, informational brochures on recycling opportunities developed by the County could be distributed to all of the hangar tenants to encourage them to recycle their waste.

Ongoing

An ongoing recommendation would be to reevaluate the Airport's solid waste plan, especially after development has occurred. Any increase in hangars, while not currently foreseen may increase the amount of waste generated.

Modifications to Specifications

Language in construction contract documents could be added that encourages Contractors to recycle waste at the Beaver Hill disposal site and to minimize waste caused by construction activities as much as practical.

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Coos County and Curry County, Oregon - Final Household Hazardous Waste Management Plan
March 28, 2008 Website: http://www.co.coos.or.us/Portals/0/SolidWaste/Coos-Curry_HHW_FinalPlan_3-28-08.pdf

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RECYCLING OPTIONS

http://www.co.coos.or.us/Portals/0/Waste%20Management/recyclable_items_accepted_bh.pdf

http://www.co.coos.or.us/Portals/0/Solid%20Waste/recycling_drop_off_locations_misc.pdf

HOUSEHOLD HAZARDOUS WASTE MANAGEMENT PLAN

http://www.co.coos.or.us/Portals/0/Solid%20Waste/Coos-Curry_HHW_FinalPlan_3-28-08.pdf

POPULATION

<http://www.cityofbandon.org/general/page/about-bandon>

RECYCLING ALTERNATIVES PLAN BEAVER HILL

<http://www.co.coos.or.us/Portals/0/Coos%20County%20SW%20Disposal%20Alternatives%20Final%20Report.pdf>

WASTE REDUCTION AND REUSE

<http://www.co.coos.or.us/Portals/0/Waste%20Management/wastereduction.pdf>

Appendix A



memorandum

date March 10, 2015
to W. Matt Rogers, P.E.
from Susan Cunningham
subject **Bandon State Airport**

The Bandon State Airport is located within the Urban Growth Boundary of the City of Bandon, but outside of the City Limits. The Airport is located in Township 29 South, Range 14 West, Section 6, Willamette Meridian (43 degrees 05' 14" N, 124 degrees -24' 34" W). The Airport mainly serves general aviation. Surrounding land use is mainly industrial and open space, with a limited amount of rural residential and aquiculture.

The Airport consists of a north-south runway with parallel taxiway and apron on the southwest end. The Oregon Department of Aviation is currently in the process of updating the Airport Master Plan. The Master Plan is considering both airside (taxiway and runway extension) and landside (apron redevelopment) improvements. The airside improvements would include a 300 foot extension of the taxiway and runway. Landside improvements would include redevelopment of the apron area to accommodate additional hangers and industrial uses. Re-aligning the public access road is also being considered.

This technical memorandum documents wetlands and other water bodies, and the fish, wildlife, plant and wetland resources that could occur in the study area for the project. Species evaluated in this memorandum are those listed as endangered or threatened, proposed for listing, or candidate for listing under the Endangered Species Act (16 US 1531, et seq.), as amended, that could occur in the project vicinity in Coos County. Additionally, Oregon state listed plant species were included.

The study area for this project is defined as the area on the airport that would be directly affected by the proposed project. The study area is not limited to the actual work site of the project area. The terrestrial study area is generally considered to extend approximately one-half mile from the area of potential impacts. This distance represents the most commonly recognized limit of concern for disturbance to terrestrial species for typical construction activities.

Wetlands, Water Resources, and Floodplains

Wetlands are under the jurisdiction of both Oregon Department of State Lands (DSL) and the US Army Corps of Engineers (Corps). Both agencies use the Corps of Engineers Wetland Delineation Manual (Experimental Laboratory 1987) and the Arid West Wetland Delineation Supplement Manual (Corps of Engineers 2008) for determining what a wetland is and the extent of a wetland. An area is determined to be a wetland if it has a dominance of hydrophytic vegetation (plants that grow in wet conditions), hydric soils, and positive wetland hydrology.

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The National Wetland Inventory shows Johnson Creek on the north and east side of the Airport, a series of agricultural areas off the southeast corner of the property, and an un-named tributary of Johnson Creek on the east side of the property. A Local Wetlands Inventory was conducted by Pacific Habitat Services and adopted and approved by DSL in 2005. Both the mainstem of Johnson Creek (denoted as JOH 3-E) and the un-named tributary of Johnson Creek (denoted as JOH-17) were determined to be jurisdictional wetlands that could occur in the project. A portion of Johnson Creek has been previously delineated (WD 93-0205). Wetland delineations are valid for a period of 5 years. Since the delineation is over 5 years old, the wetland boundaries would need to be verified if any development were to occur in the vicinity of the wetland. The area where the runway extension is proposed should be delineated for wetlands since it comes within close proximity to Johnson Creek.

Additionally, the mainstem of Johnson Creek (JOH 3-E) was determined to be a Locally Significant Wetland. Chapter 17.102 of the Bandon Zoning Code provides protection for identified significant wetlands within the City of Bandon as designated under Statewide Planning Goal 5. This chapter also (1) ensures reasonable economic use of property while protecting valuable natural resources within the City of Bandon; and (2) establishes clear and objective standards to protect these resources. A request to deviate the requirements of this chapter may be submitted for consideration by the Planning Commission. A variance request may be approved as long as equal or better protection of the wetland will be ensured through a plan for restoration, enhancement, or similar means, and if applicable permits from DSL and the Corps are obtained. In no case shall activities prohibited in Section 17.102.020(E) occupy more than 25% of the wetland. Granting of a variance requires that the property owner submit findings that:

1. the proposed development requires deviation from the wetland standards; and
2. strict adherence to the wetland standards would effectively preclude a use of the parcel that could be reasonably expected to occur in the zone, and
3. that the property owner would be precluded a substantial property right enjoyed by the majority of the property owners in the vicinity.

In all cases, the Planning Commission shall determine whether the proposal is seeking the minimum intrusion into the wetland necessary for the proposal.

State and Federal Sensitive, Threatened and Endangered Species

Species lists were obtained from the U.S. Fish and Wildlife Service (USFWS) website (February 24, 2015). Species listed under ESA addressed in this Memorandum are displayed in **Table 1**. There is no designated Critical Habitat for any species within the study area.

The Oregon Biodiversity Information Center (ORBIC) database was also queried to obtain records of known sensitive, threatened and endangered plant and animal species within a 2 mile radius of the Airport (ORBIC 2015). There are no records of any listed species occurring on Airport property.

The Airport is within the Johnson Creek watershed. Fish species known to occur in Johnson Creek are cutthroat trout, Pacific Lamprey, and sculpin. None of these species are currently listed.

Table 1. ESA Species Listed by the USFWS Lists That Could Potential Occur in the Project Area

Species Common Name (Scientific Name)	Federal Endangered Species Act Status	Actual Occurrence in Action Area
Marbled murrelet (<i>Brachyramphus marmoratus</i>) Population: CA, OR, WA	Threatened	There are documented occurrences of marbles murrelets within a 2 mile radius of the airport (ORBIC 2015). There is no suitable habitat within the project area.
Northern spotted owl (<i>Strix occidentalis caurina</i>) Population: Entire	Threatened	There are documented occurrences of northern spotted owls within a 2 mile radius of the airport (ORBIC 2015). There is no suitable habitat within the project area.
Western snowy plover (<i>Charadrius nivosus ssp. nivosus</i>) Population: Pacific coastal population	Threatened	No documented occurrences and no suitable habitat within the project area (ORBIC 2015).
Western lily (<i>Lilium occidentale</i>)	Endangered	No documented occurrence (ORBIC 2015) but potential suitable habitat within the project area.
Silvery phacelia (<i>Phacelia argentea</i>)	Species of Concern State Threatened	No documented occurrences and no suitable habitat within the project area (ORBIC 2015).
Pink sandverbena (<i>Abronia umbellata ssp. breviflora</i>)	Species of Concern State Endangered	No documented occurrences and no suitable habitat within the project area (ORBIC 2015).
Fisher (<i>Martes pennanti</i>) Population: West coast DPS	Proposed Threatened	There are documented occurrences of northern spotted owls within a 2 mile radius of the airport (ORBIC 2015). There is no suitable habitat within the project area.

The **marbled murrelet** is a small, chubby seabird that has a very short neck. They spend the majority of their lives on the ocean, but come inland to nest. They generally nest in old-growth forests, characterized by large trees, multiple canopy layers, and moderate to high canopy closure. These forests are generally located close enough to the marine environment for the birds to fly to and from nest sites. Threats include loss of habitat, predation, gill-net fishing operations, oil spills, marine pollution, and disease (USFWS website accessed March 6, 2015). The airport does not contain any areas of old growth forest that would be suitable for the marbled murrelet and there are no documented occurrences of marbled murrelets within the project area (ORBIC 2015). The project area is outside designated critical habitat for the marbled murrelet (USFWS, website accessed March 6, 2015). The project would have no effect on this species.

Northern spotted owl live in forests characterized by dense canopy closure of mature and old-growth trees, abundant logs, standing snags, and live trees with broken tops. Although they are known to nest, roost, and feed in a wide variety of habitat types, spotted owls prefer older forest stands with variety multi-layered canopies of several tree species of varying size and age, both standing and fallen dead trees, and open space among the lower branches to allow flight under the canopy (USFWS website accessed March 6, 2015). Critical habitat was first designation came in 1992 and was revised in 2008. A new final rule designating critical habitat was published in

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December 2012. The USFWS issued a recovery plan for the spotted owl in 2008 and revised it in 2011. The airport does not contain any areas of old growth forest that would be suitable for the spotted owl and there are no documented occurrences of spotted owls within the project area (ORBIC 2015). The project area is outside designated critical habitat for the spotted owl (USFWS, website access March 6, 2015). The project would have no effect on this species.

The Pacific coast population of the **western snowy plover** breeds primarily on coastal beaches from southern Washington to southern Baja California, Mexico. The population breeds above the high tide line on coastal beaches, sand spits, dune-backed beaches, sparsely-vegetated dunes, beaches at creek and river mouths, and salt pans at lagoons and estuaries (U.S. Fish and Wildlife Service 2001). In Oregon, snowy plovers historically nested at 29 locations on the coast (USDI Fish and Wildlife Service 2006). Currently, there are only 10 nesting locations, one of which is the Bandon State Natural Area which is designated as critical habitat. The airport does not contain habitat that would be suitable for the snowy plover and there are no documented occurrences of snowy plovers within the project area (ORBIC 2015). The project area is outside designated critical habitat for the snowy plover (USFWS, website access March 6, 2015). The project would have no effect on this species.

The **western lily** grows at the edges of sphagnum bogs and in forest or thicket openings along the margins of ephemeral ponds and small channels. It also grows in coastal prairie and scrub near the ocean where fog is common. Associated species often include: Sitka spruce, beach pine, Port Orford-cedar, crabapple, willow, wax myrtle, western rhododendron, evergreen huckleberry, salal, Labrador tea, Douglas' spiraea, blackberry, Pacific reedgrass, blackberry, sedge, gentian, sphagnum moss, and in some cases, the *Darlingtonia* pitcher-plant. The primary long-term natural threat to western lily is competitive exclusion by shrubs and trees as a result of succession in bogs and coastal prairie/scrub. Human activities such as clearing and draining of wetlands, development of cranberry agriculture, urban development pressure, and alteration of natural hydrological processes are also major factors. A large population was recently eliminated near Bandon by unauthorized cranberry development (USFWS 2015). There are five known locations of western lily within a 2-mile radius of the Airport all on private property. Two of these populations were reported as extirpated by the USFWS in 2009 (ORBIC 2015). Although there are no documented occurrences of western lily in the project area (ORBIC 2015), there may be suitable habitat along the wetland fringe of Johnson Creek.

Silvery phacelia occurs along the coast, occupying open sand above the high tide line, open and partly stabilized sand dunes further inland, and coastal bluffs. Silvery phacelia occurs near the coast in Coos and Curry counties, Oregon, and neighboring Del Norte County, California, from the vicinity of Bandon, Oregon, south to the vicinity of Crescent City, California (Oregon Department of Agriculture). There is one historic collection of the species from Clatsop County, Oregon in 1933, but there have been no reports of silvery phacelia from that area since then. The majority of occurrences are in Oregon. The primary threat to silvery phacelia is invasion by non-native plant species, particularly European beachgrass (*Ammophila arenaria*) and gorse (*Ulex europaea*). Residential and recreational coastal development is another serious threat, which can cause habitat fragmentation or extirpation of silvery phacelia populations. Off-road vehicle use, equestrian and pedestrian use, grazing and trampling by livestock, collection of the species for horticultural purposes, and loss of pollinators are other factors that may negatively impact this species (USFWS 2015). There are three known locations of silvery phacelia within a 2-mile radius of the Airport (ORBIC 2015). These plants are along the partially stabilized part of the dune. The closest population is in the Bandon State Natural Area (ORBIC 2015).

The airport does not contain habitat that would be suitable for the slivery phacelia. The project would have no effect on this species.

Pink sandverbena is limited to a few populations in northern California and Oregon. Habitat destruction caused by human activity and exotic plant invasion are the main causes for population decline (Center for Plant Conservation 2015). The endangered western snowy plover appears correlated with the state of pink sandverbena. Both of these species require open sandy beaches, and evidence suggests that the snowy plover uses this sandverbena for forage and cover. Pink sandverbena inhabits open sandy beaches, typically at or below the zone of driftwood accumulation and away from sand dominated by introduced European beachgrass (*Ammophila arenaria*) (Kaye 1997). Approximately six populations have been observed in Oregon since the mid-1980s (Center for Plant Conservation, 2015). There are two known locations of pink sandverbena within a 2-mile radius of the Airport. These plants are along the partially stabilized part of the dune. The closest population is in the Bandon State Natural Area. The airport does not contain habitat that would be suitable for the pink sandverbena. The project would have no effect on this species.

Fishers once occurred throughout much of Canada, the northern United States, and the western United States. Fisher populations declined historically primarily due to loss of habitat from timber harvesting and trapping. The West Coast Distinct Population Segment includes the states of Washington, Oregon, and California. Fishers are known to occur in Oregon and California and were re-introduced into the Olympic Peninsula of Washington in January and March of 2008 (USFWS 2015). Fishers use forest habitats with dense canopy closure, large diameter live trees (conifers and hardwoods) and snags with cavities and other deformities, large diameter down wood, multiple canopy layers. Mature and late-successional coniferous or mixed forests that contain key habitat and structural components provide the most suitable fisher habitat because they provide abundant potential den sites and preferred prey species. The physical structure of the forest (abundant structures for den and rest sites, complexity and diversity of trees and shrubs) and prey associated with these forest conditions are thought to be the critical features that explain fisher habitat use, rather than specific forest types. The West Coast native population of fishers currently inhabits forested areas from sea level along the California/Oregon Coast to approximately 1,970 to 8,530 ft in the Trinity and Klamath/Siskiyou Mountains in northern California and southern Oregon, and Sierra Nevada in California. The airport does not contain any areas of mature or old growth forest that would be suitable for the fisher and there are no documented occurrences of fishers within the project area (ORBIC 2015). The project would have no effect on this species.

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Appendix B



CHAPTER IV

ZONING

CHAPTER IV - ZONING

ARTICLE 4.1. ZONING-GENERAL

SECTION 4.1.100. Establishment of Zoning Districts.

This Ordinance shall divide the lands within the County into the following zoning districts for the following intended purposes:

A. PRIMARY DISTRICTS

1. **Exclusive Agriculture (EFU)**

The purpose of the "EFU" district is to preserve the integrity and encourage the conservation of agricultural lands within Coos County and thereby comply with the provisions of ORS 215; to minimize conflicts between agricultural practices and non-farm uses by limiting any development to uses distinguished as dependent upon or accessory to supporting agricultural or forestry production and which qualify such farm lands for special tax relief pursuant to the provisions of Oregon Revised Statutes. This zone is also for the cultivation and marketing of specialty crops, horticultural crops and other intensive farm uses.

2. **(RESERVED)**

3. **Forest (F)**

The purpose of the "F" district is to designate forest lands and protect them for forest uses, except where findings establish that certain limited non-forest uses may be allowed. Some of the areas covered by the "F" zone are exclusive forest lands, while other areas include a combination of mixed farm and forest uses.

4. **(RESERVED)**

5. **(RESERVED)**

6. **Rural Residential (RR-5)**

The purpose of the "RR-5" district is to provide for acreage homesites outside of Urban Growth Boundaries (UGB), where a moderate intensity of land development is appropriate, but where urban services and facilities may not be available. The "RR-5" district provides for the orderly development of rural land so as to encourage the continued existence of rural family life and to provide a transition of densities between urban development and exclusive agricultural or forestry uses.

7. Rural Residential (RR-2)

The purpose of the “RR-2” district is to provide for small acreage homesites outside of Urban Growth Boundaries, where a moderate intensity of land development is appropriate, but where urban services and facilities may not be available or necessary. The “RR-2” district provides for continued existence of rural family life and to provide a transition of densities between urban development and exclusive agricultural and forestry uses.

8. Rural Center (RC)

The purpose of the “RC” district is:

- a. to provide for the development of rural commercial, tourist commercial, residential and services facilities, necessities, convenience and supplies ancillary to nearby agricultural, forestry, recreational and rural residential uses and activities; and
- b. to conserve energy by providing for needed commercial outlets in rural areas already “committed” as residential/commercial nodes.

New commercial uses that are consistent with the objectives of the “RC” district are those uses which are needed for the convenient shopping needs of the nearby rural population, and are compatible, or can be made compatible, with surrounding properties.

9. Urban Residential (UR-1)

The purpose of the “UR-1” district is to provide for urban residential areas that are exclusively limited to conventional single family dwellings. Detached conventional single family dwellings clustered in planned unit developments are consistent with the objectives of the “UR-1” district. This district shall only be used within Urban Growth Boundaries and Urban Unincorporated Community boundaries.

10. Urban Residential (UR-2)

The purpose of the “UR-2” district is to provide for urban residential areas that are designed to accommodate single family dwellings, mobile homes and two family dwellings. Clustered planned unit developments, including multi-family dwellings, are consistent with the objectives of the “UR-2” district.

The “UR-2” district shall only be used within Urban Growth Boundaries and Urban Unincorporated Community boundaries.

11. Urban Residential – Multi-family (UR-M)

The purpose of the “UR-M” district is to provide for high density urban residential areas necessary to accommodate opportunities for the construction of multiple-family dwellings, primarily necessary to meet the needs of low and moderate income families.

The “UR-M” district shall only be used within Urban Growth Boundaries and Urban Unincorporated Community boundaries.

12. Commercial (C-1)

The purpose of the “C-1” district is:

- a. to provide for needed commercial retail and service opportunities within Urban growth Boundaries;
- b. to recognize existing commercial uses outside Urban Growth Boundaries.

13. Industrial (IND)

The purpose of the “IND” district is to provide an adequate land Base necessary to meet industrial growth needs and to encourage diversification of the area’s economy accordingly. The “IND” district may be located without respect to Urban Growth Boundaries, as consistent with the Comprehensive Plan. The “IND” designation is appropriate for industrial parcels that are needed for development prior to the year 2000, as consistent with the Comprehensive Plan.

14. South Slough (SS)

The purpose of the “SS” district is to complement the primary management objectives and the primary scientific objectives of the South Slough Estuarine Sanctuary (SSES). This district is intended to maintain the integrity of the sanctuary by preserving the area for long-term scientific and educational uses.

15. Minor Estuary and Shorelands (MES)

The purpose of the “MES” district is to regulate uses within the inventoried minor estuaries and adjacent shorelands within unincorporated Coos County. The estuaries within the district are treated as “natural management units” per LCDC Goal 16.

16. Recreation (REC)

The purpose of the “REC” district is to accommodate recreational uses of areas with high recreational or open space value.

The district applies solely to areas designated as “Recreation” in the Comprehensive Plan, which include state, county and other municipal parks, the Oregon Dunes National Recreation Area, as well as private lands currently developed as golf courses.

New recreational developments in this district shall be oriented to the open space nature of the land. The type and intensity of recreational developments in this district must be conditioned by environmental considerations set forth in the County’s Coastal Shoreland/Dune Lands Comprehensive Plan policies where such developments are allowed in these coastal resource areas.

17. Controlled Development (CD-5)

The purpose of the “CD-5” district is to recognize the scenic and unique quality of selected areas within Urban Growth Boundaries, to enhance and protect the unique “village atmosphere”, to permit a mix of residential, commercial and recreational uses and to exclude those uses which would be inconsistent with the purpose of this district, recognizing tourism as a major component of the County’s economy.

18. Controlled Development (CD-10)

The purpose of the “CD-10” district is to recognize the scenic and unique quality of selected areas within Urban Growth Boundaries, to enhance and protect the unique “village atmosphere”, to permit a mix of residential, commercial and recreational uses and to exclude those uses which would be inconsistent with the purpose of this district, recognizing tourism as a major component of the County’s economy.

19. Airport Operation (AO)

The purpose of the Airport Operation “AO” district is to recognize those areas devoted to or most suitable for immediate operational facilities necessary for commercial and non-commercial aviation. It is also intended to provide areas for those activities directly supporting or dependent upon aircraft or air transportation when such activities, in order to function, require a location within or immediately adjacent to primary flight operations and passenger or cargo service facilities. In addition, the “AO” district is intended to provide areas for certain open space uses for airfield grounds maintenance and as a buffer to minimize potential dangers from, and conflicts with, the use of aircraft.

20. Bandon Dunes Resort (BDR)

The purpose of the Bandon Dunes Resort (BDR) zone is to implement an exception to the Statewide Planning Goals and a Master Plan for a destination resort that have been adopted as part of the Coos County Comprehensive Plan. [OR 96-04-006PL 9/11/96]

B. OVERLAY ZONES

1. Floodplain (/FP)

The purpose of the Floodplain Floating Zone is to protect public health and safety. The secondary aim is to improve the general welfare by reducing economic loss due to interruption of businesses and industry or damage to homes on other property. Development in a floodplain may constitute a “public nuisance” by reducing the flow-carrying capacity of the channel and thus endangering others.

2. Airport Surfaces (/AS)

The purpose of the airport Surfaces Floating Zone is to protect public health, safety and welfare. It is recognized that obstruction to aviation have a potential for endangering the lives and property of users of selected airports, and property of occupant of land in the airport’s vicinity; an obstruction may affect future instrument approach minimums; and obstructions may reduce the area available for the landing, take-off and maneuvering of aircraft, thus tending to destroy or impair the utility of the airport and the public investment therein.

C. CREMP SHORELAND SEGMENTS

Segment #:

#11 (Natural Resource Management) This segment shall be managed to protect the natural resources of this area (including a large fresh-water marsh), and for undeveloped outdoor recreation activities in conjunction with the Bullards Beach State Park. A designated dredged material site is located at the south end of this segment, and shall be protected from pre-emptive uses.

#12 (Recreation) This segment is part of Bullards Beach State Park and managed for outdoor recreation activities and facilities, as consistent with the plan of the State Parks Division and the recreational needs of the State and its visitors.

- #13** **(Forestry)** This segment shall be managed for forest uses, with special attention being given to protecting riparian vegetation.
- #14**for development of a dock and storage area for bulk material loading or similar low-intensity industrial use. Due consideration shall be given to minimizing noise or visual impacts on the adjacent State Park, and to protection of archaeological resources (see Policy #18).
- #15** This segment shall be managed to conserve the natural resources of this low-lying forested wetland area with special attention being given to protecting the riparian vegetation adjacent to the Bandon Marsh.
- #16**to continue its use as a mill or for other industrial uses, utilizing the existing dock and water access.
- #17**to conserve the natural resources of this low-lying forested wetland area, with special attention being given to protecting the riparian vegetation adjacent to the tidal marsh in Aquatic Segment #16.
- #18**to provide water access for residential lots fronting the river and for water-front residential development provided flood-protection and riparian vegetation requirements are met (see Policies #27 and #23).
- #19**to conserve this forested area, with special attention being given to protecting riparian vegetation.
- #20**to develop this area of historic water-front development for industrial and commercial uses connected with boat building, repair, port operations, moorage and other water-dependent or related uses.
- #22**to conserve this area of forested wetland for forest use, with special attention being given to protecting the riparian vegetation adjacent to the marsh in Aquatic Segment #20.
- #23**for the continuation of farm use as defined in ORS 215.203 (2) (a) and such other non-farm uses as are conditionally permitted in ORS 215.213. Mitigation shall also be permitted, and designated mitigation sites shall be protected against pre-emptory uses.
- #24**for recreational uses connected with the Rocky Point Boat Ramp, and other uses as permitted by the uses/activities matrix.

- #25**for the continuation of rural residential uses, provided flood protection requirements are met. (See Policy #27)
- #26**for the continuation of farm use as defined in ORS 215.203 (2) (a) and such other non-farm uses as are conditionally permitted in ORS 215.213. Mitigation shall also be permitted and designated mitigation sites shall be projected against pre-emptory uses.
- #27**for the continuation of farm use as defined in ORS 215.203 (2) (a) and such farm uses as are conditionally permitted in ORS 215.213.
- #28**for the continuation of farm use as defined in ORS 215.203 (2) (a) and such other farm uses as are conditionally permitted in ORS 215.213.
- #29**for the protection of its natural resource values as a mitigation site which shall be protected from pre-emptory uses.
- #30**to provide water access for residential lots fronting the river and for water-front residential development provided flood-protection and riparian vegetation requirements are met (see Policies #27 and #23).
- #31**for the continuation of farm use as defined in ORS 215.203 (2) (a) and such other farm uses as conditionally permitted in ORS 215.213.
- #32**for the continuation of farm use as defined in ORS 215.203 (2) (a) and such other farm uses as are conditionally permitted in ORS 215.213.
- #33**for the continuation of farm use as defined in ORS 215.203 (2) (a) and such other farm uses as are conditionally permitted in ORS 215.213.
- #34**for the continuation of farm use as defined in ORS 215.203 (2) (a) and such other farm uses as are conditionally permitted in ORS 215.213.
- #35**for forest uses and practices, subject to any special regulations the Oregon Department of Forestry may adopt for forest lands in the coastal shorelands area. Any development shall be subject to Policy #27a, addressing mass movement hazards.
- #36**for the continuation of farm use as defined in ORS 215.203 (2) (a) and such other farm uses as are conditionally permitted in ORS 215.213.

- #37for the continuation of farm use as defined in ORS 215.203(2)(a) and such other farm uses as are conditionally permitted in ORS 215.213.
- #38for forest uses and practices, subject to any special regulations the Oregon Department of forestry may adopt for forest lands in the Coastal Shorelands area. Any development shall be subject to Policy #27a, addressing mass movement hazards.
- #39for recreational uses connected with the Riverton Boat Ramp and other uses as permitted by the uses/activities matrix.
- #40for general industrial, commercial or other development particularly uses which utilize the water-frontage of the site. However, continuation and expansion of existing non-water-dependent/related uses shall be allowed.
- #41for the continuation of farm use as defined in ORS 215.203 (2)(a) and such other farm uses as are conditionally permitted in ORS 215.213.
- #42 for the continuation of farm use as defined in ORS 215.203 (2)(a) and such other farm uses as are conditionally permitted in ORS 215.213.
- #43 for the continuation of farm use as defined in ORS 215.203 (2)(a) and such other farm uses as are conditionally permitted in ORS 215.213.
- #44 for the continuation of farm use as defined in ORS 215.203 (2)(a) and such other farm uses as are conditionally permitted in ORS 215.213.
- #45for the continuation of industrial use including development of water access if necessary.
- #47 for the continuation of farm use as defined in ORS 215.203 (2) (a) and such other farm uses as are conditionally permitted in ORS 215.213.
- #50to provide water access for residential lots fronting the river and for water-front residential developments provided flood-protection and riparian vegetation requirements are met (see Policies #27 and #23).

- #51**for recreational uses connected with the Coquille Boat Ramp and other uses as permitted by the uses/activities matrix.
- #52**for the continuation and development industrial use, including the development of water access as necessary.
- #53**for the continuation of farm use as defined in ORS 215.203 (2) (a) and other such farm uses as are conditionally permitted in ORS 215.213.
- #54**for the continuation and development of industrial use, including the development of water access as necessary.
- #55**for the continuation of farm use as defined in ORS 215.203 (2) (a) and for such other farm uses as are conditionally permitted in ORS 215.213.
- #56**for the continuation of farm use as defined in ORS 215.203 (2) (a) and such other farm uses as are conditionally permitted in ORS 215.213.
- #57**for the continuation of residential and commercial uses as consistent with the rural center function of Arago, provided flood protection requirements are met. (see Policy #27)
- #58**for recreational uses connected with the Coquille Boat Ramp and other uses as permitted by the Uses/Activities matrix.
- #59**for the continuation and development of industrial use, including the development of water access as necessary.
- #60**for the continuation of farm use as defined in ORS 215.203 (2) (a) and such other farm uses as are conditionally permitted in ORS 215.213.
- #61**to provide water access for residential lots fronting the river and for water-front residential development provided flood-protection and riparian vegetation requirements are met (see Policies #27 and #23).
- #62** for the continuation of farm use as defined in ORS 215.203 (2)(a) and such other farm uses as are conditionally permitted in ORS 215.213.
- #63**to provide water access for residential lots fronting the river and for water-front residential development provided flood-protection

and riparian vegetation requirements are met (see Policies #27 & #23).

#73 for the continuation of farm use as defined in ORS 215.203 (2)(a) and such other farm uses as are conditionally permitted in ORS 215.213.

#74for the continuation of rural residential uses, provided flood-protection requirements are met (see Policy #27).

#75 for the continuation of farm use as defined in ORS 215.203 (2)(a) and such other farm uses as are conditionally permitted in ORS 215.213.

D. CREMP Aquatic Units. The CREMP zoning districts shall have the same boundaries as the Coquille River Estuary Management Plan unit boundaries and shall be so designated.

#8 This unit shall be managed to conserve and enhance the aquatic resources of the main river channel, while allowing such minor alterations as are necessary for shallow draft navigation.

#10to protect and enhance the natural resources of the Bandon Marsh as a wildlife refuge.

#11to protect and enhance the natural resources of these intertidal marshes for the purposes of estuarine production.

#12to conserve, and enhance the natural resources of these intertidal flats for the purposes of estuarine production.

#13to protect and enhance the natural resources of this intertidal flat for the purposes of estuarine production.

#14for dredging and bulkheading as necessary to develop a dock for bulk material shipping.

#15to conserve and enhance the natural resources of this intertidal area while allowing for the development of recreational docking or a small marina, including dredging as necessary.

#16to protect and enhance the natural resources of this intertidal marsh for the purposes of estuarine production.

#17to conserve and enhance the natural resources of this intertidal area while allowing for the continuation of recreational and

commercial docking facilities and maintenance dredging as necessary.

#18for the development of docking, boat building and repair and similar water dependent uses, including dredging and fill as necessary.

#19for the dredging and fill as necessary to develop a major recreational marina with ancillary services and facilities.

#20to conserve and enhance the natural resources of this intertidal marsh for the purposes of estuarine production, while allowing the continuation of existing grazing use.

#21to conserve and enhance to aquatic resources of the main river channel and fringing intertidal areas, while allowing such minor alterations as are necessary for the continuation of recreational boating and other shallow draft navigation. Removal of snags, old pilings and other obstructions from the river, and bank stabilization shall also be encouraged.

#22to conserve and enhance the natural resources, of these fringing intertidal marshes for the purposes of estuarine production.

#23to conserve and enhance the natural resources of Randolph Slough for the purposes of estuarine production.

#24to conserve and enhance the natural resources of this small intertidal marsh for the purposes of estuarine production.

#25to conserve and enhance the natural resources of the tidal portion of Bear Creek for the purposes of estuarine production.

SECTION 4.1.200. Zoning District Maps. The location and boundaries of the zoning districts designated in Section 4.1.100 are indicated on the Coos County Zoning Map, Coquille River Estuary Zoning Map and the Coos Bay Estuary Zoning Map. These zoning maps and their explanatory information are hereby adopted as part of this Ordinance. The zoning map may consist of several sheets or pages, which shall be listed on a cover page together with the date and name of each page. The zoning map shall be certified by the Board of Commissioners and County Clerk as being the official zoning map. The certification of the official zoning map shall appear on the cover page of the collection of zoning maps. There shall be only one official zoning map which shall be located in the office of the County Clerk as long as this Ordinance remains in effect.

SECTION 4.1.300. Amendment of Zoning District Map. Whenever it is necessary to amend the zoning map to conform with an approved rezoning or with an

amendment to the text of this Ordinance or as final land use actions of incorporated cities may require, the Planning Director shall so change the map, making such changes in red ink and annotating the map and the cover sheet to show the Ordinance or other number and the date of the change. (ORD 85-08-011L)

SECTION 4.1.400. Interpretation of Zoning District Boundaries. Due to the transposition of boundary lines from the Comprehensive Plan Maps (scale: 2" = 1 mile) to the Official Zoning Maps (scale 1"=800'), zoning district boundaries were drawn to the nearest 10 acres. Whenever an uncertainty exists as to the boundary of a zone as shown on the official zoning map, the following rules of interpretation shall apply:

1. Boundaries indicated as approximately following the centerlines of streets, highways, or alleys shall be construed to follow such centerlines;
2. Boundaries indicated as approximately following platted or surveyed lines shall be construed to follow such plat or survey lines;
3. Boundaries indicated as approximately following city limits shall be construed to follow such city limits;
4. Boundaries indicated as following railroad lines or public utility easements shall be construed to follow such line;
5. Boundaries indicated as following the centerlines of streams, rivers, canals, or other bodies of water shall be construed to follow those centerlines;
6. Boundaries indicated as approximately following the shorelines of water bodies shall be construed to follow the mean high water line (MHWL) or the line of non-aquatic vegetation, whichever is higher;
7. Boundaries indicated as approximately following ridge tops and other topographical features shall be construed to follow those features;
8. Boundaries indicated as approximately parallel to, or as extensions of features indicated in subsections 1 through 7, shall be so construed;
9. Where a public street or alley is officially vacated, the zone requirements applicable to the property in which the vacated area becomes a part shall apply;
10. Boundaries not intended to follow the above-listed features shall indicate where possible distances to reference points and other lines so they can be located on the ground;

11. Where physical features existing on the ground are at variance with those shown on the official zoning map, or in other circumstances not covered by subsections 1 through 10 above, the Planning Director shall interpret the zone boundaries, and if need be, may refer the matter to the Hearings Body for its interpretation pursuant to Section 1.1.700 of this Ordinance.

SECTION 4.1.450. Interpretation of Coastal Shorelands Boundary. When a development action is proposed in the immediate vicinity of the Coastal Shorelands Boundary (CSB) and when such proposed development action relies on a precise interpretation of the CSB, the Planning Director shall establish the precise location of the CSB using the seven criteria specified in the Coastal Shorelands goal. Establishment of the exact location may require an on-site inspection. If the location of the CSB as shown on the Plan maps or Coastal Shorelands Inventory map is subsequently found to be inaccurate or misleading, the Planning Director shall make the appropriate minor adjustments to the maps and provide a copy of any map revision to the County Clerk's office.

SECTION 4.1.500. Unzoned or Multi-zoned Land.

1. Any land which is unzoned or multi-zoned through inadvertence or oversight shall be reviewed by the Planning Director, and a recommendation of the appropriate zoning shall be made to the Hearings Body which shall make a recommendation to the Board of Commissioners, pursuant to the provisions of Section 1.1.700 of this Ordinance.
2. The Board of Commissioners, at a regular, special, or emergency meeting, shall determine the appropriate zone district pursuant to the provisions of Chapter 4 of this Ordinance.
3. Hearings required in Section 1.2.400 shall comply with the provisions of Article 5.7 of this Ordinance.
4. The Planning Director shall amend the zoning map to conform to the decision of the Board of Commissioners in accordance with the procedures set out in Section 4.1.300 of this Ordinance.

SECTION 4.1.600. (Reserved)

SECTION 4.1.700. Errors in Zoning District Maps.

1. The Planning Director shall periodically compare zone maps on file with the official zoning map and the action taken by the Board of Commissioners or Hearings Body to assure the maps conform therewith.

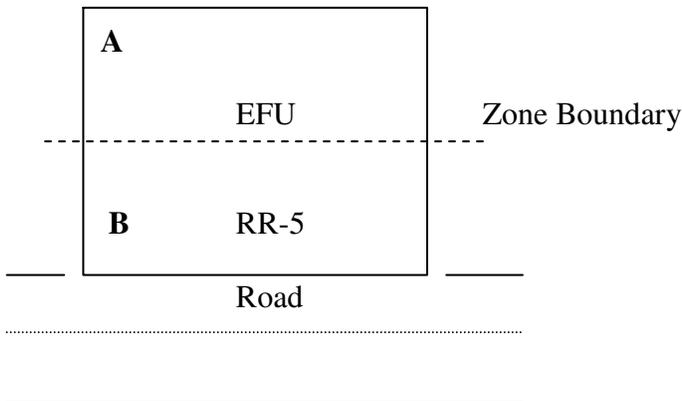
2. When errors in transcription, interpretation, or clerical mistakes are found, the Planning Director shall have the authority to correct those errors pursuant to Section 4.1.300 (Amendment of Map).

SECTION 4.1.800. Special Considerations Maps. The location of special hazards and resources are indicated on the Coos County Special Considerations Maps prepared for each volume (I, II, and III) of the Comprehensive Plan. These Special Considerations Maps are hereby adopted as part of this Ordinance. The Special Considerations Maps may consist of several sheets or pages, which shall be listed on a cover page together with the date and name of each page. The Special Considerations Maps are not a substitute for the detailed spatial information presented on the inventory maps. The Special Considerations Maps are merely index guides designed as zoning counter implementation tools that indicate when a special policy consideration applies in a general area, thereby requiring inspection of the detailed plan inventory maps. The Special Considerations Maps must and shall at all times accurately reflect the detail presented on the inventory maps (but at a more general scale). See Articles 4.7 and 4.8.

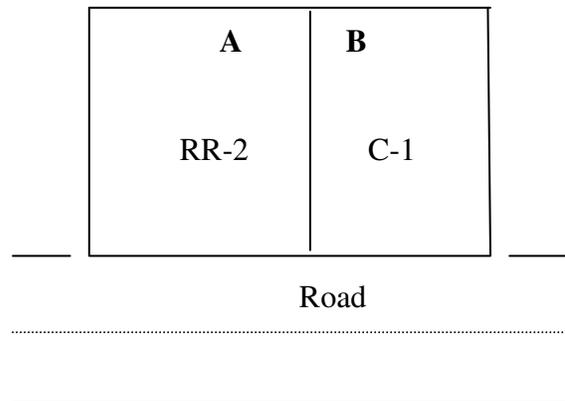
SECTION 4.1.900. Split Zoning. Split zoning occurs when a contiguous ownership is divided into two or more zoning districts.

1. For the purpose of establishing uses, each portion of the total contiguous ownership within an individual zoning district may be used for any use permitted by the applicable zoning district subject to Section 3.3.100.

Example 1



Example 2



In the example above, “A” may be used for any use allowed by the applicable zoning district irrespective of portions “B”. Likewise, portions “B” may be used for any use allowed by the applicable zoning district irrespective of portions “A”.

2. For the purpose of land division, the ownership of each portion of the total contiguous ownership within an individual zoning district may be transferred to another ownership, subject to:
 - A. A partition or subdivision submittal; and
 - B. Any required applicable findings; and
 - C. In addition to any other required findings, lands subject to the EFU or F zones shall be subject to the provisions of this section only if finding is made that the division of resource land shall be appropriate for the continuation of the existing commercial resource enterprise of the area.
[OR-92-07-012PL]

Appendix C



Title 17

ZONING

Chapters:

17.04	Introductory Provisions
17.08	Establishment of Zones
17.12	Residential 1 (R-1) Zone
17.16	Residential 2 (R-2) Zone
17.20	Controlled Development 1 (CD-1) Zone
17.24	Controlled Development 2 (CD-2) Zone
17.28	Controlled Development 3 (CD-3) Zone
17.32	Controlled Development Residential 1 (CD-R1) Zone
17.36	Controlled Development Residential 2 (CD-R2) Zone
17.40	Old Town Commercial (C-1) Zone
17.44	General Commercial (C-2) Zone
17.48	Marine Commercial (C-3) Zone
17.52	Light Industrial (LI) Zone
17.54	Woolen Mill Overlay Zone (WM) <i>(Repealed by Ord 1604)</i>
17.56	Heavy Industrial (HI) Zone
17.60	Public Facilities and Parks (PF) Zone
17.64	Water (W) Zone
17.68	Natural Resource and Open Space (NR) Zone
17.72	Historic-Cultural Overlay (HC) Zone
17.76	Shoreland Overlay (SO) Zone
17.77	Beaches and Dunes Overlay (BDO) Zone
17.84	Architectural Review Overlay (AR) Zone
17.88	Airport Overlay (AO) Zone
17.90	Signs
17.92	Conditional Uses
17.94	Commercial Design Standards
17.96	Off-Street Parking and Loading
17.98	Outdoor Lighting Regulations
17.100	Planned Unit Development
17.102	Wetland Protection Standards
17.103	Riparian Corridor Protection
17.104	Supplementary Provisions
17.108	Nonconforming Uses and Structures
17.112	Variances
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17.120	Administration and Enforcement
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Ordinance History: No. 868, 972, 1073, 1090, 1103, 1125, 1127, 1130, 1140, 1141, 1153, 1154, 1175, 1186, 1188, 1192, 1195, 1201, 1213, 1223, 1226, 1227, 1228, 1236, 1237, 1240, 1265, 1275, 1291, 1301, 1305, 1308, 1313, 1314, 1316, 1320, 1329, 1336, 1363, 1365, 1377, 1387, 1410, 1418, 1446, 1448, 1452, 1458, 1459, 1464, 1471, 1504, 1524, 1532, 1533, 1538, 1543, 1546, 1547, 1551, 1565, 1567, 1572, 1580, 1581, 1582, 1591, 1592, 1593, 1594, 1604, 1609

Chapter 17.88

AIRPORT OVERLAY (AO) ZONE

Sections:

17.88.010	Purpose.
17.88.020	Compliance.
17.88.030	Special definitions.
17.88.040	Permitted uses.
17.88.050	Conditional uses.
17.88.060	Procedures.
17.88.070	Limitations.

17.88.010 Purpose.

The airport overlay zone (AO) is intended to prevent the establishment of air space obstructions in airport approaches and surrounding area through height restrictions and other land use controls as deemed essential to protect the health, safety and welfare of the people of the city of Bandon and Coos County.

In order to carry out the provisions of this overlay zone there is created and established an airport overlay zone, which includes all of the land lying beneath the airport imaginary surfaces as they apply to the Bandon State Airport in Coos County. Such zones are shown on the current airport approach and clear. zone maps, which are made a part of this title. (Ord. 1336 § 6.600, 1994)

17.88.020 Compliance.

In addition to complying with the provisions of the primary zoning district, uses and activities shall comply with the provisions of this overlay zone. In the event of any conflict between any provisions of this overlay zone and the primary zoning districts, the more restrictive provision shall apply.

17.88.030 Special definitions.

As used in this chapter:

“Airport approach safety zone” means a surface longitudinally centered on the extended runway center line and extending outward and upward from each end of the primary surface. The inner edge of the approach surface is the same width as the primary surface and extends to a width of one thousand two hundred fifty (1,250) feet. The airport approach safety zone extends for a horizontal distance of five thousand (5,000) feet at a slope of twenty (20) feet outward for each foot upward (20:1).

“Airport hazard” means any structure, tree or use of land which exceeds height limits established by the airport imaginary surfaces.

“Airport imaginary surfaces” means those imaginary areas in space which are defined by the airport approach safety zone, transitional zones, horizontal zone, clear zone and conical surface and in which any object extending above these imaginary surfaces is an obstruction.

Clear Zone. The “clear zone” extends from the primary surface to a point where the approach surface is fifty (50) feet above the runway end.

Conical Surface. The “conical surface” extends twenty (20) feet outward for each one foot upward (20:1) for four thousand (4,000) feet beginning at the edge of the horizontal surface (five thousand (5,000) feet from the center of each end of the primary surface of each visual and utility runway at one hundred fifty (150) feet above the airport elevation) and upward extending to a height of three hundred fifty (350) feet above the airport elevation.

“Horizontal surface” means a horizontal plane one hundred fifty (150) feet above the

established airport elevation, the perimeter of which is constructed by swinging arcs of five thousand (5,000) feet from the center of each end of the primary surface of the runway and connecting the adjacent arcs by lines tangent to those arcs.

“Noise sensitive areas” means within one thousand five hundred (1,500) feet of the airport or within established noise contour boundaries exceeding fifty-five (55) Ldn.

“Place of public assembly” means a structure or place which the public may enter for such purposes as deliberation, education, worship, shopping, entertainment, amusement, awaiting transportation or similar activity.

“Primary surface” means a surface longitudinally centered on a runway. When the runway has a specially prepared hard surface, the primary surface extends two hundred (200) feet beyond each end of the runway. The width of the primary surface is five hundred (500) feet.

Transitional Zones. “Transitional zones” extend seven feet outward for each one foot upward (7:1) beginning on each side of the primary surface, and from the sides of the approach surfaces thence extending upward to a height of one hundred fifty (150) feet above the airport elevation (horizontal surface).

“Utility runway” means a runway that is constructed and intended to be used by propeller-driven aircraft of twelve thousand five hundred (12,500) pounds maximum gross weight or less.

17.88.040 Permitted uses.

Permitted uses within the airport approach safety zone include:

- A. Farm use, excluding the raising and feeding of animals which would be adversely affected by aircraft passing overhead;
- B. Landscape nursery, cemetery or recreation areas which do not include buildings or structures;
- C. Roadways, parking areas and storage yards located in such a manner that vehicle lights will not make it difficult for pilots to distinguish between landing lights and vehicle lights or result in glare, or in any way impair visibility in the vicinity of the landing approach. Approach surfaces must clear these by a minimum of fifteen (15) feet;
- D. Pipeline;
- E. Underground utility wire.

17.88.050 Conditional uses.

Conditional uses within the airport approach safety zone include:

- A. A structure or building accessory to a permitted use;
- B. Single-family dwellings, mobile home, manufactured dwelling, duplexes and multi-family dwellings, when authorized in the primary zoning district, provided the landowner signs and records in the deed and mortgage records of Coos County a hold harmless agreement and aviation and hazard easement and submits them to the airport sponsor and Bandon planning commission;
- C. Commercial and industrial uses, when authorized in the primary zoning district, provided the use does not result in the following:
 - 1. Creating electrical interference with navigational signals or radio communications between the airport and aircraft,
 - 2. Making it difficult for pilots to distinguish between airport lights or others,
 - 3. Impairing visibility,
 - 4. Creating bird strike hazards,
 - 5. Endangering or interfering with the landing, taking off or maneuvering of aircraft intending to use the airport,
 - 6. Attracting a large number of people;
 - 7. Building and uses of a public works, public service or public utility nature.

17.88.060 Procedures.

An applicant seeking a conditional use under Section 17.88.050, shall follow procedures set forth in the conditional use section of the city zoning ordinance (Chapter 17.92). Information accompanying the application shall also include the following:

- A. Property boundary lines as they relate to the airport imaginary surfaces;
- B. Location and height of all existing and proposed buildings, structures, utility lines and roads; and
- C. A notice shall be provided to the Department of Transportation, Aeronautics Division, for conditional use applications within five thousand (5,000) feet of the sides or ends of the runway. The applicant shall furnish a statement from the Oregon Aeronautics Division indicating that the proposed use will not interfere with operation of the landing facility.

17.88.070 Limitations.

- A. To meet the standards and reporting requirements established in FAA Regulations, Part 77, no structures shall penetrate into the airport imaginary surfaces as defined above under Section 17.88.030.
- B. No structure of public assembly shall be permitted in the airport approach safety zone.
- C. No structure or building shall be allowed within the clear zone.
- D. Whenever there is a conflict in height limitations prescribed by this overlay zone and the primary zoning district, the lowest height limitation fixed shall govern, provided, however, that the height limitations here imposed shall not apply to such structures customarily employed for aeronautical purposes.
- E. No glare-producing materials shall be used on the exterior of any structure located within the airport approach safety zone.
- F. In noise-sensitive areas (within one thousand five hundred (1,500) feet of an airport or within established noise contour boundaries of fifty-five (55) Ldn and above for identified airports) where noise levels are a concern, a declaration of anticipated noise levels shall be attached to any building permit or development approval. In areas where the noise level is anticipated to be fifty-five (55) Ldn and above, prior to issuance of a building permit for construction of noise-sensitive land use (real property normally used for sleeping or normally use as schools, churches, hospital or public libraries), the permit application shall be required to demonstrate that a noise abatement strategy will be incorporated into the building design which will achieve an indoor noise level equal to or less than forty-five (45) Ldn. The planning and building department will review building permits for noise sensitive developments.

Appendix D





ASSURANCES

Airport Sponsors

A. General.

1. These assurances shall be complied with in the performance of grant agreements for airport development, airport planning, and noise compatibility program grants for airport sponsors.
2. These assurances are required to be submitted as part of the project application by sponsors requesting funds under the provisions of Title 49, U.S.C., subtitle VII, as amended. As used herein, the term "public agency sponsor" means a public agency with control of a public-use airport; the term "private sponsor" means a private owner of a public-use airport; and the term "sponsor" includes both public agency sponsors and private sponsors.
3. Upon acceptance of this grant offer by the sponsor, these assurances are incorporated in and become part of this grant agreement.

B. Duration and Applicability.

1. **Airport development or Noise Compatibility Program Projects Undertaken by a Public Agency Sponsor.**

The terms, conditions and assurances of this grant agreement shall remain in full force and effect throughout the useful life of the facilities developed or equipment acquired for an airport development or noise compatibility program project, or throughout the useful life of the project items installed within a facility under a noise compatibility program project, but in any event not to exceed twenty (20) years from the date of acceptance of a grant offer of Federal funds for the project. However, there shall be no limit on the duration of the assurances regarding Exclusive Rights and Airport Revenue so long as the airport is used as an airport. There shall be no limit on the duration of the terms, conditions, and assurances with respect to real property acquired with federal funds. Furthermore, the duration of the Civil Rights assurance shall be specified in the assurances.

2. **Airport Development or Noise Compatibility Projects Undertaken by a Private Sponsor.**

The preceding paragraph 1 also applies to a private sponsor except that the useful life of project items installed within a facility or the useful life of the facilities developed or equipment acquired under an airport development or noise compatibility program project shall be no less than ten (10) years from the date of acceptance of Federal aid for the project.

3. **Airport Planning Undertaken by a Sponsor.**

Unless otherwise specified in this grant agreement, only Assurances 1, 2, 3, 5, 6, 13, 18, 25, 30, 32, 33, and 34 in Section C apply to planning projects. The terms, conditions, and assurances of this grant agreement shall remain in full force and effect during the life of the project; there shall be no limit on the duration of the assurances regarding Airport Revenue so long as the airport is used as an airport.

C. Sponsor Certification.

The sponsor hereby assures and certifies, with respect to this grant that:

1. **General Federal Requirements.**

It 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 for this project including but not limited to the following:

Federal Legislation

- a. Title 49, U.S.C., subtitle VII, as amended.
- b. Davis-Bacon Act - 40 U.S.C. 276(a), et seq.¹
- c. Federal Fair Labor Standards Act - 29 U.S.C. 201, et seq.
- d. Hatch Act – 5 U.S.C. 1501, et seq.²
- e. Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 Title 42 U.S.C. 4601, et seq.^{1 2}
- f. National Historic Preservation Act of 1966 - Section 106 - 16 U.S.C. 470(f).¹
- g. Archeological and Historic Preservation Act of 1974 - 16 U.S.C. 469 through 469c.¹
- h. Native Americans Grave Repatriation Act - 25 U.S.C. Section 3001, et seq.
- i. Clean Air Act, P.L. 90-148, as amended.
- j. Coastal Zone Management Act, P.L. 93-205, as amended.
- k. Flood Disaster Protection Act of 1973 - Section 102(a) - 42 U.S.C. 4012a.¹
- l. Title 49, U.S.C., Section 303, (formerly known as Section 4(f))
- m. Rehabilitation Act of 1973 - 29 U.S.C. 794.
- n. Title VI of the Civil Rights Act of 1964 (42 U.S.C. § 2000d et seq., 78 stat. 252) (prohibits discrimination on the basis of race, color, national origin);
- o. Americans with Disabilities Act of 1990, as amended, (42 U.S.C. § 12101 et seq.), prohibits discrimination on the basis of disability).
- p. Age Discrimination Act of 1975 - 42 U.S.C. 6101, et seq.
- q. American Indian Religious Freedom Act, P.L. 95-341, as amended.
- r. Architectural Barriers Act of 1968 -42 U.S.C. 4151, et seq.¹
- s. Power plant and Industrial Fuel Use Act of 1978 - Section 403- 2 U.S.C. 8373.¹
- t. Contract Work Hours and Safety Standards Act - 40 U.S.C. 327, et seq.¹
- u. Copeland Anti-kickback Act - 18 U.S.C. 874.1
- v. National Environmental Policy Act of 1969 - 42 U.S.C. 4321, et seq.¹
- w. Wild and Scenic Rivers Act, P.L. 90-542, as amended.
- x. Single Audit Act of 1984 - 31 U.S.C. 7501, et seq.²
- y. Drug-Free Workplace Act of 1988 - 41 U.S.C. 702 through 706.

- z. The Federal Funding Accountability and Transparency Act of 2006, as amended (Pub. L. 109-282, as amended by section 6202 of Pub. L. 110-252).

Executive Orders

- a. Executive Order 11246 - Equal Employment Opportunity¹
- b. Executive Order 11990 - Protection of Wetlands
- c. Executive Order 11998 – Flood Plain Management
- d. Executive Order 12372 - Intergovernmental Review of Federal Programs
- e. Executive Order 12699 - Seismic Safety of Federal and Federally Assisted New Building Construction¹
- f. Executive Order 12898 - Environmental Justice

Federal Regulations

- a. 2 CFR Part 180 - OMB Guidelines to Agencies on Governmentwide Debarment and Suspension (Nonprocurement).
- b. 2 CFR Part 200, Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards. [OMB Circular A-87 Cost Principles Applicable to Grants and Contracts with State and Local Governments, and OMB Circular A-133 - Audits of States, Local Governments, and Non-Profit Organizations].^{4, 5, 6}
- c. 2 CFR Part 1200 – Nonprocurement Suspension and Debarment
- d. 14 CFR Part 13 - Investigative and Enforcement Procedures 14 CFR Part 16 - Rules of Practice For Federally Assisted Airport Enforcement Proceedings.
- e. 14 CFR Part 150 - Airport noise compatibility planning.
- f. 28 CFR Part 35- Discrimination on the Basis of Disability in State and Local Government Services.
- g. 28 CFR § 50.3 - U.S. Department of Justice Guidelines for Enforcement of Title VI of the Civil Rights Act of 1964.
- h. 29 CFR Part 1 - Procedures for predetermination of wage rates.¹
- i. 29 CFR Part 3 - Contractors and subcontractors on public building or public work financed in whole or part by loans or grants from the United States.¹
- j. 29 CFR Part 5 - Labor standards provisions applicable to contracts covering federally financed and assisted construction (also labor standards provisions applicable to non-construction contracts subject to the Contract Work Hours and Safety Standards Act).¹
- k. 41 CFR Part 60 - Office of Federal Contract Compliance Programs, Equal Employment Opportunity, Department of Labor (Federal and federally assisted contracting requirements).¹
- l. 49 CFR Part 18 - Uniform administrative requirements for grants and cooperative agreements to state and local governments.³
- m. 49 CFR Part 20 - New restrictions on lobbying.
- n. 49 CFR Part 21 – Nondiscrimination in federally-assisted programs of the Department of Transportation - effectuation of Title VI of the Civil Rights Act of 1964.
- o. 49 CFR Part 23 - Participation by Disadvantage Business Enterprise in Airport Concessions.

- p. 49 CFR Part 24 – Uniform Relocation Assistance and Real Property Acquisition for Federal and Federally Assisted Programs.^{1 2}
- q. 49 CFR Part 26 – Participation by Disadvantaged Business Enterprises in Department of Transportation Programs.
- r. 49 CFR Part 27 – Nondiscrimination on the Basis of Handicap in Programs and Activities Receiving or Benefiting from Federal Financial Assistance.¹
- s. 49 CFR Part 28 – Enforcement of Nondiscrimination on the Basis of Handicap in Programs or Activities conducted by the Department of Transportation.
- t. 49 CFR Part 30 - Denial of public works contracts to suppliers of goods and services of countries that deny procurement market access to U.S. contractors.
- u. 49 CFR Part 32 – Governmentwide Requirements for Drug-Free Workplace (Financial Assistance)
- v. 49 CFR Part 37 – Transportation Services for Individuals with Disabilities (ADA).
- w. 49 CFR Part 41 - Seismic safety of Federal and federally assisted or regulated new building construction.

Specific Assurances

Specific assurances required to be included in grant agreements by any of the above laws, regulations or circulars are incorporated by reference in this grant agreement.

Footnotes to Assurance C.1.

¹ These laws do not apply to airport planning sponsors.

² These laws do not apply to private sponsors.

³ 49 CFR Part 18 and 2 CFR Part 200 contain requirements for State and Local Governments receiving Federal assistance. Any requirement levied upon State and Local Governments by this regulation and circular shall also be applicable to private sponsors receiving Federal assistance under Title 49, United States Code.

⁴ On December 26, 2013 at 78 FR 78590, the Office of Management and Budget (OMB) issued the Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards in 2 CFR Part 200. 2 CFR Part 200 replaces and combines the former Uniform Administrative Requirements for Grants (OMB Circular A-102 and Circular A-110 or 2 CFR Part 215 or Circular) as well as the Cost Principles (Circulars A-21 or 2 CFR part 220; Circular A-87 or 2 CFR part 225; and A-122, 2 CFR part 230). Additionally it replaces Circular A-133 guidance on the Single Annual Audit. In accordance with 2 CFR section 200.110, the standards set forth in Part 200 which affect administration of Federal awards issued by Federal agencies become effective once implemented by Federal agencies or when any future amendment to this Part becomes final. Federal agencies, including the Department of Transportation, must implement the policies and procedures applicable to Federal awards by promulgating a regulation to be effective by December 26, 2014 unless different provisions are required by statute or approved by OMB.

⁵ Cost principles established in 2 CFR part 200 subpart E must be used as guidelines for determining the eligibility of specific types of expenses.

⁶ Audit requirements established in 2 CFR part 200 subpart F are the guidelines for audits.

2. Responsibility and Authority of the Sponsor.

a. Public Agency Sponsor:

It has legal authority to apply for this grant, and to finance and carry out the proposed project; that a resolution, motion or similar action has been duly adopted or passed as an official act of the applicant's governing body authorizing the filing of the application, including all understandings and assurances contained therein, and directing and authorizing the person identified as the official representative of the applicant to act in connection with the application and to provide such additional information as may be required.

b. Private Sponsor:

It has legal authority to apply for this grant and to finance and carry out the proposed project and comply with all terms, conditions, and assurances of this grant agreement. It shall designate an official representative and shall in writing direct and authorize that person to file this application, including all understandings and assurances contained therein; to act in connection with this application; and to provide such additional information as may be required.

3. Sponsor Fund Availability.

It has sufficient funds available for that portion of the project costs which are not to be paid by the United States. It has sufficient funds available to assure operation and maintenance of items funded under this grant agreement which it will own or control.

4. Good Title.

a. It, a public agency or the Federal government, holds good title, satisfactory to the Secretary, to the landing area of the airport or site thereof, or will give assurance satisfactory to the Secretary that good title will be acquired.

b. For noise compatibility program projects to be carried out on the property of the sponsor, it holds good title satisfactory to the Secretary to that portion of the property upon which Federal funds will be expended or will give assurance to the Secretary that good title will be obtained.

5. Preserving Rights and Powers.

a. It will not take or permit any action which would operate to deprive it of any of the rights and powers necessary to perform any or all of the terms, conditions, and assurances in this grant agreement without the written approval of the Secretary, and will act promptly to acquire, extinguish or modify any outstanding rights or claims of right of others which would interfere with such performance by the sponsor. This shall be done in a manner acceptable to the Secretary.

- b. It will not sell, lease, encumber, or otherwise transfer or dispose of any part of its title or other interests in the property shown on Exhibit A to this application or, for a noise compatibility program project, that portion of the property upon which Federal funds have been expended, for the duration of the terms, conditions, and assurances in this grant agreement without approval by the Secretary. If the transferee is found by the Secretary to be eligible under Title 49, United States Code, to assume the obligations of this grant agreement and to have the power, authority, and financial resources to carry out all such obligations, the sponsor shall insert in the contract or document transferring or disposing of the sponsor's interest, and make binding upon the transferee all of the terms, conditions, and assurances contained in this grant agreement.
- c. For all noise compatibility program projects which are to be carried out by another unit of local government or are on property owned by a unit of local government other than the sponsor, it will enter into an agreement with that government. Except as otherwise specified by the Secretary, that agreement shall obligate that government to the same terms, conditions, and assurances that would be applicable to it if it applied directly to the FAA for a grant to undertake the noise compatibility program project. That agreement and changes thereto must be satisfactory to the Secretary. It will take steps to enforce this agreement against the local government if there is substantial non-compliance with the terms of the agreement.
- d. For noise compatibility program projects to be carried out on privately owned property, it will enter into an agreement with the owner of that property which includes provisions specified by the Secretary. It will take steps to enforce this agreement against the property owner whenever there is substantial non-compliance with the terms of the agreement.
- e. If the sponsor is a private sponsor, it will take steps satisfactory to the Secretary to ensure that the airport will continue to function as a public-use airport in accordance with these assurances for the duration of these assurances.
- f. If an arrangement is made for management and operation of the airport by any agency or person other than the sponsor or an employee of the sponsor, the sponsor will reserve sufficient rights and authority to insure that the airport will be operated and maintained in accordance Title 49, United States Code, the regulations and the terms, conditions and assurances in this grant agreement and shall insure that such arrangement also requires compliance therewith.
- g. Sponsors of commercial service airports will not permit or enter into any arrangement that results in permission for the owner or tenant of a property used as a residence, or zoned for residential use, to taxi an aircraft between that property and any location on airport. Sponsors of general aviation airports entering into any arrangement that results in permission for the owner of residential real property adjacent to or near the airport must comply with the requirements of Sec. 136 of Public Law 112-95 and the sponsor assurances.

6. Consistency with Local Plans.

The project is reasonably consistent with plans (existing at the time of submission of this application) of public agencies that are authorized by the State in which the project is located to plan for the development of the area surrounding the airport.

7. Consideration of Local Interest.

It has given fair consideration to the interest of communities in or near where the project may be located.

8. Consultation with Users.

In making a decision to undertake any airport development project under Title 49, United States Code, it has undertaken reasonable consultations with affected parties using the airport at which project is proposed.

9. Public Hearings.

In projects involving the location of an airport, an airport runway, or a major runway extension, it has afforded the opportunity for public hearings for the purpose of considering the economic, social, and environmental effects of the airport or runway location and its consistency with goals and objectives of such planning as has been carried out by the community and it shall, when requested by the Secretary, submit a copy of the transcript of such hearings to the Secretary. Further, for such projects, it has on its management board either voting representation from the communities where the project is located or has advised the communities that they have the right to petition the Secretary concerning a proposed project.

10. Metropolitan Planning Organization.

In projects involving the location of an airport, an airport runway, or a major runway extension at a medium or large hub airport, the sponsor has made available to and has provided upon request to the metropolitan planning organization in the area in which the airport is located, if any, a copy of the proposed amendment to the airport layout plan to depict the project and a copy of any airport master plan in which the project is described or depicted.

11. Pavement Preventive Maintenance.

With respect to a project approved after January 1, 1995, for the replacement or reconstruction of pavement at the airport, it assures or certifies that it has implemented an effective airport pavement maintenance-management program and it assures that it will use such program for the useful life of any pavement constructed, reconstructed or repaired with Federal financial assistance at the airport. It will provide such reports on pavement condition and pavement management programs as the Secretary determines may be useful.

12. Terminal Development Prerequisites.

For projects which include terminal development at a public use airport, as defined in Title 49, it has, on the date of submittal of the project grant application, all the safety equipment required for certification of such airport under section 44706 of Title 49, United States Code, and all the security equipment required by rule or regulation, and

has provided for access to the passenger enplaning and deplaning area of such airport to passengers enplaning and deplaning from aircraft other than air carrier aircraft.

13. Accounting System, Audit, and Record Keeping Requirements.

- a. It shall keep all project accounts and records which fully disclose the amount and disposition by the recipient of the proceeds of this grant, the total cost of the project in connection with which this grant is given or used, and the amount or nature of that portion of the cost of the project supplied by other sources, and such other financial records pertinent to the project. The accounts and records shall be kept in accordance with an accounting system that will facilitate an effective audit in accordance with the Single Audit Act of 1984.
- b. It shall make available to the Secretary and the Comptroller General of the United States, or any of their duly authorized representatives, for the purpose of audit and examination, any books, documents, papers, and records of the recipient that are pertinent to this grant. The Secretary may require that an appropriate audit be conducted by a recipient. In any case in which an independent audit is made of the accounts of a sponsor relating to the disposition of the proceeds of a grant or relating to the project in connection with which this grant was given or used, it shall file a certified copy of such audit with the Comptroller General of the United States not later than six (6) months following the close of the fiscal year for which the audit was made.

14. Minimum Wage Rates.

It shall include, in all contracts in excess of \$2,000 for work on any projects funded under this grant agreement which involve labor, provisions establishing minimum rates of wages, to be predetermined by the Secretary of Labor, in accordance with the Davis-Bacon Act, as amended (40 U.S.C. 276a-276a-5), which contractors shall pay to skilled and unskilled labor, and such minimum rates shall be stated in the invitation for bids and shall be included in proposals or bids for the work.

15. Veteran's Preference.

It shall include in all contracts for work on any project funded under this grant agreement which involve labor, such provisions as are necessary to insure that, in the employment of labor (except in executive, administrative, and supervisory positions), preference shall be given to Vietnam era veterans, Persian Gulf veterans, Afghanistan-Iraq war veterans, disabled veterans, and small business concerns owned and controlled by disabled veterans as defined in Section 47112 of Title 49, United States Code. However, this preference shall apply only where the individuals are available and qualified to perform the work to which the employment relates.

16. Conformity to Plans and Specifications.

It will execute the project subject to plans, specifications, and schedules approved by the Secretary. Such plans, specifications, and schedules shall be submitted to the Secretary prior to commencement of site preparation, construction, or other performance under this grant agreement, and, upon approval of the Secretary, shall be incorporated into this grant agreement. Any modification to the approved plans,

specifications, and schedules shall also be subject to approval of the Secretary, and incorporated into this grant agreement.

17. Construction Inspection and Approval.

It will provide and maintain competent technical supervision at the construction site throughout the project to assure that the work conforms to the plans, specifications, and schedules approved by the Secretary for the project. It shall subject the construction work on any project contained in an approved project application to inspection and approval by the Secretary and such work shall be in accordance with regulations and procedures prescribed by the Secretary. Such regulations and procedures shall require such cost and progress reporting by the sponsor or sponsors of such project as the Secretary shall deem necessary.

18. Planning Projects.

In carrying out planning projects:

- a. It will execute the project in accordance with the approved program narrative contained in the project application or with the modifications similarly approved.
- b. It will furnish the Secretary with such periodic reports as required pertaining to the planning project and planning work activities.
- c. It will include in all published material prepared in connection with the planning project a notice that the material was prepared under a grant provided by the United States.
- d. It will make such material available for examination by the public, and agrees that no material prepared with funds under this project shall be subject to copyright in the United States or any other country.
- e. It will give the Secretary unrestricted authority to publish, disclose, distribute, and otherwise use any of the material prepared in connection with this grant.
- f. It will grant the Secretary the right to disapprove the sponsor's employment of specific consultants and their subcontractors to do all or any part of this project as well as the right to disapprove the proposed scope and cost of professional services.
- g. It will grant the Secretary the right to disapprove the use of the sponsor's employees to do all or any part of the project.
- h. It understands and agrees that the Secretary's approval of this project grant or the Secretary's approval of any planning material developed as part of this grant does not constitute or imply any assurance or commitment on the part of the Secretary to approve any pending or future application for a Federal airport grant.

19. Operation and Maintenance.

- a. The airport and all facilities which are necessary to serve the aeronautical users of the airport, other than facilities owned or controlled by the United States, shall be operated at all times in a safe and serviceable condition and in accordance with the minimum standards as may be required or prescribed by applicable Federal,

state and local agencies for maintenance and operation. It will not cause or permit any activity or action thereon which would interfere with its use for airport purposes. It will suitably operate and maintain the airport and all facilities thereon or connected therewith, with due regard to climatic and flood conditions. Any proposal to temporarily close the airport for non-aeronautical purposes must first be approved by the Secretary. In furtherance of this assurance, the sponsor will have in effect arrangements for-

- 1) Operating the airport's aeronautical facilities whenever required;
 - 2) Promptly marking and lighting hazards resulting from airport conditions, including temporary conditions; and
 - 3) Promptly notifying airmen of any condition affecting aeronautical use of the airport. Nothing contained herein shall be construed to require that the airport be operated for aeronautical use during temporary periods when snow, flood or other climatic conditions interfere with such operation and maintenance. Further, nothing herein shall be construed as requiring the maintenance, repair, restoration, or replacement of any structure or facility which is substantially damaged or destroyed due to an act of God or other condition or circumstance beyond the control of the sponsor.
- b. It will suitably operate and maintain noise compatibility program items that it owns or controls upon which Federal funds have been expended.

20. Hazard Removal and Mitigation.

It will take appropriate action to assure that such terminal airspace as is required to protect instrument and visual operations to the airport (including established minimum flight altitudes) will be adequately cleared and protected by removing, lowering, relocating, marking, or lighting or otherwise mitigating existing airport hazards and by preventing the establishment or creation of future airport hazards.

21. Compatible Land Use.

It will take appropriate action, to the extent reasonable, including 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, including landing and takeoff of aircraft. In addition, if the project is for noise compatibility program implementation, it will not cause or permit any change in land use, within its jurisdiction, that will reduce its compatibility, with respect to the airport, of the noise compatibility program measures upon which Federal funds have been expended.

22. Economic Nondiscrimination.

- a. It 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, including commercial aeronautical activities offering services to the public at the airport.
- b. In any agreement, contract, lease, or other arrangement under which a right or privilege at the airport is granted to any person, firm, or corporation to conduct or

to engage in any aeronautical activity for furnishing services to the public at the airport, the sponsor will insert and enforce provisions requiring the contractor to-

- 1) furnish said services on a reasonable, and not unjustly discriminatory, basis to all users thereof, and
 - 2) charge reasonable, and not unjustly discriminatory, prices for each unit or service, provided that the contractor may be allowed to make reasonable and nondiscriminatory discounts, rebates, or other similar types of price reductions to volume purchasers.
- c. Each fixed-based operator at the airport shall be subject to the same rates, fees, rentals, and other charges as are uniformly applicable to all other fixed-based operators making the same or similar uses of such airport and utilizing the same or similar facilities.
 - d. Each air carrier using such airport shall have the right to service itself or to use any fixed-based operator that is authorized or permitted by the airport to serve any air carrier at such airport.
 - e. Each air carrier using such airport (whether as a tenant, non-tenant, or subtenant of another air carrier tenant) shall be subject to such nondiscriminatory and substantially comparable rules, regulations, conditions, rates, fees, rentals, and other charges with respect to facilities directly and substantially related to providing air transportation as are applicable to all such air carriers which make similar use of such airport and utilize similar facilities, subject to reasonable classifications such as tenants or non-tenants and signatory carriers and non-signatory carriers. Classification or status as tenant or signatory shall not be unreasonably withheld by any airport provided an air carrier assumes obligations substantially similar to those already imposed on air carriers in such classification or status.
 - f. It will not exercise or grant any right or privilege which operates to prevent any person, firm, or corporation operating aircraft on the airport from performing any services on its own aircraft with its own employees [including, but not limited to maintenance, repair, and fueling] that it may choose to perform.
 - g. In the event the sponsor itself exercises any of the rights and privileges referred to in this assurance, the services involved will be provided on the same conditions as would apply to the furnishing of such services by commercial aeronautical service providers authorized by the sponsor under these provisions.
 - h. The sponsor may establish such reasonable, and not unjustly discriminatory, conditions to be met by all users of the airport as may be necessary for the safe and efficient operation of the airport.
 - i. The sponsor may prohibit or limit any given type, kind or class of aeronautical use of the airport if such action is necessary for the safe operation of the airport or necessary to serve the civil aviation needs of the public.

23. Exclusive Rights.

It will permit no exclusive right for the use of the airport by any person providing, or intending to provide, aeronautical services to the public. For purposes of this paragraph, the providing of the services at an airport by a single fixed-based operator shall not be construed as an exclusive right if both of the following apply:

- a. It would be unreasonably costly, burdensome, or impractical for more than one fixed-based operator to provide such services, and
- b. If allowing more than one fixed-based operator to provide such services would require the reduction of space leased pursuant to an existing agreement between such single fixed-based operator and such airport. It further agrees that it will not, either directly or indirectly, grant or permit any person, firm, or corporation, the exclusive right at the airport to conduct any aeronautical activities, including, but not limited to charter flights, pilot training, aircraft rental and sightseeing, aerial photography, crop dusting, aerial advertising and surveying, air carrier operations, aircraft sales and services, sale of aviation petroleum products whether or not conducted in conjunction with other aeronautical activity, repair and maintenance of aircraft, sale of aircraft parts, and any other activities which because of their direct relationship to the operation of aircraft can be regarded as an aeronautical activity, and that it will terminate any exclusive right to conduct an aeronautical activity now existing at such an airport before the grant of any assistance under Title 49, United States Code.

24. Fee and Rental Structure.

It will maintain a fee and rental structure for the facilities and services at the airport which will make the airport as self-sustaining as possible under the circumstances existing at the particular airport, taking into account such factors as the volume of traffic and economy of collection. No part of the Federal share of an airport development, airport planning or noise compatibility project for which a grant is made under Title 49, United States Code, the Airport and Airway Improvement Act of 1982, the Federal Airport Act or the Airport and Airway Development Act of 1970 shall be included in the rate basis in establishing fees, rates, and charges for users of that airport.

25. Airport Revenues.

- a. All revenues generated by the airport and any local taxes on aviation fuel established after December 30, 1987, will be expended by it for the capital or operating costs of the airport; the local airport system; or other local facilities which are owned or operated by the owner or operator of the airport and which are directly and substantially related to the actual air transportation of passengers or property; or for noise mitigation purposes on or off the airport. The following exceptions apply to this paragraph:
 - 1) If covenants or assurances in debt obligations issued before September 3, 1982, by the owner or operator of the airport, or provisions enacted before September 3, 1982, in governing statutes controlling the owner or operator's financing, provide for the use of the revenues from any of the airport owner or

operator's facilities, including the airport, to support not only the airport but also the airport owner or operator's general debt obligations or other facilities, then this limitation on the use of all revenues generated by the airport (and, in the case of a public airport, local taxes on aviation fuel) shall not apply.

- 2) If the Secretary approves the sale of a privately owned airport to a public sponsor and provides funding for any portion of the public sponsor's acquisition of land, this limitation on the use of all revenues generated by the sale shall not apply to certain proceeds from the sale. This is conditioned on repayment to the Secretary by the private owner of an amount equal to the remaining unamortized portion (amortized over a 20-year period) of any airport improvement grant made to the private owner for any purpose other than land acquisition on or after October 1, 1996, plus an amount equal to the federal share of the current fair market value of any land acquired with an airport improvement grant made to that airport on or after October 1, 1996.
 - 3) Certain revenue derived from or generated by mineral extraction, production, lease, or other means at a general aviation airport (as defined at Section 47102 of title 49 United States Code), if the FAA determines the airport sponsor meets the requirements set forth in Sec. 813 of Public Law 112-95.
- b. As part of the annual audit required under the Single Audit Act of 1984, the sponsor will direct that the audit will review, and the resulting audit report will provide an opinion concerning, the use of airport revenue and taxes in paragraph (a), and indicating whether funds paid or transferred to the owner or operator are paid or transferred in a manner consistent with Title 49, United States Code and any other applicable provision of law, including any regulation promulgated by the Secretary or Administrator.
 - c. Any civil penalties or other sanctions will be imposed for violation of this assurance in accordance with the provisions of Section 47107 of Title 49, United States Code.

26. Reports and Inspections.

It will:

- a. submit to the Secretary such annual or special financial and operations reports as the Secretary may reasonably request and make such reports available to the public; make available to the public at reasonable times and places a report of the airport budget in a format prescribed by the Secretary;
- b. for airport development projects, make the airport and all airport records and documents affecting the airport, including deeds, leases, operation and use agreements, regulations and other instruments, available for inspection by any duly authorized agent of the Secretary upon reasonable request;
- c. for noise compatibility program projects, make records and documents relating to the project and continued compliance with the terms, conditions, and assurances of this grant agreement including deeds, leases, agreements, regulations, and other instruments, available for inspection by any duly authorized agent of the Secretary upon reasonable request; and

- d. in a format and time prescribed by the Secretary, provide to the Secretary and make available to the public following each of its fiscal years, an annual report listing in detail:
 - 1) all amounts paid by the airport to any other unit of government and the purposes for which each such payment was made; and
 - 2) all services and property provided by the airport to other units of government and the amount of compensation received for provision of each such service and property.

27. Use by Government Aircraft.

It will 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 in common with other aircraft at all times without charge, except, 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. Unless otherwise determined by the Secretary, or otherwise agreed to by the sponsor and the using agency, substantial use of an airport by Government aircraft will be considered to exist when operations of such aircraft are in excess of those which, in the opinion of the Secretary, would unduly interfere with use of the landing areas by other authorized aircraft, or during any calendar month that –

- a. Five (5) or more Government aircraft are regularly based at the airport or on land adjacent thereto; or
- b. The total number of movements (counting each landing as a movement) of Government aircraft is 300 or more, or the gross accumulative weight of Government aircraft using the airport (the total movement of Government aircraft multiplied by gross weights of such aircraft) is in excess of five million pounds.

28. Land for Federal Facilities.

It will furnish without cost to the Federal Government for use in connection with any air traffic control or air navigation activities, or weather-reporting and communication activities related to air traffic control, any areas of land or water, or estate therein, or rights in buildings of the sponsor as the Secretary considers necessary or desirable for construction, operation, and maintenance at Federal expense of space or facilities for such purposes. Such areas or any portion thereof will be made available as provided herein within four months after receipt of a written request from the Secretary.

29. Airport Layout Plan.

- a. It will keep up to date at all times an airport layout plan of the airport showing
 - 1) boundaries of the airport and all proposed additions thereto, together with the boundaries of all offsite areas owned or controlled by the sponsor for airport purposes and proposed additions thereto;
 - 2) the location and nature of all existing and proposed airport facilities and structures (such as runways, taxiways, aprons, terminal buildings, hangars and

roads), including all proposed extensions and reductions of existing airport facilities;

- 3) the location of all existing and proposed nonaviation areas and of all existing improvements thereon; and
 - 4) all proposed and existing access points used to taxi aircraft across the airport's property boundary. Such airport layout plans and each amendment, revision, or modification thereof, shall be subject to the approval of the Secretary which approval shall be evidenced by the signature of a duly authorized representative of the Secretary on the face of the airport layout plan. The sponsor will not make or permit any changes or alterations in the airport or any of its facilities which are not in conformity with the airport layout plan as approved by the Secretary and which might, in the opinion of the Secretary, adversely affect the safety, utility or efficiency of the airport.
- b. If a change or alteration in the airport or the facilities is made which the Secretary determines adversely affects the safety, utility, or efficiency of any federally owned, leased, or funded property on or off the airport and which is not in conformity with the airport layout plan as approved by the Secretary, the owner or operator will, if requested, by the Secretary (1) eliminate such adverse effect in a manner approved by the Secretary; or (2) bear all costs of relocating such property (or replacement thereof) to a site acceptable to the Secretary and all costs of restoring such property (or replacement thereof) to the level of safety, utility, efficiency, and cost of operation existing before the unapproved change in the airport or its facilities except in the case of a relocation or replacement of an existing airport facility due to a change in the Secretary's design standards beyond the control of the airport sponsor.

30. Civil Rights.

It will promptly take any measures necessary to ensure that no person in the United States shall, on the grounds of race, creed, color, national origin, sex, age, or disability be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination in any activity conducted with, or benefiting from, funds received from this grant.

- a. Using the definitions of activity, facility and program as found and defined in §§ 21.23 (b) and 21.23 (e) of 49 CFR § 21, the sponsor will facilitate all programs, operate all facilities, or conduct all programs in compliance with all non-discrimination requirements imposed by, or pursuant to these assurances.
- b. Applicability
 - 1) Programs and Activities. If the sponsor has received a grant (or other federal assistance) for any of the sponsor's program or activities, these requirements extend to all of the sponsor's programs and activities.
 - 2) Facilities. Where it receives a grant or other federal financial assistance to construct, expand, renovate, remodel, alter or acquire a facility, or part of a facility, the assurance extends to the entire facility and facilities operated in connection therewith.

- 3) Real Property. Where the sponsor receives a grant or other Federal financial assistance in the form of, or for the acquisition of real property or an interest in real property, the assurance will extend to rights to space on, over, or under such property.

c. Duration.

The sponsor agrees that it is obligated to this assurance for the period during which Federal financial assistance is extended to the program, except where the Federal financial assistance is to provide, or is in the form of, personal property, or real property, or interest therein, or structures or improvements thereon, in which case the assurance obligates the sponsor, or any transferee for the longer of the following periods:

- 1) So long as the airport is used as an airport, or for another purpose involving the provision of similar services or benefits; or
- 2) So long as the sponsor retains ownership or possession of the property.

d. Required Solicitation Language. It will include the following notification in all solicitations for bids, Requests For Proposals for work, or material under this grant agreement and in all proposals for agreements, including airport concessions, regardless of funding source:

“The **(Name of Sponsor)**, in accordance with the provisions of Title VI of the Civil Rights Act of 1964 (78 Stat. 252, 42 U.S.C. §§ 2000d to 2000d-4) and the Regulations, hereby notifies all bidders that it will affirmatively ensure that any contract entered into pursuant to this advertisement, disadvantaged business enterprises and airport concession disadvantaged business enterprises will be afforded full and fair opportunity to submit bids in response to this invitation and will not be discriminated against on the grounds of race, color, or national origin in consideration for an award.”

e. Required Contract Provisions.

- 1) It will insert the non-discrimination contract clauses requiring compliance with the acts and regulations relative to non-discrimination in Federally-assisted programs of the DOT, and incorporating the acts and regulations into the contracts by reference in every contract or agreement subject to the non-discrimination in Federally-assisted programs of the DOT acts and regulations.
- 2) It will include a list of the pertinent non-discrimination authorities in every contract that is subject to the non-discrimination acts and regulations.
- 3) It will insert non-discrimination contract clauses as a covenant running with the land, in any deed from the United States effecting or recording a transfer of real property, structures, use, or improvements thereon or interest therein to a sponsor.
- 4) It will insert non-discrimination contract clauses prohibiting discrimination on the basis of race, color, national origin, creed, sex, age, or handicap as a

covenant running with the land, in any future deeds, leases, license, permits, or similar instruments entered into by the sponsor with other parties:

- a) For the subsequent transfer of real property acquired or improved under the applicable activity, project, or program; and
 - b) For the construction or use of, or access to, space on, over, or under real property acquired or improved under the applicable activity, project, or program.
- f. It will provide for such methods of administration for the program as are found by the Secretary to give reasonable guarantee that it, other recipients, sub-recipients, sub-grantees, contractors, subcontractors, consultants, transferees, successors in interest, and other participants of Federal financial assistance under such program will comply with all requirements imposed or pursuant to the acts, the regulations, and this assurance.
- g. It agrees that the United States has a right to seek judicial enforcement with regard to any matter arising under the acts, the regulations, and this assurance.

31. Disposal of Land.

- a. For land purchased under a grant for airport noise compatibility purposes, including land serving as a noise buffer, it will dispose of the land, when the land is no longer needed for such purposes, at fair market value, at the earliest practicable time. That portion of the proceeds of such disposition which is proportionate to the United States' share of acquisition of such land will be, at the discretion of the Secretary, (1) reinvested in another project at the airport, or (2) transferred to another eligible airport as prescribed by the Secretary. The Secretary shall give preference to the following, in descending order, (1) reinvestment in an approved noise compatibility project, (2) reinvestment in an approved project that is eligible for grant funding under Section 47117(e) of title 49 United States Code, (3) reinvestment in an approved airport development project that is eligible for grant funding under Sections 47114, 47115, or 47117 of title 49 United States Code, (4) transferred to an eligible sponsor of another public airport to be reinvested in an approved noise compatibility project at that airport, and (5) paid to the Secretary for deposit in the Airport and Airway Trust Fund. If land acquired under a grant for noise compatibility purposes is leased at fair market value and consistent with noise buffering purposes, the lease will not be considered a disposal of the land. Revenues derived from such a lease may be used for an approved airport development project that would otherwise be eligible for grant funding or any permitted use of airport revenue.
- b. For land purchased under a grant for airport development purposes (other than noise compatibility), it will, when the land is no longer needed for airport purposes, dispose of such land at fair market value or make available to the Secretary an amount equal to the United States' proportionate share of the fair market value of the land. That portion of the proceeds of such disposition which is proportionate to the United States' share of the cost of acquisition of such land will, (1) upon application to the Secretary, be reinvested or transferred to another

eligible airport as prescribed by the Secretary. The Secretary shall give preference to the following, in descending order: (1) reinvestment in an approved noise compatibility project, (2) reinvestment in an approved project that is eligible for grant funding under Section 47117(e) of title 49 United States Code, (3) reinvestment in an approved airport development project that is eligible for grant funding under Sections 47114, 47115, or 47117 of title 49 United States Code, (4) transferred to an eligible sponsor of another public airport to be reinvested in an approved noise compatibility project at that airport, and (5) paid to the Secretary for deposit in the Airport and Airway Trust Fund.

- c. Land shall be considered to be needed for airport purposes under this assurance if (1) it may be needed for aeronautical purposes (including runway protection zones) or serve as noise buffer land, and (2) the revenue from interim uses of such land contributes to the financial self-sufficiency of the airport. Further, land purchased with a grant received by an airport operator or owner before December 31, 1987, will be considered to be needed for airport purposes if the Secretary or Federal agency making such grant before December 31, 1987, was notified by the operator or owner of the uses of such land, did not object to such use, and the land continues to be used for that purpose, such use having commenced no later than December 15, 1989.
- d. Disposition of such land under (a) (b) or (c) will be subject to the retention or reservation of any interest or right therein necessary to ensure that such land will only be used for purposes which are compatible with noise levels associated with operation of the airport.

32. Engineering and Design Services.

It will award each contract, or sub-contract for program management, construction management, planning studies, feasibility studies, architectural services, preliminary engineering, design, engineering, surveying, mapping or related services with respect to the project in the same manner as a contract for architectural and engineering services is negotiated under Title IX of the Federal Property and Administrative Services Act of 1949 or an equivalent qualifications-based requirement prescribed for or by the sponsor of the airport.

33. Foreign Market Restrictions.

It will not allow funds provided under this grant to be used to fund any project which uses any product or service of a foreign country during the period in which such foreign country is listed by the United States Trade Representative as denying fair and equitable market opportunities for products and suppliers of the United States in procurement and construction.

34. Policies, Standards, and Specifications.

It will carry out the project in accordance with policies, standards, and specifications approved by the Secretary including but not limited to the advisory circulars listed in the Current FAA Advisory Circulars for AIP projects, dated _____ (the latest approved version as of this grant offer) and included in this grant, and in accordance

with applicable state policies, standards, and specifications approved by the Secretary.

35. Relocation and Real Property Acquisition.

- a. It will be guided in acquiring real property, to the greatest extent practicable under State law, by the land acquisition policies in Subpart B of 49 CFR Part 24 and will pay or reimburse property owners for necessary expenses as specified in Subpart B.
- b. It will provide a relocation assistance program offering the services described in Subpart C and fair and reasonable relocation payments and assistance to displaced persons as required in Subpart D and E of 49 CFR Part 24.
- c. It will make available within a reasonable period of time prior to displacement, comparable replacement dwellings to displaced persons in accordance with Subpart E of 49 CFR Part 24.

36. Access By Intercity Buses.

The airport owner or operator will permit, to the maximum extent practicable, intercity buses or other modes of transportation to have access to the airport; however, it has no obligation to fund special facilities for intercity buses or for other modes of transportation.

37. Disadvantaged Business Enterprises.

The sponsor shall not discriminate on the basis of race, color, national origin or sex in the award and performance of any DOT-assisted contract covered by 49 CFR Part 26, or in the award and performance of any concession activity contract covered by 49 CFR Part 23. In addition, the sponsor shall not discriminate on the basis of race, color, national origin or sex in the administration of its DBE and ACDBE programs or the requirements of 49 CFR Parts 23 and 26. The sponsor shall take all necessary and reasonable steps under 49 CFR Parts 23 and 26 to ensure nondiscrimination in the award and administration of DOT-assisted contracts, and/or concession contracts. The sponsor's DBE and ACDBE programs, as required by 49 CFR Parts 26 and 23, and as approved by DOT, are incorporated by reference in this agreement. Implementation of these programs is a legal obligation and failure to carry out its terms shall be treated as a violation of this agreement. Upon notification to the sponsor of its failure to carry out its approved program, the Department may impose sanctions as provided for under Parts 26 and 23 and may, in appropriate cases, refer the matter for enforcement under 18 U.S.C. 1001 and/or the Program Fraud Civil Remedies Act of 1936 (31 U.S.C. 3801).

38. Hangar Construction.

If the airport owner or operator and a person who owns an aircraft agree that a hangar is to be constructed at the airport for the aircraft at the aircraft owner's expense, the airport owner or operator will grant to the aircraft owner for the hangar a long term lease that is subject to such terms and conditions on the hangar as the airport owner or operator may impose.

39. Competitive Access.

- a. If the airport owner or operator of a medium or large hub airport (as defined in section 47102 of title 49, U.S.C.) has been unable to accommodate one or more requests by an air carrier for access to gates or other facilities at that airport in order to allow the air carrier to provide service to the airport or to expand service at the airport, the airport owner or operator shall transmit a report to the Secretary that-
 - 1) Describes the requests;
 - 2) Provides an explanation as to why the requests could not be accommodated; and
 - 3) Provides a time frame within which, if any, the airport will be able to accommodate the requests.
- b. Such report shall be due on either February 1 or August 1 of each year if the airport has been unable to accommodate the request(s) in the six month period prior to the applicable due date.

Appendix E



**BANDON STATE AIRPORT
INGRESS/EGRESS AGREEMENT**

The State of Oregon, acting by and through its Department of Aviation, hereinafter referred to as AVIATION, hereby grants to Bandon Aero Club, Inc., hereinafter referred to as PERMITTEE, right of ingress to and egress from the Bandon State Airport, Coos County, Oregon, on the terms and conditions described in this agreement.

Definitions

"Airport" - The Bandon State Airport.

"Public Use Area" - All portions of the Airport as are available for public use as permitted by AVIATION, as such may change from time to time.

"Adjacent Property" - That certain contiguous parcel of improved real property owned by PERMITTEE and located adjacent to the Airport, as depicted on the attached Exhibit "A".

"Point of Ingress/Egress" - The point where the Airport's taxiway adjoins and abuts the Adjacent Property, as depicted on the attached Exhibit "A".

"Based Aircraft" - Lawfully registered aircraft listing Bandon State Airport on the aircraft registration and required to be registered.

Recitals

- A. AVIATION owns and operates Bandon State Airport for the benefit of the public.
- B. PERMITTEE owns the Adjacent Property from which aircraft access the airport. Ownership of the Adjacent Property is held by Tenants in Common. At the time that the Tenants in Common form a duly registered legal entity to be named as PERMITTEE, this agreement will be amended to change the named PERMITTEE to that entity.
- C. PERMITTEE desires to obtain rights of ingress/egress to the airport for itself and its employees, agents, contractors, unit owners, and invitees; AVIATION is willing to allow such rights of ingress/egress, on the terms set forth in this agreement.

SECTION 1

Grant, Scope, Term, Representatives

1.1 **Grant** AVIATION grants to PERMITTEE non-exclusive rights of ingress and egress at the Point of Ingress/Egress, to and from the public use area of the airport; provided, however, that AVIATION reserves the rights to (i) deny access to anyone at the Point of Ingress/Egress if it determines that the entry poses a risk to the efficient operation of the Airport, and (ii) to relocate the Point of Ingress/Egress upon sixty (60) days' written notice to PERMITTEE, including for the purpose of accommodating third parties or others to whom AVIATION grants ingress/egress

rights. This grant is contingent upon the continued ownership and operation of the Airport by AVIATION, and upon the continued compliance by PERMITTEE with all of the conditions of this agreement.

1.2 **No Rights in Real Property** PERMITTEE acknowledges that the rights granted pursuant to this agreement are personal to the parties herein and do not create any real property rights and shall neither burden the Airport nor benefit the Adjacent Property.

1.3 **Term** This agreement will be in full force and effect for a period of five years, commencing on June 1, 2005 and ending on May 31, 2010.

1.4 **Authorized Representative** Upon signing this agreement, PERMITTEE hereby names as authorized representative to act in each of their behalf to carry out their responsibilities and obligations under the terms of this agreement the signatories identified on the signature page of this agreement. Such representatives may be changed at any time, by written notice as set forth in Section 3.21 of this agreement.

SECTION 2

Payment for and Use of Airport Access

2.1 Consideration

Ingress/Egress Fee

(b) PERMITTEE shall pay to AVIATION the greater of the following amounts:

(A) A fee for each aircraft based on the adjacent property which is the subject of this permit. The per aircraft fee is based on aircraft weight at the rate shown on the attached Exhibit "B". AVIATION, however, reserves its right to review and adjust the consideration payable to AVIATION annually. Payment is due on the 25th of each month for the previous month, i.e., payments for the month of January 2006 will be due on February 25, 2006; or

(B) \$275.

Payment shall be accompanied by a detailed report listing each based aircraft showing aircraft class, N-number, aircraft type, and the hangar or tiedown number where the aircraft is stored. A report summarizing this information by class shall also be provided.

2.2 Penalties

(A) For any charges or fees due to ODA, a Tenant shall pay a penalty for late or delinquent payments of no less than 10 percent per month on any past due balance calculated from the date the amount is due until the close of the business day upon which the delinquent payment is received by ODA.

(B) In the event that any check to AVIATION for payment under this lease is returned to AVIATION by PERMITTEE'S bank unpaid for any cause, PERMITTEE shall pay AVIATION a fifty dollar (\$50.00) fee in addition to the amount of the check and any administrative charge due under the above paragraph.

2.3 Possession and Use PERMITTEE is granted the non-exclusive right to use, in a lawful manner and in common with others, all of the Public Use Area, as such may change from time to time, including but not limited to, landing, taxiing, parking areas and other common use facilities.

2.4 Posting Point of Ingress/Egress PERMITTEE shall post and control all of the Point of Ingress/Egress to prevent use by persons not allowed under this agreement. Signs shall be placed on PERMITTEE'S property. Such signs shall be placed as not to interfere with or be an obstruction to taxiing aircraft. AVIATION shall have the right to require PERMITTEE to add signs or replace or remove signs which AVIATION determines to be inadequate, improper or a safety hazard.

2.5 Prohibited Uses of Airport PERMITTEE shall not use or permit to be used any portion of the Airport or other state-owned property for storage of non-aviation related personal property except in areas allowed and designated by AVIATION. PERMITTEE understands that if state-

owned airport property is used for such storage, AVIATION may demand and compel its removal upon forty-eight (48) hour notice. If such personal property is not removed within the specified time after such demand, then AVIATION may remove the same and charge the cost of the removal to PERMITTEE. PERMITTEE agrees that its use of the Airport, and that of its employees, agents, unit owners, and contractors shall be confined to the Public Use Area and the Point of Ingress/Egress shall allow use only by aircraft meeting the Airport's design criteria. No automobiles, bicycles, trucks, motorcycles or other power driven vehicles, pedestrians, or animals, shall be allowed on the Airport Public Use Area or the Point of Ingress/Egress except for vehicles authorized by AVIATION.

Any dangerous articles or magnetized materials being transported by or under the control of PERMITTEE over AVIATION' property shall be done in strict accordance with Title 49 of the Code of Federal regulations (49 CFR). AVIATION reserves the right at any time to prohibit said transporting of any or all dangerous articles or magnetized materials as defined in 49 CFR, a copy of which is available upon request at AVIATION' office.

2.6 **Assignment** This agreement shall not be assigned; however, AVIATION acknowledges that PERMITTEE is a group of Tenants in Common, each owning improvements and a portion of the entire property. Furthermore, each Tenant in Common has exclusive use of a hangar unit, and pays a portion of the access fee paid by PERMITTEE. Additionally, each Tenant in Common shall be permitted to transfer their interest, subject to bylaws of the Tenants in Common Agreement. AVIATION shall be notified in writing at the completion of each transfer of the name, address and aircraft N-number of each transferee.

2.7 **No Exclusive Right** Nothing herein contained shall be construed to grant or authorize the granting of an exclusive right forbidden by Section 308 of the Federal Aviation Act of 1958.

SECTION 3
Duty to Comply

3.1 **Records** PERMITTEE shall keep proper books of account and other records pertaining to its operation. The books and records shall be available at all times during normal business hours to AVIATION and its authorized representatives including the Oregon Secretary of State's Office and the federal government, which may inspect all such books and records to ascertain compliance with the terms and conditions of this agreement.

3.2 **AVIATION Entry onto Premises** Subject to advance notice unless an emergency exists, representatives of AVIATION may enter the ingress/egress area at any time for the purpose of determining compliance with the terms and conditions of this agreement.

3.3 **Airport Regulations** PERMITTEE'S exercise of its rights under this agreement is subject to all existing and future regulations adopted by the State Aviation Board relative to the operation of the Bandon State Airport, and PERMITTEE agrees to comply with all of the provisions of such regulations. The flights conducted at this airport shall conform to all applicable Federal Aviation Regulations, Oregon AVIATION Laws, and traffic patterns as established at the Airport.

3.4 **Construction or Alteration** PERMITTEE agrees that no structure, building or other facility which violates the airport imaginary surfaces as defined in Federal Aviation Regulations (FAR), Part 77, shall be constructed or permitted to be constructed on the Adjacent Property. PERMITTEE further agrees that notice of any and all proposed construction or alteration shall be submitted through AVIATION to the Federal Aviation Administration (FAA) on FAA Form 7460-1 "Notice of Proposed Construction or Alteration" as prescribed in FAR Part 77.17. AVIATION shall retain the right to require its prior written approval of any construction on the Adjacent Property by PERMITTEE. AVIATION shall not unreasonably withhold its approval.

3.5 **Protection of the Airport's Imaginary Surfaces** AVIATION shall have the right to take any action it considers necessary to protect the Airport's imaginary surfaces, as defined by FAR, Part 77, against obstructions, together with the right to prevent PERMITTEE from erecting, or permitting to be erected, any building or other structure on the airport which, in the opinion of AVIATION, would limit the usefulness of the Airport or constitute a hazard to aircraft.

3.6 **Access and Automobile Parking** No motor vehicle belonging to PERMITTEE and its unit owners, except aircraft shall be allowed on the airport runway, taxiway, or adjacent airport land, except in areas specifically designated for motor vehicle use.

3.7 **Maintenance** PERMITTEE shall maintain the Point of Ingress/Egress, as shown on Exhibit "A", in a safe condition at all times. PERMITTEE shall maintain the adjacent property in a reasonably clean and neat fashion, and shall not permit the accumulation of rubbish, junk, aircraft or automobile parts or any other material.

3.8 **Hazardous Substances** For purposes of this agreement, the following are collectively included as Hazardous Substances: environmentally hazardous or toxic materials, substances, compounds, mixtures, wastes, oils or any other substances defined as a pollutant or contaminant by any federal, state or local law, rule or regulations. PERMITTEE represents, warrants and covenants that it has not and shall not nor shall it allow anyone else, either willfully or negligently to store, dispose of, or release any Hazardous Substance on any portion of the Airport property. PERMITTEE shall indemnify and hold AVIATION harmless from any and all claims, losses, damage, cleanup costs, attorney fees and other expenses resulting from the presence of any Hazardous Substances in, on, upon or under the Point of Ingress/Egress or any portion of the adjacent property or the airport if such damage to the airport results from PERMITTEE'S actions or failure to act. All costs associated with the use of Hazardous Substances or petroleum products, including but not limited to costs of cleanup, removal, remediation, and compliance with federal, state and local environmental requirements, shall be the primary responsibility of PERMITTEE. All Hazardous Substances and petroleum products shall be used, handled, cleaned up, removed and remediated in accordance with federal, state and local requirements.

3.9 **Recycle Requirements** PERMITTEE shall store and recycle petroleum products and dispose of Hazardous Substances in accordance with the Oregon Department of Environmental Quality's rules and regulations, as such may change, and which are available by contacting the Oregon Department of Environmental Quality.

3.10 **Compliance with Law** PERMITTEE shall observe and obey all laws, ordinances, rules and regulations promulgated by any lawful authority of the United States, the State of Oregon, or any municipal subdivision having authority over or jurisdiction of the premises, including, but not limited to safety, health, sanitary, fire, electrical and building codes, zoning and state and local comprehensive plans and criminal laws, relating to its use of the Airport and Adjacent Property under this Agreement.

3.11 **Organized Public Activities** In the event that any organized public activity using the airport's airspace or aircraft operational areas is planned by PERMITTEE at the Bandon State Airport, PERMITTEE shall request approval from AVIATION in writing not less than thirty (30) days prior to any scheduled activity. PERMITTEE shall submit to AVIATION an application containing the pertinent facts relative to this activity, and based on the information presented, AVIATION will, at its sole discretion with due regard to airport operational benefit, issue an approval or denial of said activity. After notice is received by AVIATION, conditional obligations of the PERMITTEE shall be determined and transmitted to PERMITTEE by AVIATION if AVIATION determines that the nature of the scheduled activity requires changed or added

obligations for safe conduct of the activity. Should AVIATION grant approval of the planned activity, PERMITTEE'S obligations shall include, but shall not be limited to the following:

3.11.1 execute a "Hold Harmless and Indemnity Agreement" holding the State of Oregon, Department of Aviation, free and harmless from any accident, incident or, violation of the Federal Aviation Regulations or Oregon State Laws, in connection with the scheduled activity;

3.11.2 make available a Unicom radio and a fully qualified operator thereof, advising aircraft traffic that the scheduled activity is in progress;

3.11.3 remove all debris and litter resulting from the scheduled activity within twenty-four (24) hours of the activity's completion. The airport shall be returned to the same condition as it was prior to the scheduled activity;

AVIATION requests that upon becoming aware of any fly-in, air show, or organized public activity contemplated or planned by others, PERMITTEE notify AVIATION immediately.

3.12 **Insurance** Prior to execution of this agreement, PERMITTEE shall buy, at his own expense, and keep in effect during the term of this lease, as a minimum, general liability insurance for personal injury, property damage and contractual liability insurance covering all of PERMITTEE'S activities under this agreement. Coverage limits shall not be less than \$100,000 per person for personal injury, \$100,000 for property damage and \$500,000 total for all claims arising out of a single accident or occurrence. When said policy contains an aggregate limit, PERMITTEE shall provide an additional \$1,000,000 excess insurance coverage.

The PERMITTEE shall include the State of Oregon, by and through its Department of Aviation, its officers, agents and employees, and the State Aviation Board as named insured on insurance policies issued to meet this provision, or shall furnish additional insured endorsement naming the same as additional insured to PERMITTEE 'S existing public liability and property damage insurance.

The above described insurance shall be provided by an insurance company authorized to do business in the State of Oregon and the policy shall contain a cross-liability clause in behalf of the State of Oregon, shall be in a form satisfactory to AVIATION and shall cover any and all losses due to maintenance, operations, use of the airport, or activities conducted or sponsored by the PERMITTEE, its sublessees, employees, agents or any contractors.

These limits of insurance shall be primary and exclusive of any carried by the State of Oregon and shall be exhausted first.

Upon executing the contract, PERMITTEE shall furnish to AVIATION for approval a Certificate of Insurance as evidence of the insurance coverages and limits required by this contract. Insurance coverages shall not be amended, altered, modified or canceled without at least thirty (30) days notice to AVIATION, and this shall be so stated in the Certificate of Insurance.

The parties agree that in the event the insurance limitations required herein are determined by legislation, court action or otherwise to be inadequate, the insurance requirements shall be adjusted within thirty days to comply with the new requirements.

Failure to keep required insurance in effect or failure to provide proof, upon request by AVIATION, of continuance of such insurance is grounds for default and termination pursuant to the provisions of Section IV, paragraphs 4.1 and 4.3.

3.13 **Responsible Party** PERMITTEE is responsible for any damage caused by its employees, agents, contractors, and unit owners, and PERMITTEE shall indemnify AVIATION from and against any and all costs, damage or liability actions resulting from the conduct of any of PERMITTEE'S unit owners, their invitees, lessees and assigns.

3.14 **No Waiver** The covenants of this agreement are continuing covenants, and the waiver, whether express or implied by AVIATION or PERMITTEE, of breaches of these covenants shall not be deemed a waiver of subsequent breaches thereof.

3.15 **Amendment** Any future agreement between the parties of this agreement hereinafter made shall be ineffective to modify or discharge this agreement, in whole or in part, unless such agreement is in writing and executed with the same formalities as this instrument.

3.16 **Subordination to Federal-State Agreements** The provisions of this agreement shall be subordinate to any existing or future agreement between AVIATION and the United States relative to the operation or maintenance of the Bandon State Airport, the execution of which has been or may be required as a condition precedent to the receipt of federal funds for the development of the airport. Failure of PERMITTEE to comply with any of the requirements of any existing or future agreement between AVIATION and the United States shall be cause for immediate termination of PERMITTEE'S rights hereunder. During a time of war or national emergency, AVIATION shall have the right to lease the landing area or any part thereof to the United States government for military or other federal government purposes, and, if such lease is executed, the provisions of this agreement, insofar as they are inconsistent with the provisions of the lease to the government, shall be suspended and reinstated at such time as the lease with the federal government is terminated. Suspended time shall be considered as part of the term of this lease and will not extend the expiration date of this agreement. The ingress/egress fee to be paid by PERMITTEE to AVIATION shall be waived during such time as any lease with the federal government is in effect.

3.17 **AVIATION' Right to Develop the Airport** AVIATION reserves its right to further alter, develop or improve the Airport in accordance with its duty to develop aviation within the State of Oregon as dictated by the demands of air traffic and aviation safety.

3.18 **Maintenance of Airport** AVIATION shall maintain the runways, public taxiways, and aircraft parking area. It is mutually understood that AVIATION retains sole authority to determine the methods and schedules by which any maintenance or necessary construction is to be performed. AVIATION shall have the right to close the airport whenever it deems it necessary for reasons of public safety or convenience. No advance notice shall be necessary when closure of the airport is by reason of weather, acts of God, or other unforeseen circumstances.

3.19 **Standard Notices** For any terms of this agreement which require notice, written notice sent certified mail with postage affixed and mailed to the address provided in the signature portion of this agreement shall be deemed sufficient. Notice shall be deemed received the third day after the mailing date. Either party may, by notice in writing to the other, change the address to which notices to that party are to be given.

3.20 **Authority** Any and all powers and authority conferred upon PERMITTEE by this agreement shall be strictly construed, and no other powers may be lawfully exercised by PERMITTEE without AVIATION' prior written consent. PERMITTEE shall not have any authority to act on behalf of AVIATION, or to bind AVIATION to any third party, contractually or otherwise, except as is expressly stated herein.

3.21 **No Agency** The parties hereto understand and agree that the requirements imposed on PERMITTEE by terms of this agreement shall not be construed to make PERMITTEE an officer, employee or agent of the State of Oregon, Department of Aviation, as those terms are used in ORS 30.265.

SECTION 4

Termination and Default

4.1 **Events of Default** Any one or more of the following events shall constitute a default under this agreement and entitle AVIATION to pursue the remedies set forth in this Section IV.

4.1.1. PERMITTEE fails to make payment when due of any ingress/egress fee when and as due, and such failure continues for more than ten (10) days.

4.1.2. PERMITTEE fails to comply with any of the covenants, agreements, terms or conditions contained in this agreement, and such failure continues for more than thirty (30) days after written notice is given to PERMITTEE by AVIATION, in the manner set forth in Section 3.19.

4.1.3. PERMITTEE files a voluntary petition of bankruptcy, or has filed against it an involuntary petition of bankruptcy or makes any assignment of its property for the benefit of creditors;

4.1.4. PERMITTEE abandons use of the Adjacent Property for more than fifteen (15) days; or

4.1.5. PERMITTEE fails to comply with all applicable federal and Oregon laws, and/or local permits, licenses or ordinances, including but not limited to the Oregon Uniform Trade Practices Act (ORS 646.605 to 646.652).

4.2 **Remedies** Upon the occurrence of any one or more Events of Default, and after giving PERMITTEE written notice as provided in 3.19, AVIATION may exercise any one or more of the following remedies, or any other remedy available under applicable law or in equity;

4.2.1 remove or occupy any property of either PERMITTEE or PERMITTEE'S unit owners located on any portion of the Airport;

4.2.2 deny PERMITTEE or PERMITTEE'S unit owners any of their rights under the terms of this agreement, including the rights of ingress and egress to and from the Point of Ingress/Egress;

4.2.3 recover all unpaid fees due under this agreement, and damages caused by the default including attorney fees, including an administrative fee equal to 10% of such past due fees or amounts; or

4.2.4 terminate this agreement, by written notice mailed to PERMITTEE at the addresses set forth in the signatures section of this agreement, and pursue all additional remedies available at law or in equity.

4.3 **Termination; Survival** Upon termination of this agreement, PERMITTEE shall immediately cease use of the access point between the Adjacent Property and the Airport. Unless

otherwise specified in this agreement, all fees, charges or liabilities owing or arising under this agreement shall survive termination of this agreement. This agreement shall terminate upon:

4.3.1 Mailing of AVIATION' termination notice, for any of the conditions and upon the procedure set forth in Section 4.2.4;

4.3.2 Mutual written agreement of AVIATION and PERMITTEE;

4.3.3 Sale of all or any portions of PERMITTEE'S interests in the Adjacent Property except as described in paragraph 2.6 and as otherwise provided herein.

4.3.4 Sixty (60) days' written notice to PERMITTEE from AVIATION that the State Aviation Board has determined to (i) close or sell the Airport, or (ii) require relocation of the Point of Ingress/Egress, or (iii) develop the airport; provided, however, that in the event of relocation of the Point of Ingress/Egress for good cause, AVIATION shall make a determination regarding relocating the Point of Ingress/Egress in a manner which would afford PERMITTEE access to the Public Use Area from the Adjacent Property. If AVIATION offers a substitute Point of Ingress/Egress not agreeable to PERMITTEE, PERMITTEE shall have ten (10) days to either accept or reject such offer in writing and, if it accepts, this agreement shall remain in full force and effect and PERMITTEE'S obligation to pay any fee under this agreement shall be waived for the amount of time PERMITTEE is required to suspend operation as a result of such relocation. Access at such relocated area shall be made available at the rate which is in effect in this agreement on the date relocation is completed, and shall remain in effect for the balance of that calendar year. If PERMITTEE rejects the offer, or fails to respond to the offer within ten (10) days, this agreement shall terminate without recourse against AVIATION.

4.4 **Declaration of Termination; and No Warranty of Non-interference by Entities Outside AVIATION' Control** The parties hereto understand and recognize that the actions of local governmental units, parties holding land or living adjacent to the Bandon State Airport, and governmental entities not subject to AVIATION' influence and control, may have, in the future, adverse impacts upon the number and character of flight and other operations at the airport. In such event, PERMITTEE has the option of declaring this agreement terminated on ninety (90) days' written notice to AVIATION and the provisions of SECTION 4.3, Termination, shall apply. PERMITTEE agrees to not seek to recover any damages from AVIATION.

4.5 **Non-Exclusive Rights and Remedies** The rights and remedies provided in the above provisions relating to default, including breach of contract, shall not be exclusive, and are in addition to any rights and remedies provided by law or in equity or otherwise under this agreement.

4.6 **Holding Over** Any holding over after the expiration of the term of this agreement, shall be allowed only with payment of rent at a monthly rate to be determined by AVIATION, but not

substantially exceeding the amount of the ingress/egress fee set forth in Section 2.1. Holding over creates a month-to-month tenancy subject to the terms and conditions of this agreement at the sufferance of AVIATION and is subject to termination on thirty (30) days' written notice by either of AVIATION or PERMITTEE.

IN WITNESS WHEREOF the parties hereto have affixed their signatures the day and year written below.

The State Aviation Board, by duly-adopted Delegation Order No. 1, dated October 12, 2000, has authorized the Director of the Department of Aviation to act in its behalf in approving and executing this agreement.

STATE OF OREGON by and through its Department of AVIATION

BY: Charles Riordan
Charles Riordan, State Airport Manager

DATE 12-1-05

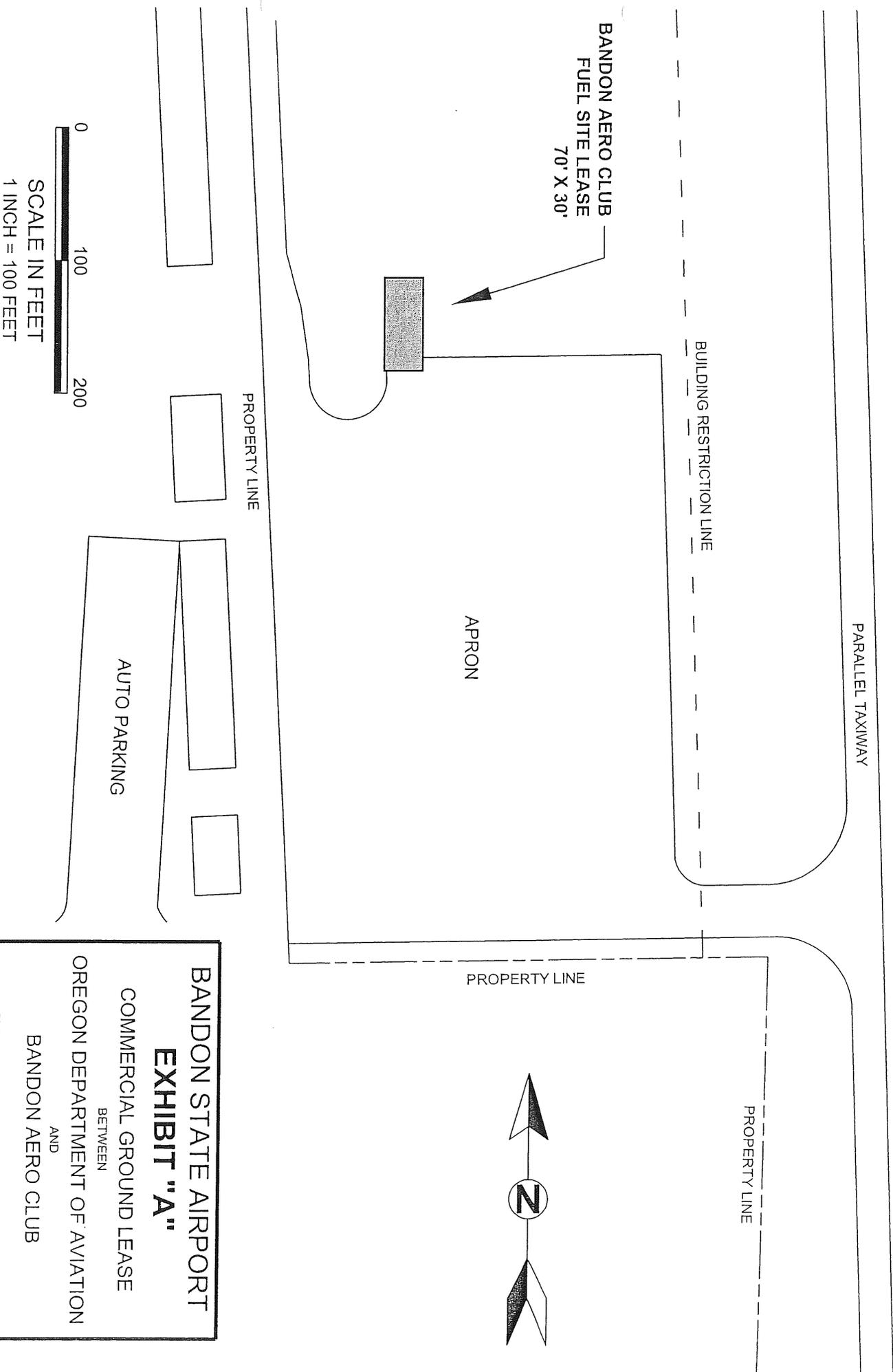
PERMITTEE: Bandon Aero Club

BY: Robert L. Thrush
~~Dave Cameron~~ Robert L. Thrush
BAC President

DATE 11-21-05

Mailing Address: P.O. Box 1007 Bandon, OR 97411

Telephone (Res) 541-347-5078 (bus) _____



0 100 200
 SCALE IN FEET
 1 INCH = 100 FEET



BANDON STATE AIRPORT
EXHIBIT "A"
 COMMERCIAL GROUND LEASE
 BETWEEN
 OREGON DEPARTMENT OF AVIATION
 AND
 BANDON AERO CLUB
 DWN. BY: M.R. DECEMBER 4, 2000

EXHIBIT B
PER AIRCRAFT WEIGHT BASED FEE

<u>Aircraft Weight Class</u>	<u>Weight Range</u>	<u>Monthly Fee Per Aircraft</u>
Class 1	Up to 5,000 lbs.	\$15.00
Class 2	5,001-10,000 lbs.	\$24.00
Class 3	10,001-20,000 lbs.	\$44.00
Class 4	20,001-30,000 lbs.	\$66.00
Class 5	30,001-40,000 lbs.	\$88.00
Class 6	40,001 lbs. and over	\$120.00

Glossary of Terms



GLOSSARY OF AVIATION TERMS

The following glossary of aviation terms was compiled from a variety of aviation industry sources.

Above Ground Level (AGL) – As measured above the ground; used to identify heights of built items (towers, etc.) on aeronautical charts in terms of absolute height above the ground.

Accelerate Stop Distance Available (ASDA) – The length of the takeoff run available plus the length of a stopway, when available.

Agricultural Aviation – The use of fixed-wing or rotor-wing aircraft in the aerial application of agricultural products (i.e., fertilizers, pesticides, etc.).

Air Cargo - All commercial air express and air freight with the exception of airmail and parcel post.

Air Carrier/Airline - All regularly scheduled airline activity performed by airlines certificated in accordance with Federal Aviation Regulations (FAR Part 121).

Air Taxi - Operations of aircraft "for hire" for specific trips, commonly referred to as aircraft available for charter (FAR Part 135).

Aircraft Approach Category - Grouping of aircraft based on the speed they are traveling when configured for landing (typically 1.3 times the aircraft stall speed in landing configuration). As a rule of thumb, slower approach speeds mean smaller airport dimensions and faster approach speeds require larger dimensions. The aircraft approach categories are:

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

Aircraft Holding Area – An area typically located adjacent to a taxiway and runway end designed to accommodate aircraft prior to departure (for pre-takeoff engine checks, instrument flight plan clearances, etc.). Per FAA design standards, aircraft holding areas should be located outside the runway safety area (RSA) and obstacle free zone (OFZ) and aircraft located in the holding area should not interfere with normal taxiway use (taxiway object free area). Sometimes referred to as holding bays or "elephant ear." Smaller areas (aircraft turnarounds) are used to facilitate aircraft movement on runways

without exit taxiways or where back-taxiing is required.

Aircraft Operation - A landing or takeoff is one operation. An aircraft that takes off and then lands creates two aircraft operations.

Aircraft Owners and Pilots Association (AOPA) – A general aviation organization.

Aircraft Parking Line (APL) – A setback depicted on an ALP or other drawings that defines the minimum separation between aircraft parking areas and an adjacent runway or taxiway. The APL dimension reflects runway and taxiway clearances (object free area, etc.) and FAR Part 77 airspace surface clearance (transitional surface penetrations) for parked aircraft. Typically the tail height of the parked aircraft is used to determine adequate clearance for the transitional surface.

Airplane Design Group - A grouping of airplanes based on wingspan and tail height. As with Approach Category, the wider the wingspan, the bigger the aircraft is, the more room it takes up for operating on an airport. The Airplane Design Groups are:

- Group I: Up to but not including 49 feet or tail height up to but not including 20 feet.
- Group II: 49 feet up to but not including 79 feet or tail height from 20 up to but not including 30 feet.
- Group III: 79 feet up to but not including 118 feet or tail height from 30 up to but not including 45 feet.
- Group IV: 118 feet up to but not including 171 feet or tail height from 45 up to but not including 60 feet.
- Group V: 171 feet up to but not including 214 feet or tail height from 60 up to but not including 66 feet.
- Group VI: 214 feet up to but not including 262 feet or tail height from 66 up to but not including 80 feet.

Airport - A landing area regularly used by aircraft for receiving or discharging passengers or cargo, including heliports and seaplane bases.

Airport Beacon (also Rotating Beacon) – A visual navigational aid that displays alternating green and white flashes for a lighted land airport and white for an unlighted land airport.

GLOSSARY OF AVIATION TERMS

Airports District Office (ADO) - The "local" office of the FAA that coordinates planning and construction projects. The Seattle ADO is responsible for airports located in Washington, Oregon, and Idaho.

Airport Improvement Program (AIP) - The funding program administered by the Federal Aviation Administration (FAA) with user fees which are dedicated to improvement of the national airport system. This program currently provides 95% of funding for eligible airport improvement projects. The local sponsor of the project (i.e., airport owner) provides the remaining 5% known as the "match."

Airport Layout Plan (ALP) - The FAA approved drawing which shows the existing and anticipated layout of an airport for the next 20 years. An ALP is prepared using FAA design standards. Future development projects must be consistent with the ALP to be eligible for FAA funding. ALP drawings are typically updated every 7 to 10 years to reflect significant changes, or as needed.

Airport Reference Code (ARC) - An FAA airport coding system that is defined based on the critical or design aircraft for an airport or individual runway. The ARC is an alpha-numeric code based on aircraft approach speed and airplane wingspan (see definitions in glossary). The ARC is used to determine the appropriate design standards for runways, taxiways, and other associated facilities. An airport designed to accommodate a Piper Cub (an A-I aircraft) requires less room than an airport designed to accommodate a Boeing 747 (a D-V aircraft).

Airport Reference Point (ARP) - The approximate mid-point of an airfield that is designated as the official airport location.

Aircraft Rescue and Fire Fighting (ARFF) - On airport emergency response required for certificated commercial service airports (see FAR Part 139).

Airside - The portion of an airport that includes aircraft movement areas (runways, taxiways, etc.).

Airspace - The area above the ground in which aircraft travel. It is divided into enroute and terminal airspace, with corridors, routes, and restricted zones established for the control and safety of air traffic.

Alternate Airport - An airport that is available for landing when the intended airport becomes unavailable. Required for instrument flight planning in the event that weather conditions at destination airport fall below approach minimums (cloud ceiling or visibility).

Annual Service Volume (ASV) - An estimate of how many aircraft operations an airport can handle based upon the number, type and configuration of runways, aircraft mix (large vs. small, etc.), instrumentation, and weather conditions with a "reasonable" amount of delay. ASV is a primary planning standard used to determine when a runway (or an airport) is nearing its capacity, and may require new runways or taxiways. As operations levels approach ASV, the amount of delay per operation increases; once ASV is exceeded, "excessive" delay generally exists.

Approach End of Runway - The end of the runway used for landing. Pilots generally land into the wind and choose a runway end that best aligns with the wind.

Approach Light System (ALS) - Configurations of lights positioned symmetrically beyond the runway threshold and the extended runway centerline. The ALS visually augments the electronic navigational aids for the runway.

Approach Reference Code (APRC) - The APRC is composed of three components: AAC, ADG, and visibility minimums. Visibility minimums are expressed as Runway Visual Range (RVR) values in feet of 1600, 2400, 4000, and 5000 (nominally corresponding to lower than 1/2 mile, lower than 3/4 mile but not lower than 1/2 mile, not lower than 3/4 mile, and not lower than one mile, respectively).

Approach Surface (Also FAR Part 77 Approach) - An imaginary (invisible) surface that rises and extends from the ends of a runway to provide an unobstructed path for aircraft to land or take off. The size and slope of the approach surface vary depending upon the size of aircraft that are accommodated and the approach capabilities (visual or instrument).

Apron - An area on an airport designated for the parking, loading, fueling, or servicing of aircraft (also referred to as tarmac and ramp).

Aqueous Film Forming Foam (AFFF) - A primary fire-fighting agent that is used to create a blanket that smothers flame or prevents ignition (fuel spills, etc.). AFFF is also used to foam runways during emergency landings.

Asphalt or Asphaltic Concrete (AC) - Flexible oil-based pavement used for airfield facilities (runways, taxiways, aircraft parking apron, etc.); also commonly used for road construction.

GLOSSARY OF AVIATION TERMS

Automated Surface Observation System (ASOS) and Automated Weather Observation System (AWOS) – Automated observation systems providing continuous on-site weather data, designed to support aviation activities and weather forecasting.

AVGAS – Highly refined gasoline used in airplanes with piston engines. The current grade of AVGAS available is 100 Octane Low Lead (100LL).

Avigation Easement - A grant of property interest (airspace) over land to ensure unobstructed flight. Typically acquired by airport owners to protect the integrity of runway approaches. Restrictions typically include maximum height limitations for natural (trees, etc.) or built items, but may also address permitted land uses by the owner of the underlying land that are compatible with airport operations.

Back-Taxiing – The practice of aircraft taxiing on a runway before takeoff or after landing, normally, in the opposite direction of the runway's traffic pattern. Back-taxiing is generally required on runways without taxiway access to both runway ends.

Based Aircraft - Aircraft permanently stationed at an airport usually through some form of agreement with the airport owner. Used as a measure of activity at an airport.

Capacity - A measure of the maximum number of aircraft operations that can be accommodated on the runways of an airport in an hour.

Ceiling – The height above the ground or water to base of the lowest cloud layers covering more than 50 percent of the sky.

Charter - Operations of aircraft "for hire" for specific trips, commonly referred to an aircraft available for charter.

Circle to Land or Circling Approach – An instrument approach procedure that allows pilots to "circle" the airfield to land on any authorized runway once visual contact with the runway environment is established and maintained throughout the procedure.

Commercial Service Airport - An airport designed and constructed to serve scheduled or unscheduled commercial airlines. Commercial service airports are certified under FAR Part 139.

Common Traffic Advisory Frequency (CTAF) – A frequency used by pilots to communicate and obtain airport advisories at an uncontrolled airport.

Complimentary Fire Extinguishing Agent – Fire extinguishing agents that provide rapid fire suppression, which may be used in conjunction with principal agents (e.g., foam). Examples include sodium-based and potassium-based dry chemicals, Halocarbons, and Carbon dioxide. Also recommended for electrical and metal fires where water-based foams are not used. Complimentary agents are paired with principal agents based on their compatibility of use.

Conical Surface - One of the "FAR Part 77 "Imaginary" Surfaces. The conical surface extends outward and upward from the edge of the horizontal surface at a slope of 20:1 to a horizontal distance of 4,000 feet.

Controlling Obstruction – The highest obstruction relative to a defined plane of airspace (i.e., approach surface, etc.).

Critical Aircraft - Aircraft which controls one or more design items based on wingspan, approach speed and/or maximum certificated take-off weight. The same aircraft may not be critical to all design items (i.e., runway length, pavement strength, etc.). Also referred to as "design aircraft."

Crosswind - Wind direction that is not parallel to the runway or the path of an aircraft.

Crosswind Runway – An additional runway (secondary, tertiary, etc.) that provides wind coverage not adequately provided by the primary runway. Crosswind runways are generally eligible for FAA funding when a primary runway accommodates less than 95 percent of documented wind conditions (see wind rose).

Decision Height (DH) – For precision instrument approaches, the height (typically in feet or meters above runway end touchdown zone elevation) at which a decision to land or execute a missed approach must be made by the pilot.

Declared Distances – The distances the airport owner declares available for airplane operations (e.g., takeoff run, takeoff distance, accelerate-stop distance, and landing distance). In cases where runways meet all FAA design criteria without modification, declared distances equal the total runway length. In cases where any declared distances are less than full runway length, the dimension should be published in the FAA Airport/Facility Directory (A/FD).

Departure Reference Code (DPRC) – The DPRC represents aircraft that can take off from a runway while any aircraft are present on adjacent taxiways, under particular meteorological conditions with no special operational procedures necessary.

GLOSSARY OF AVIATION TERMS

Departure Surface – A surface that extends upward from the departure end of an instrument runway that should be free of any obstacle penetrations. For instrument runways other than air carrier, the slope is 40:1, extending 10,200 feet from the runway end. Air carrier runways have a similar surface designed for one-engine inoperative conditions with a slope of 62.5: 1.

Design Aircraft - Aircraft which controls one or more design items based on wingspan, approach speed and/or maximum certificated takeoff weight. The same aircraft may not represent the design aircraft for all design items (i.e., runway length, pavement strength, etc.). Also referred to as "critical aircraft."

Displaced Threshold – A landing threshold located at a point other than on the runway end, usually provided to mitigate close-in obstructions to runway approaches for landing aircraft. The area between the runway end and the displaced threshold accommodates aircraft taxi and takeoff, but not landing.

Distance Measuring Equipment (DME) – Equipment that provides electronic distance information to enroute or approaching aircraft from a land-based transponder that sends and receives pulses of fixed duration and separation. The ground stations are typically co-located with VORs, but they can also be co-located with an ILS.

Distance Remaining Signs – Airfield signs that indicate to pilots the amount of useable runway remaining in 1,000-foot increments. The signs are located along the side of the runway, visible for each direction of runway operation.

DNL - Day-night sound levels, a mathematical method of measuring noise exposure based on cumulative, rather than single event impacts. Night time operations (10pm to 7AM) are assessed a noise penalty to reflect the increased noise sensitivity that exists during normal hours of rest. Previously referred to as Ldn.

Easement – An agreement that provides use or access of land or airspace (see aviation easement) in exchange for compensation.

Enplanements - Domestic, territorial, and international revenue passengers who board an aircraft in the states in scheduled and non-scheduled service of aircraft in intrastate, interstate, and foreign commerce and includes in-transit passengers (passengers on board international flights that transit an airport in the US for non-traffic purposes).

Entitlements - Distribution of Airport Improvement Plan (AIP) funds by FAA from the Airport & Airways Trust Fund to commercial service airport sponsors based on passenger enplanements or cargo volumes and smaller fixed amounts for general aviation airports (Non-Primary Entitlements).

Experimental Aircraft – See homebuilt aircraft.

Federal Aviation Administration (FAA) - The FAA is the branch of the U.S. Department of Transportation that is responsible for the development of airports and air navigation systems.

FAR Part 77 - Federal Air Regulations (FAR) which establish standards for determining obstructions in navigable airspace and defines imaginary (airspace) surfaces for airports and heliports that are designed to prevent hazards to air navigation. FAR Part 77 surfaces include approach, primary, transitional, horizontal, and conical surfaces. The dimensions of surfaces can vary with the runway classification (large or small airplanes) and approach type of each runway end (visual, non-precision instrument, precision instrument). The slope of an approach surface also varies by approach type and runway classification. FAR Part 77 also applies to helicopter landing areas.

FAR Part 139 - Federal Aviation Regulations which establish standards for airports with scheduled passenger commercial air service. Airports accommodating scheduled passenger service with aircraft more than 9 passenger seats must be certified as a "Part 139" airport. Airports that are not certified under Part 139 may accommodate scheduled commercial passenger service with aircraft having 9 passenger seats or less.

Final Approach Fix (FAF) – The fix (location) from which the final instrument approach to an airport is executed; also identifies beginning of final approach segment.

Final Approach Point (FAP) – For non-precision instrument approaches, the point at which an aircraft is established inbound for the approach and where the final descent may begin.

Fixed Base Operator (FBO) - An individual or company located at an airport providing aviation services. Sometimes further defined as a "full service" FBO or a limited service. Full service FBOs typically provide a broad range of services (flight instruction, aircraft rental, charter, fueling, repair, etc.) where a limited service FBO provides only one or two services (such as fueling, flight instruction or repair).

Fixed Wing - A plane with one or more "fixed wings," as opposed to a helicopter that utilizes a rotary wing.

GLOSSARY OF AVIATION TERMS

Flexible Pavement – Typically constructed with an asphalt surface course and one or more layers of base and subbase courses that rest on a subgrade layer.

Flight Service Station (FSS) – FAA or contracted service for pilots to contact (on the ground or in the air) to get weather and airport information. Flight plans are also filed with the FSS.

General Aviation (GA) - All civil (non-military) aviation operations other than scheduled air services and non-scheduled air transport operations for hire.

Glide Slope (GS) – For precision instrument approaches, such as an instrument landing system (ILS), the component that provides electronic vertical guidance to aircraft.

Global Positioning System (GPS) - GPS is a system of navigating which uses multiple satellites to establish the location and altitude of an aircraft with a high degree of accuracy. GPS supports both enroute flight and instrument approach procedures.

Helicopter Landing Pad (Helipad) – A designated landing area for rotor wing aircraft. Requires protected FAR Part 77 imaginary surfaces, as defined for heliports (FAR Part 77.29).

Helicopter Parking Area – A designated area for rotor wing aircraft parking that is typically accessed via hover-taxi or ground taxiing from a designated landing area (e.g., helipad or runway-taxiway system). If not used as a designated landing area, helicopter parking pads do not require dedicated FAR Part 77 imaginary surfaces.

Heliport – A designated helicopter landing facility (as defined by FAR Part 77).

Height Above Airport (HAA) – The height of the published minimum descent altitude (MDA) above the published airport elevation. This is normally published in conjunction with circling minimums.

High Intensity Runway Lights (HIRL) - High intensity (i.e., very bright) lights are used on instrument runways to help pilots to see the runway when visibility is poor.

High Speed (Taxiway) Exit – An acute-angled exit taxiway extending from a runway to an adjacent parallel taxiway which allows landing aircraft to exit the runway at a higher rate of speed than is possible with standard (90-degree) exit taxiways.

Hold Line (Aircraft Hold Line) – Pavement markings located on taxiways that connect to runways, indicating where aircraft should stop before entering runway environment. At controlled

airports, air traffic control clearance is required to proceed beyond a hold line. At uncontrolled airports, pilots are responsible for ensuring that a runway is clear prior to accessing for takeoff.

Hold/Holding Procedure – A defined maneuver in controlled airspace that allows aircraft to circle above a fixed point (often over a navigational aid or GPS waypoint) and altitude while awaiting further clearance from air traffic control.

Home Built Aircraft - An aircraft built by an amateur from a kit or specific design (not an FAA certified factory built aircraft). The aircraft built under the supervision of an FAA-licensed mechanic and are certified by FAA as “Experimental.”

Horizontal Surface - One of the FAR Part 77 Imaginary (invisible) Surfaces. The horizontal surface is an imaginary flat surface 150 feet above the established airport elevation (typically the highest point on the airfield). Its perimeter is constructed by swinging arcs (circles) from each runway end and connecting the arcs with straight lines. The oval-shaped horizontal surface connects to other Part 77 surfaces extending upward from the runway and also beyond its perimeter.

Initial Approach Point/Fix (IAP/IAF) – For instrument approaches, a designated point where an aircraft may begin the approach procedure.

Instrument Approach Procedure (IAP) – A series of defined maneuvers designed to enable the safe transition between enroute instrument flight and landing under instrument flight conditions at a particular airport or heliport. IAPs define specific requirements for aircraft altitude, course, and missed approach procedures. See precision or non-precision instrument approach.

Instrument Flight Rules (IFR) - IFR refers to the set of rules pilots must follow when they are flying in bad weather. Pilots are required to follow these rules when operating in controlled airspace with visibility (ability to see in front of themselves) of less than three miles and/or ceiling (a layer of clouds) lower than 1,000 feet.

Instrument Landing System (ILS) - An ILS is an electronic navigational aid system that guides aircraft for a landing in bad weather. Classified as a precision instrument approach, it is designed to provide a precise approach path for course alignment and vertical descent of aircraft. Generally consists of a localizer, glide slope, outer marker, and middle marker. ILS runways are generally equipped with an approach lighting system (ALS) to maximize approach capabilities. A Category I ILS allows aircraft to descend as low as 200 feet above runway elevation with ½ mile visibility.

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Instrument Meteorological Conditions (IMC) - Meteorological conditions expressed in terms of visibility, distance from clouds, and ceiling less than minima specified for visual meteorological conditions.

Instrument Runway - A runway equipped with electronic navigational aids that accommodate straight-in precision or non-precision instrument approaches.

Itinerant Operation - All aircraft operations at an airport other than local, i.e., flights that come in from another airport.

Jet Fuel – Highly refined grade of kerosene used by turbine engine aircraft. Jet-A is currently the common commercial grade of jet fuel.

Knot (Nautical Mile) – one nautical mile = 1.152 statute miles.

Landing Area - That part of the movement area intended for the landing and takeoff of aircraft.

Landing Distance Available (LDA) – The length of runway which is available and suitable for the ground run of an airplane landing.

Landside – The portion of an airport that includes aircraft parking areas, fueling, hangars, airport terminal area facilities, vehicle parking and other associated facilities.

Larger than Utility Runway – As defined under FAR Part 77, a runway designed and constructed to serve large planes (aircraft with maximum takeoff weights greater than 12,500 pounds).

Ldn – Noise measurement metric (see DNL).

Left Traffic – A term used to describe which side of a runway the airport traffic pattern is located. Left traffic indicates that the runway will be to the pilot's left when in the traffic pattern. Left traffic is standard unless otherwise noted in facility directories at a particular airport.

Large Aircraft - An aircraft with a maximum takeoff weight more than 12,500 lbs.

Light Sport Aircraft (LSA) – A basic aircraft certified by FAA that can be flown by pilots with limited flight training (Sport Pilot certificates), but also provide lower cost access to basic aircraft for all pilot levels. LSA design limits include maximum a gross takeoff weight of 1,320 pounds (land planes) and a maximum of two seats.

Local Area Augmentation System (LAAS) – GPS-based instrument approach that utilizes ground-based systems to augment satellite coverage to provide vertical (glideslope) and horizontal (course) guidance.

Local Operation - Aircraft operation in the traffic pattern or within sight of the tower, or aircraft known to be departing or arriving from flight in local practice areas, or aircraft executing practice instrument approaches at the airport.

Localizer – The component of an instrument landing system (ILS) that provides electronic lateral (course) guidance to aircraft. Also used to support non-precision localizer approaches.

LORAN C - A navigation system using land based radio signals, which indicates position and ground speed, but not elevation. (See GPS)

Localizer Performance with Vertical Guidance (LPV) – Satellite navigation (SATNAV) based GPS approaches providing “near category I” precision approach capabilities with course and vertical guidance. LPV approaches are expected to eventually replace traditional step-down, VOR and NDB procedures by providing a constant, ILS glideslope-like descent path. LPV approaches use high-accuracy WAAS signals, which allow narrower glideslope and approach centerline obstacle clearance areas.

Magnetic Declination – Also called magnetic variation, is the angle between magnetic north and true north. Declination is considered positive east of true north and negative when west. Magnetic declination changes over time and with location. Runway end numbers, which reflect the magnetic heading/alignment (within 5 degrees +/-) occasionally require change due to declination.

MALS - **Medium-intensity Approach Lighting System with Runway alignment indicator lights.** An approach lighting system (ALS) which provides visual guidance to landing aircraft.

Medevac - Fixed wing or rotor-wing aircraft used to transport critical medical patients. These aircraft are equipped to provide life support during transport.

Medium Intensity Runway Lights (MIRL) - Runway edge lights which are not as intense as HIRLs (high intensity runway lights). Typical at medium and smaller airports which do not have sophisticated instrument landing systems.

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Microwave Landing System (MLS) - An instrument landing system operating in the microwave spectrum, which provides lateral and vertical guidance to aircraft with compatible equipment. Originally developed as the "next-generation" replacement for the ILS, the FAA discontinued the MLS program in favor of GPS-based systems.

Minimum Descent Altitude (MDA) – The lowest altitude in a non-precision instrument approach that an aircraft may descend without establishing visual contact with the runway or airport environment.

Minimums - Weather condition requirements established for a particular operation or type of operation.

Missed Approach Procedure – A prescribed maneuver conducted by a pilot when an instrument approach cannot be completed to a landing. Usually requires aircraft to climb from the airport environment to a specific holding location where another approach can be executed or the aircraft can divert to another airport.

Missed Approach Point (MAP) – The defined location in a non-precision instrument approach where the procedure must be terminated if the pilot has not visually established the runway or airport environment.

Movement Area - The runways, taxiways and other areas of the airport used for taxiing, takeoff and landing of aircraft, i.e., for aircraft movement.

MSL - Elevation above Mean Sea Level.

National Plan of Integrated Airport Systems (NPIAS). The NPIAS is the federal airport classification system that includes public use airports that meet specific eligibility and activity criteria. A "NPIAS designation" is required for an airport to be eligible to receive FAA funding for airport projects.

Navigational Aid (Navaid) - Any visual or electronic device that helps a pilot navigate. Can be for use to land at an airport or for traveling from point A to point B.

Noise Contours – Continuous lines of equal noise level usually drawn around a noise source, such as runway, highway or railway. The lines are generally plotted in 5-decibel increments, with higher noise levels located nearer the noise source, and lesser exposure levels extending away from the source.

Non-directional Beacon (NDB) - Non-Directional Beacon which transmits a signal on which a pilot may "home" using equipment installed in the aircraft.

Non-Precision Instrument (NPI) Approach - A non-precision instrument approach provides horizontal (course) guidance to pilots for landing. NPI approaches often involve a series of "step down" sequences where aircraft descend in increments (based on terrain clearance), rather than following a continuous glide path. The pilot is responsible for maintaining altitude control between approach segments since no "vertical" guidance is provided.

Obstacle Clearance Surface (OCS) – As defined by FAA, an approach surface that is used in conjunction with alternative threshold siting/clearing criteria to mitigate obstructions within runway approach surfaces. Dimensions, slope and placement depend on runway type and approach capabilities. Also known as Obstacle Clearance Approach (OCA).

Obstruction - An object (tree, house, road, phone pole, etc.) that penetrates an imaginary surface described in FAR Part 77.

Obstruction Chart (OC) - A chart that depicts surveyed obstructions that penetrate an FAR Part 77 imaginary surface surrounding an airport. OC charts are developed by the National Ocean Service (NOS) based on a comprehensive survey that provides detailed location (latitude/longitude coordinates) and elevation data in addition to critical airfield data.

Parallel Taxiway – A taxiway that is aligned parallel to a runway, with connecting taxiways to allow efficient movement of aircraft between the runway and taxiway. The parallel taxiway effectively separates taxiing aircraft from arriving and departing aircraft located on the runway. Used to increase runway capacity and improve safety.

Passenger Facility Charge (PFC) – A user fee charged by commercial service airports for enplaning passengers. Airports must apply to the FAA and meet certain requirements in order to impose a PFC.

Pavement Condition Index (PCI) – A scale of 0-100 that is used to rate airfield pavements ranging from failed to excellent based on visual inspection. Future PCIs can be predicted based on pavement type, age, condition and use as part of a pavement maintenance program.

Pavement Strength or Weight Bearing Capacity – The design limits of airfield pavement expressed in maximum aircraft weight for specific and landing gear configurations (i.e., single wheel, dual wheel, etc.) Small general aviation airport pavements are typically designed to accommodate aircraft weighing up to 12,500 pounds with a single-wheel landing gear.

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Portland Cement Concrete (PCC) – Rigid pavement used for airfield facilities (runways, taxiways, aircraft parking, helipads, etc.).

Precision Approach Path Indicator (PAPI) - A system of lights located by the approach end of a runway that provides visual approach slope guidance to aircraft during approach to landing. The lights typically show green if a pilot is on the correct flight path, and turn red if a pilot is too low.

Precision Instrument Runway (PIR) - A runway equipped with a "precision" instrument approach (descent and course guidance), which allows aircraft to land in bad weather.

Precision Instrument Approach – An instrument approach that provides electronic lateral (course) and vertical (descent) guidance to a runway end. A non-precision instrument approach typically provides only course guidance and the pilot is responsible for managing defined altitude assignments at designated points within the approach.

Primary Runway - That runway which provides the best wind coverage, etc., and receives the most usage at the airport.

Primary Surface - One of the FAR Part 77 Imaginary Surfaces, the primary surface is centered on top of the runway and extends 200 feet beyond each end. The width is from 250' to 1,000' wide depending upon the type of airplanes using the runway.

Principal Fire Extinguishing Agent – Fire extinguishing agents that provide permanent control of fire through a fire-smothering foam blanket. Examples include protein foam, aqueous film forming foam and fluoroprotein foam.

Procedure Turn (PT) - A maneuver in which a turn is made away from a designated track followed by a turn in an opposite direction to permit an aircraft to intercept the track in the opposite direction (usually inbound).

Area Navigation (RNAV) - is a method of instrument flight navigation that allows an aircraft to choose a course within a network of navigation beacons rather than navigating directly to and from the beacons. Originally developed in the 1960, RNAV elements are now being integrated into GPS-based navigation.

Relocated Threshold – A runway threshold (takeoff and landing point) that is located at a point other than the (original) runway end. Usually provided to mitigate nonstandard runway safety area (RSA) dimensions beyond a runway end. When a runway threshold is relocated, the published length of the runway is reduced and the pavement between the relocated threshold and to the original end of the

runway is not available for aircraft takeoff or landing. This pavement is typically marked as taxiway, marked as unusable, or is removed.

Required Navigation Performance (RNP) – A type of performance-based navigation system that allows an aircraft to fly a specific path between two 3-dimensionally defined points in space. RNP approaches require on-board performance monitoring and alerting. RNP also refers to the level of performance required for a specific procedure or a specific block of airspace. For example, an RNP of .3 means the aircraft navigation system must be able to calculate its position to within a circle with a radius of 3 tenths of a nautical mile. RNP approaches have been designed with RNP values down to .1, which allow aircraft to follow precise 3 dimensional curved flight paths through congested airspace, around noise sensitive areas, or through difficult terrain.

Rigid Pavement – Typically constructed of Portland cement concrete (PCC), consisting of a slab placed on a prepared layer of imported materials.

Rotorcraft - A helicopter.

Runway – A defined area intended to accommodate aircraft takeoff and landing. Runways may be paved (asphalt or concrete) or unpaved (gravel, turf, dirt, etc.), depending on use. Water runways are defined takeoff and landing areas for use by seaplanes.

Runway Bearing – The angle of a runway centerline expressed in degrees (east or west) relative to true north.

Runway Design Code (RDC) – The RDC is comprised of the AAC, ADG, and approach visibility minimums of a particular runway. The RDC provides the information needed to determine applicable design standards. The AAC is based on aircraft approach speed. The ADG is based on either the aircraft wingspan or tail height; (whichever is most restrictive) of the largest aircraft expected to operate on the runway and taxiways adjacent to the runway. The approach visibility minimums represent RVR values in feet of 1,200, 1,600, 2,400, 4,000, and 5,000 (corresponding to lower than 1/4 mile, lower than 1/2 mile but not lower than 1/4 mile, lower than 3/4 mile but not lower than 1/2 mile, lower than 1 mile but not lower than 3/4 mile, and not lower than 1 mile, respectively).

Runway Designation Numbers – Numbers painted on the ends of a runway indicating runway orientation (in degrees) relative to magnetic north. "20" = 200 degrees magnetic, which means that the final approach for Runway 20 is approximately 200 degrees (+/- 5 degrees).

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Runway End Identifier Lights (REILs) - Two high-intensity sequenced strobe lights that help pilots identify a runway end during landing in darkness or poor visibility.

Runway Object Free Area (OFA) – A defined area surrounding a runway that should be free of any obstructions that could interfere with aircraft operations. The dimensions for the OFA increase for runways accommodating larger or faster aircraft.

Runway Protection Zone (RPZ) – A trapezoid-shaped area located beyond the end of a runway that is intended to be clear of people or built items. The geometry of the RPZ often coincides with the inner portion of the runway approach surface. However, unlike the approach surface, the RPZ is a defined area on the ground that does not have a vertical slope component for obstruction clearance. The size of the RPZ increases as runway approach capabilities or aircraft approach speeds increase. Previously defined as “clear zone.”

Runway Safety Area (RSA) – A symmetrical ground area extending along the sides and beyond the ends of a runway that is intended to accommodate inadvertent aircraft passage without causing damage. The dimensions for the RSA increase for runways accommodating larger or faster aircraft. FAA standards include surface condition (compaction, etc.) and absence of obstructions. Any items that must be located within an RSA because of their function (runway lights, airfield signage, wind cones, etc.) must be frangible (breakable) to avoid significant aircraft damage.

Segmented Circle - A system of visual indicators designed to show a pilot in the air the direction of the traffic pattern at that airport.

Small Aircraft - An aircraft that weighs 12,500 lbs. or less.

Straight-In Approach – An instrument approach that directs aircraft to a specific runway end.

Statute Mile – 5,280 feet (a nautical mile = 6,080 feet).

Stop and Go – An aircraft operation where the aircraft lands and comes to a full stop on the runway before takeoff is initiated.

T-Hangar – A rectangular aircraft storage hangar with several interlocking "T" units that minimize building per storage unit. Usually two-sided with either bi-fold or sliding doors.

Takeoff Distance Available (TODA) – the length of the takeoff run available plus the length of clearway, if available.

Takeoff Run Available (TORA) – the length of runway available and suitable for the ground run of aircraft when taking off.

Taxilane – A defined path used by aircraft to move within aircraft parking apron, hangar areas and other landside facilities.

Taxiway – A defined path used by aircraft to move from one point to another on an airport.

Threshold – The beginning of that portion of a runway that is useable for landing.

Taxiway Design Group (TDG) – The TDG is based on the undercarriage dimensions of the aircraft. TDG is used to determine taxiway/taxilane width and fillet standards, and in some instances, runway to taxiway and taxiway/taxilane separation requirements.

Threshold Lights – Components of runway edge lighting system located at the ends of runways and at displaced thresholds. Threshold lights typically have split lenses (green/red) that identify the beginning and ends of usable runway.

Through-the-Fence – Term used to describe how off-airport aviation users (private airparks, hangars, etc.) access an airport “through-the-fence,” rather than having facilities located on airport property.

Tiedown - A place where an aircraft is parked and "tied down." Surface can be grass, gravel or paved. Tiedown anchors may be permanently installed or temporary.

Touch and Go – An aircraft operation involving a landing followed by a takeoff without the aircraft coming to a full stop or exiting the runway.

Traffic Pattern - The flow of traffic that is prescribed for aircraft landing and taking off from an airport. Traffic patterns are typically rectangular in shape, with upwind, crosswind, base and downwind legs and a final approach surrounding a runway.

Traffic Pattern Altitude - The established altitude for a runway traffic pattern, typically 800 to 1,000 feet above ground level (AGL).

Transitional Surfaces - One of the FAR Part 77 Imaginary Surfaces, the transitional surface extend outward and upward at right angles to the runway centerline and the extended runway centerline at a slope of 7:1 from the sides of the primary surface and from the sides of the approach surfaces.

Universal Communications (UNICOM) is an air-ground communication facility operated by a private agency to provide advisory service at uncontrolled airports.

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Utility Runway – As defined under FAR Part 77, a runway designed and constructed to serve small planes (aircraft with maximum takeoff weights of 12,500 pounds or less).

Vertical Navigation (VNAV) – Vertical navigation descent data or descent path, typically associated with published GPS instrument approaches. The use of any VNAV approach technique requires operator approval, certified VNAV-capable avionics, and flight crew training.

VOR - Very High Frequency Omnidirectional Range – A ground based electronic navigational aid that transmits radials in all directions in the VHF frequency spectrum. The VOR provides azimuth guidance to aircraft by reception of radio signals.

VORTAC – VOR collocated with ultra-high frequency tactical air navigation (TACAN).

Visual Approach Slope Indicator (VASI) - A system of lights located by the approach end of a runway which provides visual approach slope guidance to aircraft during approach to landing. The lights typically show some combination of green and white if a pilot is on the correct flight path, and turn red if a pilot is too low.

Visual Flight Rules (VFR) - Rules that govern the procedures to conducting flight under visual conditions. The term is also used in the US to indicate weather conditions that are equal to or greater than minimum VFR requirements. In addition, it is used by pilots and controllers to indicate type of flight plan.

Visual Guidance Indicator (VGI) – Equipment designed to provide visual guidance for pilots for landing through the use of different color light beams. Visual Approach Slope Indicators (VASI) and Precision Approach Path Indicators (PAPI) defined above are examples.

Waypoint – A specified geographical location used to define an area navigation route or the flight path of an aircraft employing area navigation.

Wide Area Augmentation System (WAAS) – GPS-based instrument approach that can provide both vertical (glideslope) and horizontal (course) guidance. WAAS-GPS approaches are able to provide approach minimums nearly comparable to a Category I Instrument Landing System (ILS).

Wind Rose - A diagram that depicts observed wind data direction and speed on a 360-degree compass rose. Existing or planned proposed runway alignments are overlain to determine wind coverage levels based on the crosswind limits of the design aircraft.

Wind Cone – A device located near landing areas used by pilots to verify wind direction and velocity. Usually manufactured with brightly colored fabric and may be lighted for nighttime visibility. Also referred to as “wind sock.”

LIST OF ABBREVIATIONS

AC – Advisory Circular	MALS – Medium Intensity Approach Lighting System (MALS) with Runway Alignment Indicator Lights (RAIL)
AC – Asphaltic Concrete	MIRL – Medium Intensity Runway Lighting
ACM – Airport Certification Manual	MITL – Medium Intensity Taxiway Lighting
ADG – Airplane Design Group	MTOW – Maximum Takeoff Weight
ADO – Airport District Office	NAVAID – Navigation Aid
AGL – Above Ground Level	NDB – Non-Directional Beacon
AIP – Airport Improvement Program	NEPA – National Environmental Policy Act
ALP – Airport Layout Plan	NGS – National Geodetic Survey
ALS – Approach Lighting System	NPIAS – National Plan of Integrated Airport Systems
AOA – Airport Operations Area	OCS – Obstacle Clearance Surface
APL – Aircraft Parking Line	ODALS – Omnidirectional Airport Lighting System
APRC – Approach Reference Code	OFA – Object Free Area
ARC – Airport Reference Code	OFZ – Obstacle Free Zone
ARFF – Aircraft Rescue and Fire Fighting	PAPI – Precision Approach Path Indicator
ARP – Airport Reference Point	PCC – Portland Cement Concrete
ASDA – Accelerate-Stop Distance Available	PCI – Pavement Condition Index
ASV – Annual Service Volume	PCN – Pavement Condition Number
ATC – Air Traffic Control	POFZ – Precision Obstacle Free Zone
ATCT – Airport Traffic Control Tower	RAIL – Runway Alignment Indicator Lights
ASOS – Automated Surface Observation System	RDC – Runway Design Code
AWOS – Automated Weather Observation System	REIL – Runway End Identifier Lights
BRL – Building Restriction Line	RNAV – Area Navigation
CFR – Code of Federal Regulations	ROFA – Runway Object Free Area
CTAF – Common Traffic Advisory Frequency	ROFZ – Runway Obstacle Free Zone
DPRC – Departure Reference Code	RPZ – Runway Protection Zone
DME – Distance Measuring Equipment	RSA – Runway Safety Area
FAA – Federal Aviation Administration	RVR – Runway Visual Range
FAR – Federal Air Regulation	RVZ – Runway Visibility Zone
FBO – Fixed Base Operator	TDG – Taxiway Design Group
GIS – Geographic Information System	TSA – Taxiway Safety Area
GS – Glide Slope	TSA – Transportation Security Administration
GPS – Global Positioning System	TODA – Takeoff Distance Available
HIRL – High Intensity Runway Lighting	TOFA – Taxiway/Taxilane Object Free Area
IFR – Instrument Flight Rules	TORA – Takeoff Run Available
ILS – Instrument Landing System	TSS – Threshold Siting Surface
IMC – Instrument Meteorological Conditions	TVOR – Terminal Very High Frequency Omnidirectional Range
LDA – Landing Distance Available	UAS – Unmanned Aircraft Systems
LDA – Localizer Directional Aid	UGA – Urban Growth Area
LIRL – Low Intensity Runway Lighting	UGB – Urban Growth Boundary
LOC – Localizer	

LIST OF ABBREVIATIONS

UHF – Ultra-High Frequency
USDA – United States Department of Agriculture
USGS – U. S. Geological Survey
UNICOM – Universal Communications
VASI – Visual Approach Slope Indicator
VFR – Visual Flight Rules
VGI - Visual Guidance Indicators
VOR – Very High Frequency Omni-Directional Range



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