Tillamook

AIRPORT

Port of Tillamook Bay

Airport Layout Plan Narrative Report

AIRPORT LAYOUT PLAN
NARRATIVE REPORT

for

TILLAMOOK AIRPORT
Tillamook, Oregon

FINAL REPORT

Prepared for

The Port of Tillamook Bay

by

Precision Approach Engineering, Inc.
and
Coffman Associates, Inc.

Final Printing
August 2012

"The preparation of this document was financially supported, in part, through the Airport Improvement Program as administered by 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 or would have justification in accordance with appropriate public laws."

TABLE OF CONTENTS

CONTENTS

TILLAMOOK AIRPORT
Tillamook, Oregon

AIRPORT LAYOUT PLAN
NARRATIVE REPORT

(Continued)

(Continued)

EXHIBITS

AIRPORT LAYOUT PLAN
NARRATIVE REPORT

AIRPORT LAYOUT PLAN NARRATIVE REPORT

The purpose of the Airport Layout Plan (ALP) narrative report is to provide the Port of Tillamook Bay, the Oregon Department of Aviation, and the Federal Aviation Administration (FAA) with a clear vision of necessary airport improvements over the next 20 years. The report will also include an updated ALP drawing set, which is a drawing of the airport that shows the current and future conditions. Included with this set are new approach and departure surface drawings, as well as a layout of imaginary surfaces as defined by FAA standards.

INTRODUCTION

In early 2010, the Port of Tillamook Bay provided direction to the airport's consulting engineer, Precision Approach Engineering, to begin the process of preparing a grant application and scope of services for an *Airport Layout Plan Update and Narrative Report* for Tillamook Airport. Following development of a scope of services, budget, and schedule, the Port of Tillamook Bay subsequently received a grant from the FAA to conduct the study.

The study was designed to provide guidance for future development and provide updated justification for projects for which the airport may receive funding participation through federal and state airport improvement programs. Coffman Associates, an airport consulting firm which specializes in master planning and environmental studies, worked with Precision Approach Engineering to develop the plan.

The *Airport Layout Plan Update and Narrative Report* was prepared in accordance with FAA requirements, including Advisory Circular (AC) 150/5300-13, *Airport Design* (as amended), and AC 150/5070-6B, *Airport Master Plans* (2005). The scope of services, budget, and schedule were approved by the Port of Tillamook Bay following review by the FAA. A Notice To Proceed was issued to the consultants on September 1, 2010. The following paragraphs outline the study background, objectives, study elements, and process.

BACKGROUND

The Port of Tillamook Bay is the owner/operator of Tillamook Airport. Located in Tillamook County, Oregon, on the Pacific coast, the airport serves as a regional general aviation facility in the Oregon state system of airports. Originally constructed by the U.S. Navy and used as a blimp base during World War II, the airport provides support to 44 private aircraft, scheduled air cargo flights, and several commercial operators. Limited services and facilities available include: hangar storage, tie-downs, and fueling.

An Industrial Park comprises 785 acres of the Port's 1,600-acre property ownership and lies adjacent to the 537-acre airport site. Highways 6 and 26 provide access to Portland (and points beyond), while U.S. Highway 101/Oregon Coast Highway provides access to points north and south. The Port also owns and operates 95 miles of the Southern Pacific branch line, which connects Tillamook with the Portland area.

The current runway system consists of Runway 13-31, a 5,001-foot by 100-foot asphalt runway with medium intensity edge lighting, and Runway 1-19, a 2,910-foot by 75-foot asphalt runway with medium intensity edge lighting. Over the past few years, several improvements have been made at the facility, including:

- Pavement rehabilitation and new marking.
- New perimeter fencing.
- New automated weather equipment.
- Updated fuel facilities.
- Relocated airport beacon.

OBJECTIVES

The overall objective of the *Airport Layout Plan Update and Narrative Report* was to provide the Port with guidance for future development of the airport, meeting the needs of existing and future users, while also being compatible with the environment. The most recent planning efforts for the airport were undertaken in 1990 for the last *Airport Master Plan* (with a 1993 update) and the more recent *Airport Layout Plan and Property Map* revisions. The new planning study provides justification for new priorities. The plan was closely coordinated with other planning studies in the area, and with aviation plans developed by the FAA and the State of Oregon. Specific objectives of the study included:

- Research factors likely to affect air transportation demand in the Tillamook area over the next 20 years and develop new operational and basing forecasts. The new forecasts were reviewed and approved by the FAA.

- Determine projected needs of airport users, taking into consideration recent changes to FAA design standards and transitions in the type of aircraft flown by corporate and general aviation users.

- Recommend improvements which enhance Tillamook Airport's ability to satisfy future aviation needs and meet FAA safety and design standards.

- Establish a schedule of development priorities and analyze potential funding sources consistent with FAA planning.

- Prepare new airport layout plan drawings using new aerial photography and mapping prepared for this study. Supplemental drawings include: landside facilities, airspace, inner approach surfaces to runways, departure surfaces, property ownership, and on-airport land use (aviation vs. non-aviation related land uses).

PROCESS

To achieve the objectives described above, the *Airport Layout Plan Update and Narrative Report* was prepared in a systematic fashion pursuant to the scope of services that was coordinated with the Port and the FAA. The study included several elements:

- **Study Initiation** - Development of the scope of services, budget, and schedule. A kickoff meeting with an advisory committee was held at the study's initiation in September 2010 to obtain a more comprehensive understanding of local issues.

- **Inventory** - Inventory of facility and operational data, wind data, population and economic data, and development of new aerial photography and mapping.

- **Forecasts** - Forecasts for based aircraft, operations, cargo activity, and peaking characteristics over a 20-year period were developed. The forecasts were forwarded to the FAA for review and approved on January 3, 2011. (Letter attached in Appendix C).

- **Facility Requirements** - After establishing critical aircraft and physical planning criteria, facility needs assessments were developed for airside and landside facilities.

- **Airport Development Alternatives** - Potential airside and landside alternatives were developed for meeting long-term needs.

- **Airport Layout Plan Drawings** - Airport layout plans were developed to depict existing and proposed facilities. The drawings were developed to meet the requirements of the FAA Northwest Mountain Region.

- **Airport Development Schedules and Cost Estimates** - Development schedules and cost estimates were prepared for the development program, and potential federal and state aid for specific projects were identified.

- **Final Drawings and Reports** - Final report documentation includes technical reports (printed and digital formats), and full size/full color copies of report exhibits and drawings produced for the study.

The draft final report documents and drawings were completed in May 2011. Coordination meetings with a local advisory committee were held following completion of the forecasts and facility needs assessments, and again following development of a long-range concept. The local advisory committee consists of Port of Tillamook Bay representation, Tillamook County planning, and local tenants. Final FAA approval of the airport layout plan drawings was received in August 2012.

AIRPORT SYSTEM PLANNING ROLE

Airport planning exists on many levels: national, state, and local. Each level has a different emphasis and purpose. On the national level, Tillamook Airport is included in the *National Plan of Integrated Airport Systems* (NPIAS). On the state level, the airport is included in the *2007 Oregon Aviation Plan*. The local planning document is the Airport Layout Plan (with supporting documentation).

NATIONAL AIRPORT PLANNING

On the national level, Tillamook Airport is included in the NPIAS. This national plan identifies 3,380 public-use airports (3,332 existing and 48 proposed) that are significant to the national air transportation system. The NPIAS is published and used by the FAA in administering the Airport Improvement Program (AIP), which is the source of federal funds for airport improvement projects across the country. The AIP program is funded exclusively by user fees and user taxes, such as those on fuel and airline tickets. The 2011-2015 NPIAS, which was completed in September 2010, estimates $52.2 billion is needed for airport development across the country over the next five years. This is an increase of five percent ($2.5 billion) over the last report issued two years ago. An airport must be included in the NPIAS to be eligible for federal funding assistance through the AIP. Tillamook Airport is classified as a general aviation airport within the NPIAS.

The NPIAS supports the FAA's strategic goals for safety, system efficiency, and environmental compatibility by identifying specific airport improvements. The current issue of the NPIAS identifies approximately $6.9 million in development needs over the next five years for Tillamook Airport. This figure is not a guarantee of federal funding; instead, this figure represents development needs as presented to the FAA in the annual airport capital improvement program.

Airports that apply for and accept AIP grants must provide grant assurances. These assurances include maintaining the airport facility safely and efficiently in accordance with specific conditions. The duration of the assurances depends on the type of airport, the useful life of the facility being developed, and other factors. Typically, the useful life for an airport development project is a minimum of 20 years. Therefore, when an airport accepts AIP grants, they are obligated to maintain that facility in accordance with FAA standards for at least that long.

STATE AIRPORT PLANNING

Tillamook Airport is included in the *2007 Oregon Aviation Plan* (OAP). The OAP is a comprehensive evaluation of Oregon's aviation system and serves as a guide for future aviation and development. The OAP defines the specific role of each airport in the state's aviation system and establishes funding and development needs. The OAP is periodically updated, with the previous version having been completed in 2000. Tillamook Airport is one of 97 public-use airports within the state's aviation system plan. The airport is identified as a regional general aviation airport, which supports most twin and single engine aircraft, may accommodate occasional business jets, and supports regional transportation needs. The applicable design and performance criteria are listed in **Table A**.

TABLE A
Design Criteria for Regional General Aviation Airports

	Minimum Criteria	Desired Criteria
Airside Facilities		
FAA-ARC	B-II	Varies
Runway Length	4,000	Varies
Runway Width	75	Varies
Pavement Type	Concrete or Asphalt	Concrete or Asphalt
Taxiways	Partial or Turnarounds	Full Parallel
Approach Type	Non-Precision	Precision
Visual Aids	One Runway End	Both Runway Ends
Runway Lighting	MIRL	MIRL/HIRL
Taxiway Lighting	MITL	MITL/HITL
General Facilities		
Rotating Beacon	Yes	Yes
Lighted Wind Indicator	Yes	Yes
Weather Reporting	AWOS/ASOS	AWOS/ASOS
Hangared Aircraft Storage	75% of Based Aircraft	100% of Based Aircraft
Apron Parking/Storage	30% of Daily Transient	50% of Daily Transient
Terminal Building	Small Meeting Area	Yes
Auto Parking	Minimal	Moderate
Fencing	Terminal Area	Perimeter
Cargo	Space on Existing Apron	Designated Apron Area
Services		
Fuel	AvGas and Jet A	AvGas, Jet A, 24-hour
FBO	Full Service	Full Service, 24-hour
Ground Transportation	Courtesy Car	Rental, Taxi, or Other
Food Service	Vending	Vending
Restrooms	Yes	Yes
Pilot Lounge	Yes w/ Weather Reporting Station	Yes w/ Weather Reporting Station
Snow Removal	Yes	Yes
Telephone	Yes	Yes

Source: 2007 Oregon System Plan.

LOCAL AIRPORT PLANNING

The ALP and narrative report is the primary local planning document. The report is intended to provide a 20-year vision for airport development, based on aviation demand forecasts. Forecasts beyond five years become less reliable. It has been more than five years since the airport has prepared aviation demand forecasts; therefore, this is an appropriate time to update these forecasts and revisit the development assumptions from the previous plan.

ECONOMIC IMPACT

The airports in Oregon provide the state with a safe and efficient air transportation system and provide an important stimulus for economic development. Many of the state's businesses, large and small, rely on the aviation system to rapidly transport personnel, equipment, and supplies. In addition, the tourism industry in Oregon relies heavily on aviation to support activities such as lodging, dining, retail, and entertainment.

As part of the *2007 Oregon System Plan*, the economic contributions of airports and the aviation industry to the state was analyzed. The economic impacts of airports include direct on-airport impacts, off-airport visitors spending, and spin-off impacts (economic multipliers). The study also quantified economic impacts that were generated by the presence of the airport but may not be aviation-related, such as industrial or business parks. The economic impact is measured in terms of employment, wages, and business sales.

According to the *2007 Oregon System Plan*, the aviation industry in Oregon accounted for 197,040 jobs, \$6.8 billion in wages, and \$24.4 billion in business sales in 2005. This figure includes the Port of Portland airports, which account for approximately 30 percent of the state aviation impact. This study also indicates Tillamook Airport contributed 1,353 jobs, \$4.03 million in wages, and \$157.7 million in business sales in 2005.

AIRPORT HISTORY AND ADMINISTRATION

Tillamook Airport is a public use airport that was developed from the former Tillamook Naval Air Station. Commissioned in 1942, it served as a U.S. Naval Air Station during World War II, and was primarily used to base blimps.

The two hangars (Hangars A&B) built at Tillamook were among the largest buildings in the world framed of timber. They housed eight "K" series blimps, which carried a crew of 8-10 and were used for extended flight operations in the coastal patrols. The techniques for air-sea rescue were developed at Tillamook Naval Air Station, and squadrons of FM-2s used it as a refueling and rearming facility.

The naval station was decommissioned in 1948 and came under the jurisdiction of the new Tillamook County Airport Commission. In 1953, the Port of Ocean Bay acquired the former naval air station and began operating it as the Port of Tillamook Bay, which now owns and operates Tillamook Airport. Hangar A was destroyed by fire in 1992. Hangar B, which is listed on the U.S. National Register of Historical Places, was established as the Tillamook Air Museum in 1994.

PORT OF TILLAMOOK BAY

The airport is owned by the Port of Tillamook Bay and offers limited services to itinerant aircraft through an office adjacent to the ramp. The airport is served by one supervisor and one assistant, who have overlapping schedules in order to provide daily coverage. The Oregon Department of Aviation takes responsibility for runway maintenance funding through an intergovernmental agreement with the Port. Periodic maintenance is also performed by Port staff, and they also maintain the automated weather observation station, runway lighting, and other equipment. Port management activities are primarily housed in an administration building within the Industrial Park campus. The Board of Commissioners meets once a month.

The Industrial Park comprises 785 acres of a 1600-acre ownership. The park hosts approximately 50 tenants, notably wood products manufacturing and storage, cabinet makers, warehousing and distribution centers for national companies, and a variety of governmental functions. Around 537 acres are contained within an area requiring that derived revenues be dedicated to airport uses.

A small portion of the industrial park lies within the approach zone, restricting its use, while another 248 acres lie outside the airport influence zone. A variety of sites and buildings are available for immediate occupancy. The Port also owns and operates 95 miles of the Southern Pacific branch line, which connects Tillamook with the Portland area.

An RV Park, which is located east of Highway 101 on the west end of the airport environs, is also operated by the Port. The park has 52 campsites with picnic tables, spaces for self-contained RVs, as well as drinking water and restrooms.

AIRPORT SETTING AND ACCESS

The City of Tillamook is the county seat of Tillamook County, Oregon. The city is located on the southeast end of Tillamook Bay, on the Pacific Ocean. It is named for the Native American Tillamook people, a tribe speaking a Salishan language who lived in this area until the early nineteenth century.

Tillamook Airport is located approximately three miles south of the city's central business district. Access to the airport is provided by U.S. Highway 101/Oregon Coast Highway, which serves as a critical transportation link from northwestern Oregon to the rest of the state. Easy connections to Portland (70 miles east) via Highways 6 and 26, and Salem (75 miles southeast) via Highway 22, are within a few miles. The location of Tillamook Airport in its regional setting is depicted on **Exhibit A**.

CLIMATE

Weather conditions are important to the planning and development of an airport. Temperature is an important factor in determining runway length requirements, while wind direction and speed are used to determine optimum runway orientation. The need for navigational aids and lighting is determined by the percentage of time that visibility is impaired due to cloud coverage or other conditions.

Tillamook County lies along the northern part of the Oregon Coast, which is characterized by wet winters, relatively dry summers, and mild temperatures throughout the year due to the marine influences. The area's heavy precipitation results from moist air masses moving off the Pacific Ocean onto land, especially during the winter months. The abundant moisture supports lush pastures for dairy and animal production, as well as valley crops of grass seed, flower bulbs, nuts, and fruits. Snowfall in the coastal vicinity is minimal, usually only one to three inches, although, some of the higher elevations receive significant amounts of snowfall.

Extremely high or low temperatures are rare, and the annual temperature range is lower than any other Oregon climate zone. Temperatures above 90°F occur less than once per year and freezing temperatures are infrequent. The months of July, August, and September tend to be the warmest, but average summer temperatures are only about 15-20 degrees above the coldest month, January. **Table B** summarizes monthly climatic data for Tillamook County.

TABLE B
Climate Conditions
Tillamook County, Oregon

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
Avg. High Temp (°F)	50	53	54	57	61	65	67	69	68	62	55	50
Avg. Low Temp (°F)	36	37	37	39	43	47	50	50	47	42	39	37
Average Precipitation (in.)	13.8	10.1	10.1	6.6	4.4	3.3	1.3	1.7	3.4	7.5	13.2	14.2
Average Snow Fall (in.)	0.7	0.2	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4

Source: Western Regional Climate Center (7/1/1948 – 7/31/2010).

AIRPORT SERVICE AREA

Defining a service area for an airport can be useful in the forecasting process. Once a general service area is identified, various statistical comparisons can be made for projecting aviation demand. For example, in rural areas, where there may be one general aviation airport in each county, the service area could reasonably be defined as the entire county. This would facilitate comparisons to county population and employment for forecasting purposes.

In regions where there are many general aviation airports, the definition of the service area is not as simple. Aircraft owners in areas with more airports have more choices when it comes to basing their aircraft. The most common reason aircraft owners cite for choosing an airport at which to base their aircraft is convenience to home or work. Other reasons may include the capability of the runway system, availability of hangar space, and the services available. Therefore, the primary limiting factor to defining an airport service area is the proximity of other airports that provide a similar or greater level of service.

The service area generally represents where most, but not all, based aircraft will come from. It is not unusual for some based aircraft to be registered outside the county or even outside the state. In regions with several airports in relatively close proximity, service areas will likely overlap to some extent.

A review of public-use airports within 40 nautical miles (nm) of Tillamook Airport has been made to identify and distinguish the type of air service provided in the region. Information pertaining to each airport was obtained from FAA 5010 reports. **Table C** identifies the major characteristics of each airport.

Exhibit A
LOCATION MAP

TABLE C
Public-Use Airports Within 40 nm of Tillamook Airport

Airport Name	Distance (nm)	NPIAS* Role	Longest Runway	Based Aircraft	Annual Operations	Instrument Approaches
Pacific City State	15 SSW	Not Included	1,875'	5	1,980	No
Nehalem Bay State	18 NNW	Not Included	2,350'	None	2,240	No
McMinnville Municipal	32 ESE	GA	5,420'	132	63,510	Yes
Chehalem Airpark	33 E	Not Included	2,285'	31	1,770	No
Skyport Airport	34 ENE	Not Included	2,000'	3	1,980	No
Siletz Bay State	34 SSW	GA	3,300'	15	3,850	No
Vernonia Municipal	35 NE	Not Included	2,940'	5	2,960	No
Portland-Hillsboro	37 ENE	Reliever	6,600'	253	253,675	Yes

Source: FAA 5010 Form.
*National Plan of Integrated Airport Systems.

Pacific City State Airport (owned by the State of Oregon) is located approximately 15 nautical miles south-southwest of Tillamook Airport. The airport is served by a single 1,875-foot runway. There is no control at the airport and there are no published instrument approaches available. There are five aircraft based at Pacific City State Airport. The airport has an average of 38 operations per week. Aircraft tiedowns are available at the airport.

Nehalem Bay State Airport (owned by the State of Oregon) is located approximately 18 nautical miles north-northwest of Tillamook Airport. The airport is served by a single 2,350-foot runway. There is no control tower at the airport and there are no published instrument approaches available. No aircraft are based at Nehalem Bat State Airport. The airport has an average of 43 operations per week, all of which are performed by transient aircraft. Aircraft tiedowns are available at the airport.

McMinnville Municipal Airport (owned by the City of McMinnville) is located approximately 32 nautical miles east-southeast of Tillamook Airport. The airport is served two runways, the longest of which is 5,420 feet. There is no control tower at the airport. Four published instrument approaches are available and 132 aircraft are based at the airport. McMinnville Municipal Airport has an average of 174 operations per day. Services available at the airport include aircraft tiedowns, fuel sales (100LL & Jet A), and aircraft maintenance.

Chehalem Airpark (privately owned) is located approximately 33 nautical miles east of Tillamook Airport. The airport is served by a single 2,285-foot runway. There is no control tower at the airport and there are no published instrument approaches available. There are 31 aircraft based at Chehalem Airpark and the airport has an average of 34 operations per day. Services available include aircraft tiedowns, fuel sales (100LL & Jet A), and aircraft maintenance.

Skyport Airport (privately owned) is located approximately 34 nautical miles east-northeast of Tillamook Airport. The airport is served by a single 2,000-foot runway. There is no control tower at the airport and there are no published instrument approaches available. There are three aircraft based at Skyport Airport. The airport has an average of 38 operations per week and aircraft tiedowns are available.

Siletz Bay State Airport (owned by the Oregon Department of Aviation) is located approximately 34 nautical miles south-southwest of Tillamook Airport. The airport is served by a single 3,300-foot runway. There is no control tower at the airport and there are no published instrument approaches available. There are 15 aircraft based at Siletz Bay State Airport. The airport has an average of 74 operations per week and aircraft tiedowns are available.

Vernonia Municipal Airport (owned by the City of Vernonia) is located approximately 35 nautical miles northeast of Tillamook Airport. The airport is served by a single 2,940-foot runway. There is no control tower at the airport and there are no published instrument approaches available. There are five aircraft based at Vernonia Municipal Airport. The airport has an average of 57 operations per week and aircraft tiedowns are available.

Located approximately 37 miles east-northeast of Tillamook Airport, **Portland-Hillsboro Airport** (owned by the Port of Portland) is a designated reliever airport to Portland International Airport. Portland-Hillsboro Airport is served by two runways, the longest of which is 6,600 feet, and a 16-hour (1600-2200) airport traffic control tower. Approximately 253 aircraft are based at the airport and numerous instrument approaches are approved for use into the airport. The airport has an average of 695 operations per day. Numerous fixed base operators (FBOs) are located on the airfield and provide a full array of general aviation services.

LOCATION OF REGISTERED AIRCRAFT

When discussing the general aviation service area, the main component is the airport's ability to attract aircraft registered in the area. Almost universally, aircraft owners choose to base at an airport nearer their home or business. Convenience is the most common reason for basing in close proximity.

Exhibit B depicts registered aircraft in Tillamook County by the registered aircraft owner's address. This data was compiled from the FAA Aircraft Registry. As shown on the exhibit, the majority of the aircraft in Tillamook County are from residents living within 20 miles of the airport.

AREA LAND USE

Land use surrounding an airport is a critical consideration. It is important for the operator of an airport, particularly a governmental body, to protect the airport environment for the safe operations of aircraft and for the safety of people and property on the ground. Several land use planning agencies and ordinances have some jurisdiction over the airport environment.

Tillamook Airport lies some distance from the urbanized area of the community it serves; therefore, there are very few incompatible land uses in the surrounding area. Predominate land use surrounding the airport is agricultural/farming. Port industrial property surrounds the airport

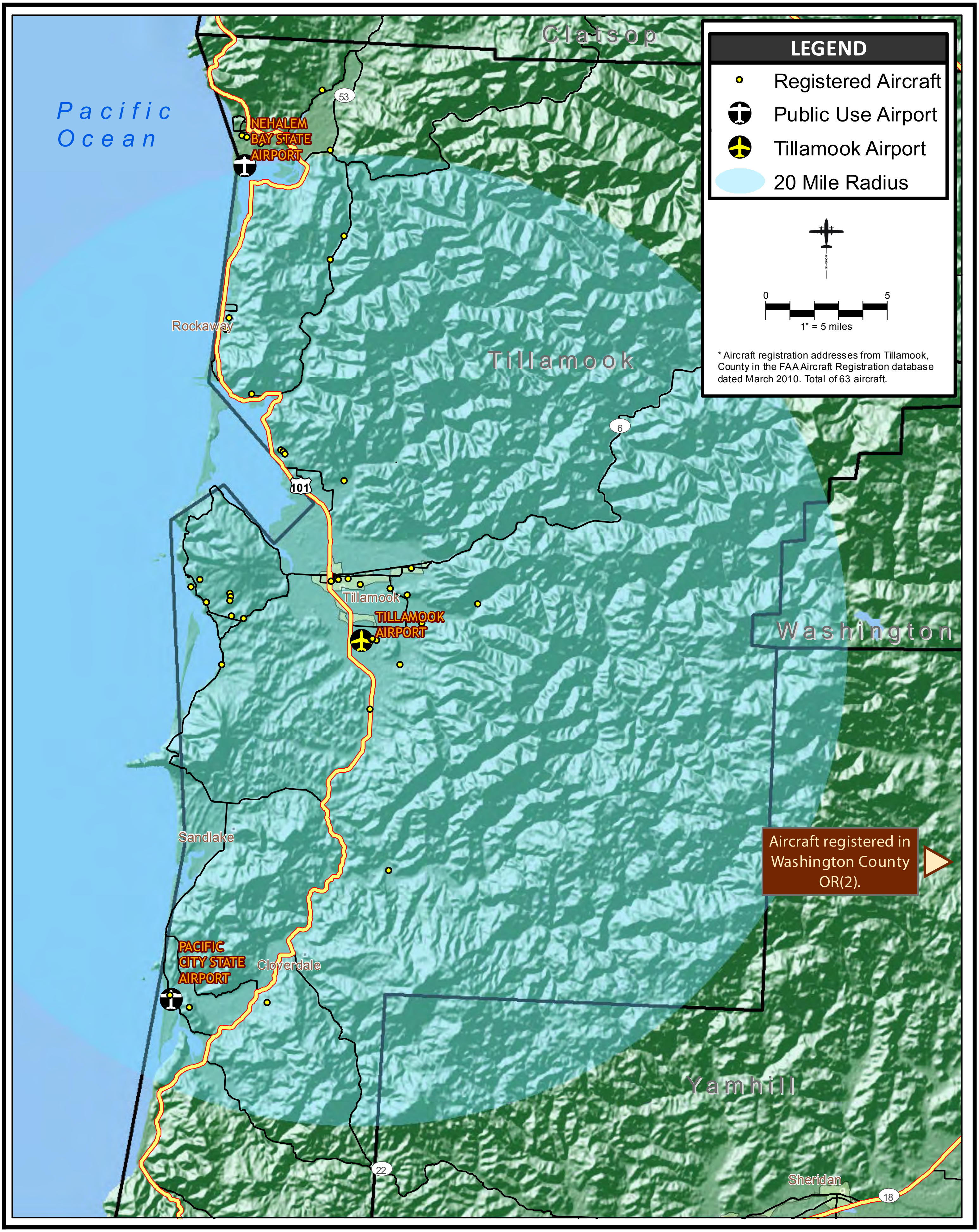


Exhibit B
LOCATION OF REGISTERED AIRCRAFT

on the east. A scattering of residential property lies northwest and southwest of the airport. A cemetery is located adjacent to airport property, east of the Runway 19 end.

HEIGHT AND HAZARD ZONING

Height and hazard zoning in the vicinity of the airport is regulated by Section 3.200, *Tillamook Airport Obstruction Zone*, of the Tillamook County Land Use Ordinance. Specific zones, based on 14 CFR Part 77, *Objects Affecting Navigable Airspace*, have been established in order to regulate the height of objects in the vicinity of the airport. Mapping consistent with the 14 CFR Part 77 will be updated, consistent with the recommendations of this study.

SOCIOECONOMIC CHARACTERISTICS

Socioeconomic characteristics are collected and examined to derive an understanding of the dynamics of growth within the study area. This information assists in determining aviation service level requirements, as well as forecasting the number of based aircraft and aircraft activity at the airport. Aviation forecasts are typically related to the population base, economic strength of the region, and the ability of the region to sustain a strong economic base over an extended period of time.

POPULATION

Historical population totals, which were obtained from the U.S. Census Bureau, are presented in **Table D**. According to the U.S. Census Bureau, the State of Oregon had more than 3.4 million residents in 2000. This is an increase of over half a million residents since 1990, which represents an average annual growth rate of 1.9 percent.

Tillamook County only represents a small portion of Oregon's overall population, and historically, the rate of population growth has been somewhat less than that experienced statewide. Between 1990 and 2000, the county added approximately 2,700 new residents, which represents an average annual growth rate of 1.2 percent.

The current population for both the county and the state were estimated by the Population Research Center, Portland State University on November 15, 2010. Tillamook County's population was estimated at 26,200, while the State of Oregon's population was estimated at 3,844,200. This represents an average annual growth rate of 0.8 percent and 1.2 percent, respectively, over the past decade.

TABLE D
Historical Population – Tillamook County and State of Oregon

Area	1990	2000	2010[1]	Avg. Annual Growth Rate (1990-2000)	Avg. Annual Growth Rate (2000-2010)
Tillamook Co.	21,600	24,300	26,200	1.2%	0.8%
Oregon	2,842,000	3,421,000	3,844,200	1.9%	1.2%

Source: Historical Population - U.S. Census Bureau.
[1]Estimated by the Population Research Center, Portland State University (Nov. 15, 2010).

Population projections for the forecast period are presented in **Table E**. These projections were obtained from 2011 Woods & Poole Economics. According to the study, Tillamook County's population is projected to grow at an average annual rate of 0.5 percent over the planning period, totaling approximately 28,800 residents by 2030. Oregon's population is expected to grow at a slightly faster rate (1.1 percent) during the same period, totaling more than 4.7 million residents by 2030.

TABLE E
Forecast Population

Area	2010[1]	2015	2020	2030	Avg. Annual Growth Rate (2010-2030)
Tillamook Co.	26,200	25,900	26,900	28,800	0.5%
Oregon	3,844,200	4,084,800	4,308,900	4,767,600	1.1%

Source: Forecast Population - 2011 Woods & Poole Economics, Inc.
[1]Estimated by the Population Research Center, Portland State University (Nov. 15, 2010).

EMPLOYMENT

Analysis of a community's employment base can provide valuable insight to the overall well-being of the community. In most cases, the community makeup and health is significantly impacted by the availability of jobs, variety of employment opportunities, and types of wages provided by local employers. Civilian labor force data, which was obtained from the Oregon Labor Market Information System, is presented in **Table F**.

TABLE F
Civilian Labor Force Data

	1990	2000	2010*
Tillamook County			
Civilian Labor Force	9,700	11,500	13,400
Employment	9,100	10,900	12,300
Unemployment	600	600	1,100
Unemployment Rate	5.8%	5.2%	8.4%
State of Oregon			
Civilian Labor Force	1,506,200	1,810,200	1,979,700
Employment	1,424,900	1,717,000	1,783,400
Unemployment	81,300	93,200	196,300
Unemployment Rate	5.4%	5.1%	9.9%
United States			
Civilian Labor Force	125,840,000	142,583,000	153,854,000
Employment	118,793,000	136,891,000	139,715,000
Unemployment	7,047,000	5,692,000	14,139,000
Unemployment Rate	5.6%	4.0%	9.2%

Source: Oregon Labor Market Information System (data not seasonally adjusted).
*As of September 2010.

As shown in the table, Oregon and the United States currently have similar unemployment rates of 9.9 percent and 9.2 percent, respectively. Historically, the county's unemployment rate has been rather consistent with the state. However, currently the county's unemployment rate is somewhat lower than the state's. Overall, the unemployment rates are at all-time highs, which can mainly be attributed to the current economic crisis.

Historically, the Tillamook economy has been based primarily on dairy farms. The farmland surrounding the city is used for grazing the milk cattle that supply the Tillamook County Creamery Association's production of cheese (particularly cheddar), gourmet ice cream and yogurt, and other dairy products. Tillamook is home to the Tillamook Cheese Factory, maker of world famous cheese and ice creams, as well as the nearby Blue Heron cheese factory, offering gourmet food tasting, cheeses, wines, and other gifts in a converted Dutch barn.

There is also a large lumber industry that is experiencing a comeback from the replanting that followed the Tillamook Burn forest fires of the mid-20th century. Nearly 93 percent of Tillamook County is classified as forest land, and one large saw mill and several shake and shingle mills are situated in the county. In addition to privately owned tree farms, extensive acreage is managed by the U.S. Forest Service and Bureau of Land Management, while the Tillamook Burn area is operated by the State Forestry Department.

Tourism is also a significant factor in the county's economy, as visitors flock to the coast and travel up and down U.S. Highway 101. The Tillamook Cheese Visitor Center attracts over one million tourists a year, while the Tillamook County Pioneer Museum attracts nearly 80,000 visitors a year.

AIRPORT FACILITIES

Airport facilities can be functionally classified into two broad categories: airside and landside. The airside category includes those facilities directly associated with aircraft operations. The landside category includes those facilities necessary to provide a safe transition from surface to air transportation and support aircraft servicing, storage, maintenance, and operational safety.

AIRSIDE FACILITIES

Airside facilities include runways, taxiways, airfield lighting, and navigational aids. Airside facilities are identified on **Exhibit C**. **Table G** summarizes airside facility data at Tillamook Airport.

Runway/Taxiway System

Tillamook Airport is served by two intersecting asphalt runways. Runway 13-31, the primary runway, measures 5,001 feet long, 100 feet wide, and is oriented in northwest-southeast manner. Runway 13-31 has pavement strength of 60,000 pounds single wheel loading (SWL), 75,000 pounds dual wheel loading (DWL), and 125,000 dual tandem wheel loading (DTWL). SWL refers to the design of certain aircraft landing gear which has a single wheel on each main landing gear strut. DWL refers to certain aircraft landing gear which has two wheels on each main landing gear strut. DTWL refers to certain aircraft landing gear which has four wheels on each main landing gear strut.

Runway 13-31 slopes downward from the southeast to the northwest, resulting in a 0.4 percent runway gradient (elevation difference between runway high and low points divided by the length of the runway).

Runway 1-19, the secondary runway, measures 2,910 feet long, 75 feet wide, and is oriented in a northeast-southwest manner. The strength rating for Runway 1-19 is 40,000 pounds SWL; 46,000 pounds DWL; and 67,000 pounds DTWL. Runway 1-19 slopes downward from the northeast to the southwest, resulting in a runway gradient of 0.2 percent.

Runway 13-31 is served by a full length taxiway, which is parallel to the runway at each end. This taxiway is located 300 feet from the runway centerline at each end, but angles to the ramp through the Runway 1 threshold. In between, however, the taxiway extends farther out, connecting to the end of Runway 1. The width of this taxiway varies between 50 feet on the northwest end to 40 feet on the southeast end. A series of entrance/exit and connecting taxiways also serve both runways. These connecting taxiways range between 25 and 35 feet in width, as noted on the exhibit.

TABLE G
Airside Facilities Data
Tillamook Airport

	Runway 13-31	Runway 1-19
Runway Length Runway Width	5,001' 100' *	2,910' 75'
Runway Surface Material Condition	Asphalt Good	Asphalt Good
Pavement Markings	Non-Precision	Basic
Runway Load-Bearing Strength (lbs.) Single Wheel Loading (SWL) Dual Wheel Loading (DWL) Dual Tandem Wheel Loading (DTWL)	 60,000 75,000 125,000	 40,000 46,000 67,000
Runway Lighting	Medium Intensity Runway Lighting (MIRL)	
Taxiway Lighting	Reflectors	
Approach Aids	Precision Approach Path Indicator (PAPI-2L)	
Instrument Approach Procedures	RNAV - GPS (Runway 13)	
Weather or Navigational Aids	Automated Weather Observation System (AWOS-3) Segmented Circle & Lighted Wind Cone Rotating Beacon	

* Under an FAA grant accepted in 2011, the runway will be narrowed to 75 feet.

Source: *Airport Facility Directory; Northwest U.S.* (November 18, 2010).

Pavement Markings

Pavement markings aid in the movement of aircraft along airport surfaces and identify closed or hazardous areas on the airport. The non-precision markings on Runway 13-31 identify the runway designations, centerline, touchdown point, and aircraft holding positions. The basic markings on Runway 1-19 identify the runway centerline and designation.

Taxiway and apron centerline markings are provided to assist pilots in maintain-

10MP07-C-09/07/10

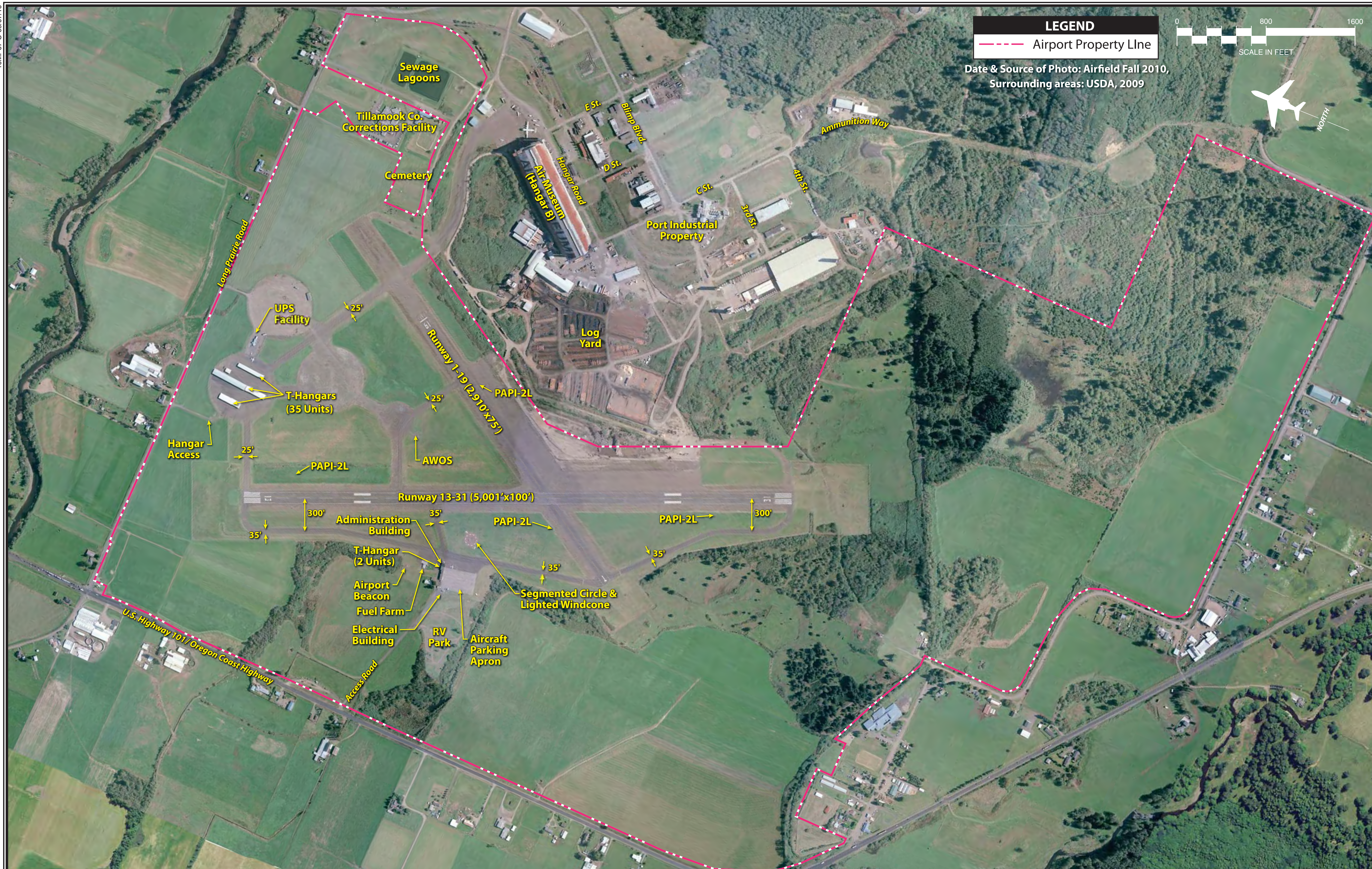


Exhibit C
EXISTING FACILITIES

ing proper clearance from pavement edges and objects near the taxiway/taxilane edges. Pavement markings also identify aircraft tiedown positions and aircraft holding positions.

Airfield Lighting

Airfield lighting systems extend an airport's usefulness into periods of darkness and/or poor visibility. A variety of lighting systems are installed at the airport for this purpose. These lighting systems, categorized by function, are summarized as follows:

Identification Lighting: The location of the airport at night is universally identified by a rotating beacon. The rotating beacon projects two beams of light, one white and one green, 180 degrees apart. The rotating beacon at Tillamook Airport is located north of the aircraft parking apron.

Runway and Taxiway Lighting: Runway and taxiway lighting utilizes light fixtures placed near the edge of the pavement to define the lateral limits of the pavement. This lighting is essential for safe operations during night and/or times of low visibility in order to maintain safe and efficient access to and from the runway and aircraft parking areas. Both runways are equipped with medium intensity runway lighting (MIRL). These are lights set atop a pole that is approximately one foot above the ground. The light poles are frangible, meaning that if one is struck by an object, such as an aircraft wheel, they can easily break away, thus limiting the potential damage to an aircraft. Reflectors are installed along the majority of taxiways.

Visual Approach Lighting: Approaches to both ends of Runway 13-31 and 1-19 are aided by the presence of precision approach path indicator lights (PAPI-2L), which provide visual approach slope guidance. PAPIs consist of a system of lights located at various distances from the runway threshold, which when interpreted by the pilot, give them an indication of being above, below, or on the correct descent path to the runway.

Airfield Signs: Airfield identification signs assist pilots in identifying their location on the airfield and direct them to their desired location. Limited directional signage is installed at Tillamook Airport.

Pilot-Controlled Lighting: With the pilot-controlled lighting (PCL) system, pilots can turn on the airfield lights from their aircraft through a series of clicks of their radio transmitter. The lighting systems at Tillamook Airport are capable of being activated via PCL.

Weather Facilities

The airport is equipped with a lighted wind cone, which provides pilots with information about wind conditions, and a segmented circle, which provides traffic pattern information to pilots. The lighted wind cone and segmented circle are located west of Runway 13-31, at midfield.

Tillamook Airport is also equipped with an Automated Weather Observation System (AWOS-3). An AWOS automatically records weather conditions such as wind speed, wind gusts, wind direction, temperature, dew point, altimeter setting, and density altitude. In addition, the AWOS-3 will record visibility, precipitation, and cloud height. This information is then transmitted at regular intervals. The AWOS-3 is located west of Runway 1-19, at midfield.

Navigational Aids

Navigational aids are electronic devices that transmit radio frequencies, which pilots of properly equipped aircraft can translate into point-to-point guidance and position information. The types of electronic navigational aids available for aircraft operating in the vicinity of Tillamook Airport include the nondirectional beacon (NDB), the very high frequency omnidirectional range (VOR) facility, and the global positioning system (GPS).

The NDB transmits nondirectional signals whereby the pilot of an aircraft equipped with direction-finding equipment can determine their bearing to and from the radio beacon in order to track to the beacon station. The Banks NDB, located approximately 35 nautical miles northeast, can be utilized by pilots flying to or from Tillamook Airport.

A VOR, in general, provides azimuth readings to pilots of properly equipped aircraft transmitting a radio signal at every degree to provide 360 individual navigational courses. Frequently, distance measuring equipment (DME) is combined with a VOR facility (VOR/DME) to provide distance as well as direction information to the pilot. Military tactical air navigation aids (TACANs) and civil VORs are commonly combined to form a VORTAC. The VORTAC provides distance and direction information to both civil and military pilots. The Newberg VOR/DME, located approximately 36 nautical miles east, can be utilized by pilots flying to or from Tillamook Airport.

GPS is an additional navigational aid for pilots. GPS was initially developed by the United States Department of Defense for military navigation around the world. GPS differs from VOR in that pilots are not required to navigate using a specific ground-based facility. GPS uses satellites placed in orbit around the earth that transmit electronic radio signals, which pilots of properly equipped aircraft use to determine altitude, speed, and other navigational information. With GPS, pilots can navigate directly to any airport in the country and are not required to navigate using a ground-based navigational facility.

Instrument Approach Procedures

Instrument approach procedures are a series of predetermined maneuvers established by the FAA using electronic navigational aids that assist pilots in locating and landing at an airport during low visibility and cloud ceiling conditions. There is currently one published instrument approach to Tillamook Airport: RNAV (GPS) Runway 13. Utilizing this approach, a properly equipped aircraft can land at the airport with 800-foot cloud ceilings and one mile visibility for aircraft in approach categories A and B. Visibility increases for aircraft in approach category C. This GPS approach can also be utilized as a circling approach.

LANDSIDE FACILITIES

Landside facilities are the ground-based facilities that support the aircraft and pilot/passenger handling functions. These facilities typically include the terminal building, aircraft storage/maintenance hangars, aircraft parking aprons, and support facilities such as fuel storage, automobile parking, roadway access, and aircraft rescue and firefighting. Landside facilities are identified on **Exhibit C**.

Administration Building

The administration building at Tillamook Airport is located near the aircraft parking apron and self-serve fueling facility. This building totals approximately 1,100 square feet and provides a pilot lounge, weather reporting, restrooms, and telephones. Limited automobile parking is provided, adjacent to the administration building.

Tillamook Air Museum

The Tillamook Air Museum is housed in Hangar B on the east side of the airfield. Hangar B, which is one of the largest clear-span wooden structures in world, is a former military blimp hangar that the U.S. Navy used to store dirigibles during WWII. Hangar B is one of two hangars that were originally built on the site. Hangar A was destroyed by a fire in 1992. The museum currently has about three dozen aircraft in its collection, a number of which are still actively flying.

Aircraft Storage Facilities

Aircraft storage facilities at Tillamook Airport (on-airport) consist of several T-hangars. As depicted on **Exhibit C**, three T-hangars are located on the north side of the airfield, while a fourth T-hangar is located on the west side of the field. Together, these four T-hangars total approximately 60,000 square feet and provide storage for approximately 37 aircraft. Two conventional hangars are located north of Hangar B (off-airport), providing approximately 12,800 square feet of storage capacity. Hangar B also provides storage for active aircraft based on the airport (in addition to static aircraft on display).

Aircraft Parking Apron

As depicted on **Exhibit C**, Tillamook Airport has one apron area for itinerant aircraft parking. This apron is located on the west side of the airfield, adjacent to the administration building. This paved apron is approximately 7,000 square yards and provides capacity for up to 12 aircraft.

Aircraft Fueling

An aircraft fuel farm is located just north of the aircraft parking apron. Self-service AvGas and Jet A fuel (capacity of 12,000 gallons each) are available 24-hours a day from two aboveground fuel tanks.

AIRSPACE CHARACTERISTICS

To ensure a safe and efficient airspace environment for all aspects of aviation, the FAA has established an airspace structure that regulates and establishes procedures for aircraft using the National Airspace System. The U.S. airspace structure provides two basic categories of airspace, controlled and uncontrolled, and identifies them as Classes A, B, C, D, E, and G. All aircraft operating within Classes A, B, C, and D airspace must be in contact with the air traffic control facility responsible for that particular airspace. Class E airspace is controlled airspace that encompasses all instrument approach procedures and low-altitude federal airways. Only aircraft conducting instrument flights are required to be in contact with the air traffic control when operating in Class E airspace. Aircraft conducting visual flights in Class E airspace are not required to be in radio communications with air traffic control facilities. Visual flight can only be conducted if minimum visibility and cloud ceilings exist. Class G airspace is uncontrolled airspace that does not require contact with an air traffic control facility.

Airspace in the vicinity of Tillamook Airport is depicted on **Exhibit D**. Class E airspace surrounds the airport, with the floor beginning at 700 feet above the surface and extending to 18,000 feet mean sea level (MSL).

Victor Airways are corridors of airspace eight miles wide that extend upward from 1,200 feet above ground level (AGL) to 18,000 feet MSL and extend between VOR navigational facilities. V27 runs north-south along the coastline. The other Victor Airways noted on the exhibit emanate from the Newberg VOR-DME or Battleground VORTAC.

SPECIAL USE AIRSPACE

Oregon is also home to numerous national parks, forests, and wildlife areas. These areas are identified as "wilderness areas" on **Exhibit D**. Because the government regards these areas as noise-sensitive, many of their boundaries are marked on aeronautical charts. Pilots are requested to maintain a minimum altitude of 2,000 feet AGL when over these areas.

AIR TRAFFIC CONTROL

There is no control tower at Tillamook Airport; therefore, no formal terminal air traffic control services are available for aircraft landing or departing the airport. Aircraft operating in the vicinity of the airport are not required to file any type of flight plan or to contact any air traffic control facility unless they are entering airspace where contact is mandatory. The common traffic advisory frequency (CTAF) is used by pilots to obtain airport information and advise other aircraft of their position in the traffic pattern and their intentions.

Tillamook Airport is located within the jurisdiction of the Seattle Air Route Traffic Control Center (ARTCC). The McMinnville Flight Service Station (FSS) provides additional weather data and other pertinent information to pilots on the ground and enroute.

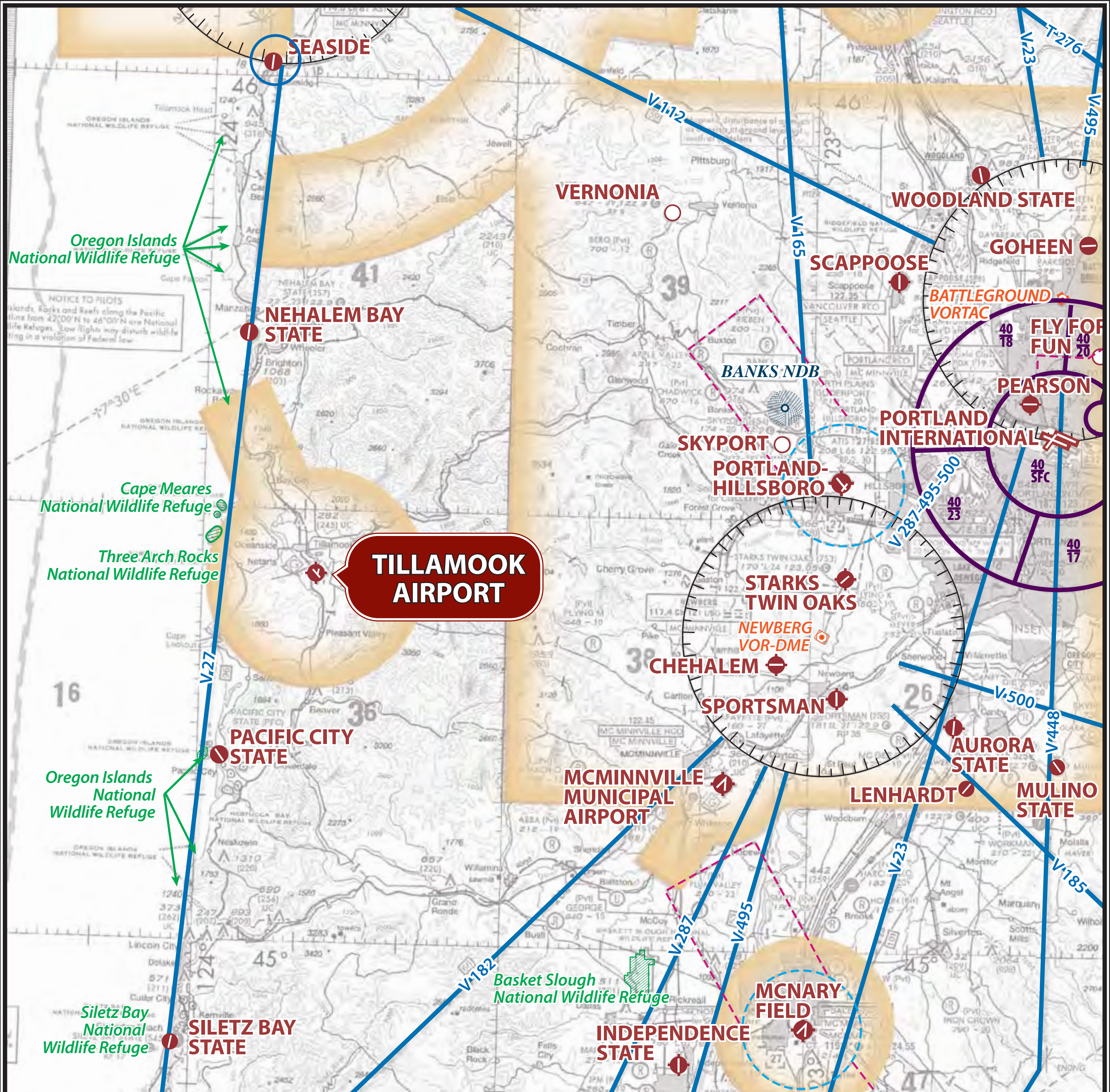
LOCAL OPERATING PROCEDURES

Tillamook Airport is situated at 36 feet MSL. The traffic pattern altitude is 1,000 feet above the elevation of the airport surface. Runways 1, 13, and 31 utilize a left-hand traffic pattern, while Runway 19 utilizes a right-hand traffic pattern.

FAA FORECASTS AND TRENDS

Each year, the FAA updates and publishes a national aviation forecast. Included in this publication are forecasts for passengers, airlines, air cargo, general aviation, and FAA workload measures. The fore-

10MP07-D-10/16/10



LEGEND

- Airport with other than hard-surfaced runways
- Airport with hard-surfaced runways 1,500' to 8,069' in length
- Airports with hard-surfaced runways greater than 8,069' or some multiple runways less than 8,069'
- VORTAC
- VOR-DME
- Non-Directional Radiobeacon (NDB)
- Compass Rose
- Wilderness Areas
- Victor Airways
- Class C Airspace (Mode C)
- Class D Airspace
- Class E (sfc) Airspace
- Class E Airspace with floor 700 ft. above surface

NORTH

NOT TO SCALE

Source:
Seattle South Sectional Charts, US Department of Commerce, National Oceanic and Atmospheric Administration 8/26/10

Exhibit D
VICINITY AIRSPACE

casts are prepared to meet the budget and planning needs of the constituent units of the FAA and to provide information that can be used by state and local authorities, the aviation industry, and the general public.

The current edition when this chapter was prepared was FAA *Aerospace Forecast - Fiscal Years 2010-2030*, published in March 2010. The forecasts use the economic performance of the United States as an indicator of future aviation industry growth. Similar economic analyses are applied to the outlook for aviation growth in international markets.

NATIONAL TRENDS

The economic downturn has also dampened the near-term prospects for the general aviation industry. After several consecutive years of growth, general aviation activity fell 5.6 percent in 2008. Worldwide shipments of new general aviation aircraft declined in 2008 for the first time since 2002 (down 6.7 percent). Piston aircraft shipments fell 20.7 percent, but turbine aircraft shipments increased by 16.7 percent. Total billings for general aviation aircraft were up 14.4 percent in 2008, demonstrating the sharp difference in demand between piston and turbine aircraft.

GENERAL AVIATION TRENDS

Following more than a decade of decline, the general aviation industry was revitalized with the passage of the *General Aviation Revitalization Act* in 1994, which limits the liability on general aviation aircraft to 18 years from the date of manufacture. This legislation sparked an interest to renew the manufacture of general aviation aircraft due to the reduction in product liability, as well as renewed optimism for the industry. The high cost of product liability insurance had been a major factor in the decision by many American aircraft manufacturers to slow or discontinue the production of general aviation aircraft.

In the seven years prior to the events of September 11, 2001, the U.S. civil aviation industry experienced unprecedented growth in demand and profits. The impacts to the economy and aviation industry from the events of 9/11 were immediate and significant. The economic climate and aviation industry had been recovering until early 2008 when it became clear that an economic downturn was underway. High oil prices and an economic recession caused general aviation activity at FAA air traffic facilities to fall sharply in 2008, declining by 5.6 percent. The downturn in the economy has dampened the near-term prospects for the general aviation industry. As the U.S. and world economy recovers, general aviation demand is anticipated to rebound and grow.

The National Bureau of Economic Research announced that the U.S. economy entered into recession in December 2007. As the economic downturn gathered momentum, the new Administration and Congress passed the American Recovery and Reinvestment Act (ARRA) in February 2009, which was estimated to have a total fiscal impact of $787 billion. Data shows that the bottom of the recession was hit in June 2009 and the freefall in economic activity tempered during the third quarter of 2009. The U.S. economy grew for the first time in fourth quarter 2009, with output increasing by 2.2 percent. Economic growth is expected to be slow and not strong enough to halt the decline in jobs until later in 2010. Sustained economic growth above three percent is not expected until 2011. Beyond 2015, U.S. real gross domestic product (GDP) growth slows to around 2.6 percent annually through the forecast period.

In 2009, there were an estimated 229,149 active general aviation aircraft in the United States. **Exhibit E** depicts the FAA forecast for active general aviation aircraft. The FAA projects an average annual increase of 0.9 percent through 2030, resulting in 278,723 active aircraft. Active piston-powered aircraft are expected to decline through 2017, then gradually increase to 172,613 by 2030 for an overall average annual increase of 0.2 percent. This is driven primarily by a 3.4 percent annual increase in piston-powered rotorcraft and growth in experimental and sport aircraft, as single engine fixed-wing piston aircraft are projected to increase at just 0.2 percent annually, and multi-engine fixed-wing piston aircraft are projected to decrease by 0.8 percent per year. This is due, in part, to declining numbers of multi-engine piston aircraft and the expectation that the new, light sport aircraft and the relatively inexpensive microjets will dilute or weaken the replacement market for piston aircraft.

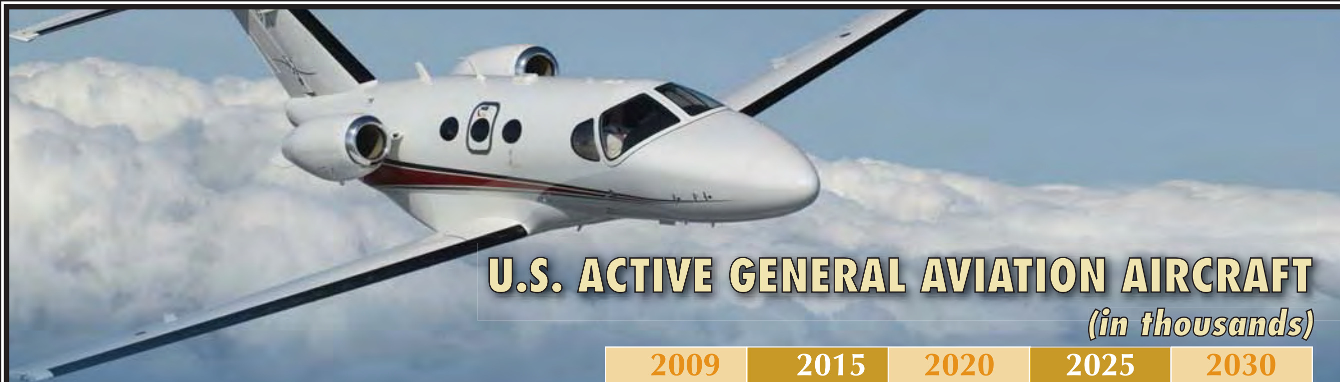
New models of business jets are also stimulating interest for the high-end market. The FAA expects the business segment to expand at a faster rate than personal/sport flying. Safety and security concerns combined with increased processing time at commercial terminals make business/ corporate flying an attractive alternative. Turbine-powered aircraft (turboprop and jet) are expected to grow at an average annual rate of 3.1 percent over the forecast period. Even more significantly, the jet portion of this fleet is expected to grow at an average annual growth rate of 4.2 percent. The total number of jets in the general aviation fleet is projected to grow from 11,418 in 2009, to 27,035 by 2030.

With the advent of a relatively inexpensive twin-engine very light jet (VLJ), many questions have arisen as to the future impact they may have. The lower acquisition and operating costs of the VLJs were believed to have the potential to revolutionize the business jet market, particularly by being able to sustain a true on-demand air-taxi service. While initial forecasts called for over 400 aircraft to be delivered a year, events such as the recession along with the bankruptcy of Eclipse and DayJet have led the FAA to temper more recent forecasts. The introduction of the Embraer's Phenom 100 to the market has helped boost the turbine market. Despite that, the impacts of the recession have led to dampened expectations. VLJs are forecast to grow by 440 aircraft through 2013, then average 216 aircraft per year through the remainder of the forecast period.

Owners of ultralight aircraft began registering their aircraft as "light sport" aircraft in 2005. At the end of 2008, a total of 6,811 aircraft were estimated to be in this category. The FAA estimates this fleet will increase by approximately 825 aircraft per year until 2013, and then taper off to about 335 per year. By 2030, a total of 16,311 light sport aircraft are projected to be in the fleet.

Aircraft utilization rates are projected to increase through the forecast period. The number of general aviation hours flown is projected to increase at 2.5 percent annually. Similar to active aircraft projections, there is projected disparity between piston and turbine aircraft hours flown.

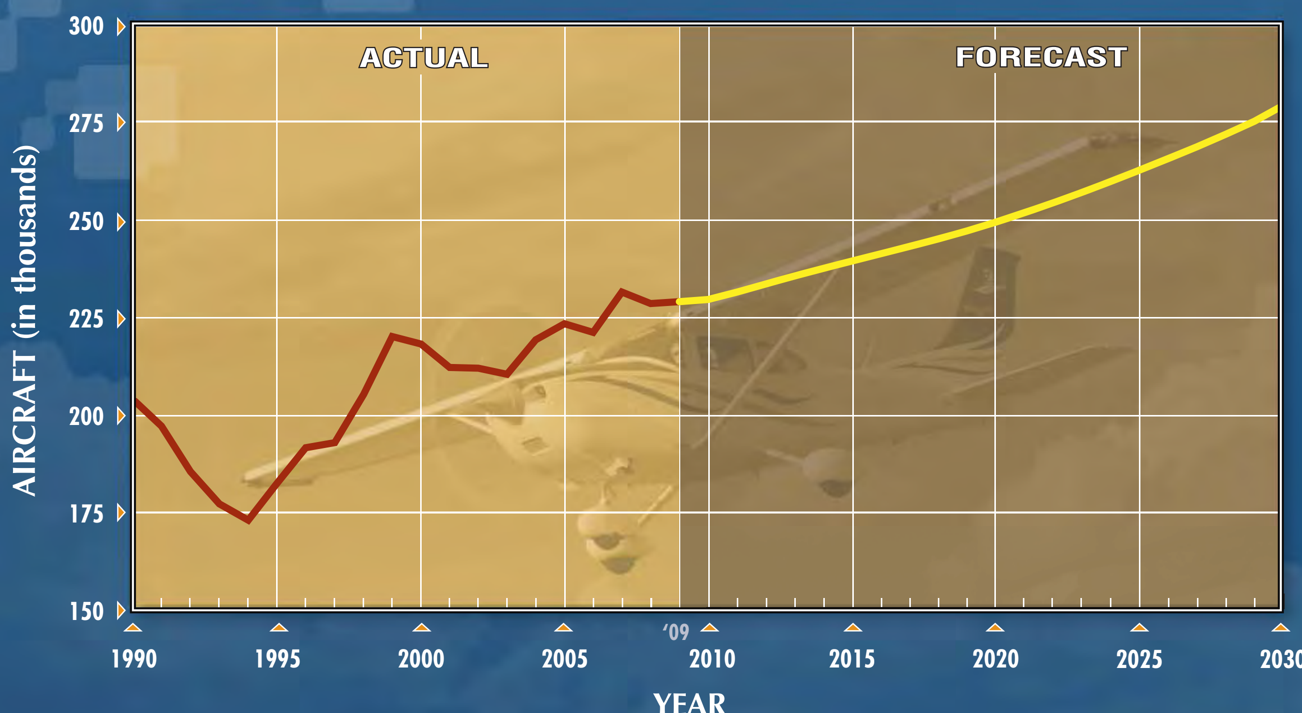
08MP04-E-6/10/10



U.S. ACTIVE GENERAL AVIATION AIRCRAFT

(in thousands)

	2009	2015	2020	2025	2030
FIXED WING					
PISTON					
Single Engine	144.7	141.9	142	145.3	150.6
Multi-Engine	17.3	16.5	15.8	15.2	14.6
TURBINE					
Turboprop	9	9.8	10.5	11.3	12
Turbojet	11.4	14.5	17.9	22.1	27
ROTORCRAFT					
Piston	3.7	4.7	5.6	6.5	7.4
Turbine	6.6	7.8	8.8	9.8	10.8
EXPERIMENTAL	23.4	27	29.8	32.2	34.4
SPORT AIRCRAFT	7.3	11.6	13.3	14.8	16.3
OTHER	5.7	5.7	5.7	5.6	5.6
TOTAL	229.1	239.5	249.4	262.8	278.7



Source: FAA Aerospace Forecasts, Fiscal Years 2010-2030.

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

Exhibit E
U.S. ACTIVE GENERAL AVIATION
AIRCRAFT FORECASTS

Hours flown in turbine aircraft are expected to increase at 4.1 percent annually, compared with 1.1 percent for piston-powered aircraft. Jet aircraft hours flown are projected to increase at 6.1 percent annually over the next 20 years. The sport aircraft fleet is anticipated to experience a 5.9 percent average annual growth rate in hours flown through 2030.

The total general aviation pilot population is projected to increase by 52,000 in the next 20 years, reaching 501,875 in 2030, which represents an average annual growth rate of 0.5 percent. The student pilot population is forecast to increase at an annual rate of 0.8 percent, reaching a total of 86,050 in 2030. Growth rates for other pilot categories over the forecast period are as follows: recreational pilots remaining constant, private pilots increasing by 0.2 percent, commercial pilots increasing 0.5 percent, airline transport pilots increasing 0.6 percent, rotorcraft-only pilots increasing 1.6 percent, and glider-only pilots increasing 0.2 percent. The sport pilot is expected to grow significantly through 2030 at 7.2 percent annually.

Over the past several years, the general aviation industry has launched a series of programs and initiatives whose main goals are to promote and assure future growth within the industry. Several programs are intended to promote growth in new pilot starts and introduce people to general aviation. "Project Pilot," sponsored by the Aircraft Owners and Pilots Association (AOPA), promotes the training of new pilots in order to increase and maintain the size of the pilot population. The Experimental Aircraft Association (EAA) promotes the "Young Eagles" program which introduces young children to aviation by offering them a free airplane ride courtesy of aircraft owners who are part of the association. Over the years, programs such as these have played an important role in the success of general aviation and will continue to be vital to its growth in the future.

FORECASTS OF AVIATION DEMAND

An important factor in facility planning involves a definition of demand that may reasonably be expected to occur during the useful life of the facility's key components. For Tillamook Airport, this involves projecting potential aviation demand for a 20-year timeframe. In this report, forecasts of annual operations, based aircraft, and based aircraft fleet mix will serve as the basis for facility planning.

The resulting forecast may be used for several purposes, including facility needs assessments, airfield capacity evaluation, and environmental evaluations. The forecasts will be reviewed and approved by the FAA to ensure that they are reasonable projections of aviation activity. The intent is to permit the Port of Tillamook Bay to make the necessary planning adjustments to ensure the facility meets projected demands in an efficient and cost-effective manner.

Because aviation activity can be affected by many influences at the local, regional, and national levels, it is important to remember that forecasts are to serve only as guidelines, and planning must remain flexible enough to respond to unforeseen facility needs.

FORECASTING APPROACH

The development of aviation forecasts proceeds through both analytical and judgmental processes. A series of mathematical relationships is tested to establish statistical logic and rationale for projected growth. However, the judgment of the forecast analyst, based upon professional experience, knowledge of the aviation industry, and assessment of the local situation is important in the final determination of the preferred forecast. The most reliable approach to estimating aviation demand is through the utilization of more than one analytical technique. Methodologies frequently considered include time-series/trend line projections, correlation/regression analysis, and market share analysis.

Time-series/trend line projections are probably the simplest and most familiar of the forecasting techniques. By fitting growth curves to historical data, then extending them into the future, a basic trend line projection is produced. A basic assumption of this technique is that outside factors will continue to affect aviation demand in much the same manner as in the past. As broad as this assumption may be, the trend line projection does serve as a reliable benchmark for comparing other projections.

Correlation analysis provides a measure of direct relationship between two separate sets of historic data. Should there be a reasonable correlation between the data sets, further evaluation using regression analysis may be employed.

Regression analysis measures statistical relationships between dependent and independent variables, yielding a "correlation coefficient." The correlation coefficient (Pearson's "r") measures association between the changes in the dependent variable and the independent variable(s). If the r^2 value (coefficient determination) is greater than 0.95, it indicates good predictive reliability. A value less than 0.95 may be used, but with the understanding that the predictive reliability is lower.

Market share analysis involves a historical review of the airport activity as a percentage, or share, of a larger regional, state, or national aviation market. A historical market share trend is determined, providing an expected market share for the future. These shares are then multiplied by the forecasts of the larger geographical area to produce a market share projection. This method has the same limitations as trend line projections, but can provide a useful check on the validity of other forecasting techniques.

It is important to note that one should not assume a high level of confidence in forecasts that extend beyond five years. Facility and financial planning usually require at least a 10-year preview since it often takes more than five years to complete a major facility development program. However, it is important to use forecasts which do not overestimate revenue-generating capabilities or understate demand for facilities needed to meet public (user) needs.

BASED AIRCRAFT

The number of based aircraft is the most basic indicator of general aviation demand. By first developing a forecast of based aircraft, the growth of aviation activities at the airport can be projected. Aircraft basing at the airport is somewhat dependent upon the nature and degree of aircraft ownership in the local service area. As a result, aircraft registrations in the area were first reviewed and forecast.

Registered Aircraft Forecasts

Table H outlines the historic registered aircraft in Tillamook County since 1993. This information was obtained from records of the FAA's Aircraft Registry. According to the FAA, there were 31 aircraft registered in Tillamook County in 1993. This number has since increased, with 64 registered aircraft currently reported in the county for 2010. This represents an annual average growth rate of 4.4 percent. There are no recently prepared forecasts of registered aircraft to examine and compare. As a result, a projection of county registrations was developed for this study.

Due to the fluctuation in the number of registered aircraft over the past ten years, time-series and regression analyses yielded correlation coefficients too low to have any predictive reliability. Therefore, none of the time-series or regression analyses were carried forward in this study, and other methods were used to provide projections of registered aircraft.

TABLE H
Historical Registered Aircraft
Tillamook County

Year	Registered Aircraft	Annual % Change
1993	31	-
1994	39	25.8%
1995	41	5.1%
1996	40	-2.4%
1997	37	-7.5%
1998	41	10.8%
1999	43	4.9%
2000	45	4.7%
2001	40	-11.1%
2002	40	0.0%
2003	44	10.0%
2004	48	9.1%
2005	48	0.0%
2006	47	-2.1%
2007	56	19.1%
2008	55	-1.8%
2009	61	10.9%
2010	64	4.9%

Source: FAA Aircraft Registry.

As a starting point, the historical growth rate of registered aircraft in Tillamook County was examined. As previously mentioned, registered air-craft has grown at an average annual rate of 4.4 percent since 1993. However, due to the fluctuation in registered aircraft between 1993 and 2001, only the growth rate during the past ten years was applied to the 20-year forecast. Registered aircraft has grown at a rate of 3.6 percent since 2000. This growth rate was applied to the forecast years and yields 135 registered aircraft in the county by the year 2030.

Another method examined the population of Tillamook County as a comparison with registered aircraft in the county. **Table J** presents historical registered aircraft as a ratio of 1,000 residents in the county. The county's ratio has fluctuated between a low of 1.63 in 2001 and 2002 to a current high of 2.44 in 2010. A constant ratio projection was applied to the forecast years and yields 70 registered aircraft in Tillamook County by 2030. An increasing ratio projection was also developed to represent the historical trend and yields 101 registered aircraft in Tillamook County by 2030.

TABLE J
Registered Aircraft Forecasts
Tillamook County

Year	Tillamook Co. Registered Aircraft	Tillamook Co. Population	AC Per 1,000 Residents	U.S. Active GA Aircraft	% of U.S. Active GA Aircraft
2000	45	24,300	1.85	217,500	0.021%
2001	40	24,600	1.63	211,500	0.019%
2002	40	24,600	1.63	211,300	0.019%
2003	44	24,900	1.77	209,600	0.021%
2004	48	25,000	1.92	219,300	0.022%
2005	48	25,200	1.90	224,400	0.021%
2006	47	25,500	1.84	221,900	0.021%
2007	56	25,800	2.17	231,600	0.024%
2008	55	26,000	2.12	228,700	0.024%
2009	61	26,100	2.34	229,100	0.027%
2010	64	26,200	2.44	229,700	0.028%
***Constant Ratio Projection Per 1,000 Residents* (Tillamook County)**					
2015	63	25,900	2.44		
2020	66	26,900	2.44		
2030	70	28,800	2.44		
***Increasing Ratio Projection Per 1,000 Residents* (Tillamook County)**					
2015	65	25,900	2.50		
2020	81	26,900	3.00		
2030	101	28,800	3.50		
Constant Market Share Projection of U.S. Active GA Aircraft					
2015	67			239,500	0.028%
2020	69			249,400	0.028%
2030	78			278,700	0.028%
Increasing Market Share Projection of U.S. Active GA Aircraft					
2015	72			239,500	0.030%
2020	82			249,400	0.033%
2030	111			278,700	0.040%

Source: Historical Registered Aircraft – FAA; Historical and Forecast U.S. Active GA Aircraft - FAA *Aerospace Forecasts, Fiscal Years 2010-2030* (March 2010); Historical Population – U.S. Census Bureau; Forecast Population – 2011 Woods & Poole Economics, Inc.
[1]Estimated by the Population Research Center, Portland State University (Nov. 15, 2010).

An additional method considered the county's market share of U.S. active general aviation aircraft. This market share analysis compared the county's aircraft ownership trends versus national aircraft ownership trends. As evidenced in **Table J**, the county's share of U.S. active general aviation aircraft has fluctuated between a low of 0.019% in 2002 and a current high of 0.028% in 2010. A constant market share projection of 0.028% was applied to the forecast years and yields 78 registered aircraft in Tillamook County by 2030. An increasing ratio projection was also developed to reflect the overall historical trend since 2000 and yields 110 registered aircraft in Tillamook County by 2030.

Table K and **Exhibit F** summarize the registered aircraft forecasts for Tillamook County. The selected planning forecast is an average of the five newly developed forecasts by Coffman Associates. This forecast yields 100 registered aircraft in Tillamook County by 2030, which represents an average annual growth rate of 2.1 percent.

TABLE K
Summary of Registered Aircraft Forecasts
Tillamook County

	2010	2015	2020	2030
3.6 % Historical Growth Rate (2000-2010)		76	91	135
Registered Aircraft Per 1,000 Residents (Tillamook Co.)				
Constant Ratio Projection		63	66	70
Increasing Ratio Projection		65	81	101
Market Share of U.S. Active GA Aircraft				
Constant Market Share Projection		67	69	78
Increasing Market Share Projection		72	82	111
Selected Planning Forecast (2.1% AAGR)	**64**	**70**	**80**	**100**

Based Aircraft Forecasts

According to airport records, there are currently 44 aircraft based at Tillamook Airport. It should be noted that eight of these aircraft are hangared in the Air Museum (Hangar B) as part of their collection. They are included in the based aircraft count because they are aircraft that are actively flying, and therefore contributing to operations at the airport.

The based aircraft forecast is a function of the registered aircraft forecast completed above. Previous forecasts of based aircraft were first examined for this study. Forecasts included in the *2007 Oregon System Plan* used a base number of 43 based aircraft in 2005 and projects 53 based aircraft by 2025. This represents an average annual growth rate of 1.1 percent.

The FAA *Terminal Area Forecasts* (TAF), which was published in December 2010, was also examined. The FAA TAF used a base year of 2009, with an estimated 45 based aircraft. The FAA TAF projects 59 based aircraft at Tillamook Airport by 2030, which represents an average annual growth rate of 1.3 percent.

A newly developed forecast examines the airport's based aircraft market share of registered aircraft in Tillamook County. As shown in **Table L**, the 44 based aircraft at Tillamook Airport currently account for 69 percent of the aircraft registered in the county. Historical annualized based aircraft totals were not available for this study.

A forecast was developed assuming the airport will capture a percentage (or share) of the county's registered aircraft over the planning period. This share is shown to slightly decline over time to reflect a steady increase in based aircraft through the planning period and yields 65 based aircraft by 2030.

TABLE L Based Aircraft Market Share Forecast (Tillamook County)			
Year	Tillamook Based Aircraft	Tillamook County Registered Aircraft	Market Share of Reg. AC
2010	44	64	69%
Market Share Projection of Registered Aircraft (Tillamook County)			
2015	50	70	69%
2020	55	80	68%
2030	65	100	65%
Source: Historical Based Aircraft – Airport Records; Historical Registered Aircraft – FAA Aircraft Registry.			

Table M and **Exhibit G** summarize the based aircraft forecasts for Tillamook Airport. This selected planning forecast yields 65 based aircraft by 2030, which represents a 2.0 percent average annual growth rate. This results in the airport's number of based aircraft increasing at a steady rate of approximately one per year.

It is important to note that the actual percentage of area-wide aircraft that base at Tillamook Airport in the future will depend on availability of hangars, rental rates, and services offered by airport businesses.

TABLE M Summary of Based Aircraft Forecasts Tillamook Airport	2010	2015	2020	2030
2007 Oregon System Plan		48	50[1]	N/A
2010 FAA Terminal Area Forecast		48	51	59
Market Share of Reg. Aircraft (Tillamook Co.) **(Selected Planning Forecast) (2.0% AAGR)**	**44**	**50**	**55**	**65**
[1]Interpolated				

Based Aircraft Fleet Mix

While the total number of general aviation aircraft based at Tillamook Airport is projected to increase, it is also important to know the type of aircraft expected to base at the airport. This will ensure the planning of proper facilities in the future. According to airport records, the current mix of aircraft based at the airport consists of 31 single engine aircraft, five multi-engine aircraft, and eight ultralight/experimental aircraft (including balloons). This based aircraft count includes the active six single engine aircraft and two multi-engine aircraft currently hangared in the museum.

The forecast mix of based aircraft was determined by comparing existing and forecast U.S. general aviation fleet trends to the fleet mix at Tillamook Airport. The

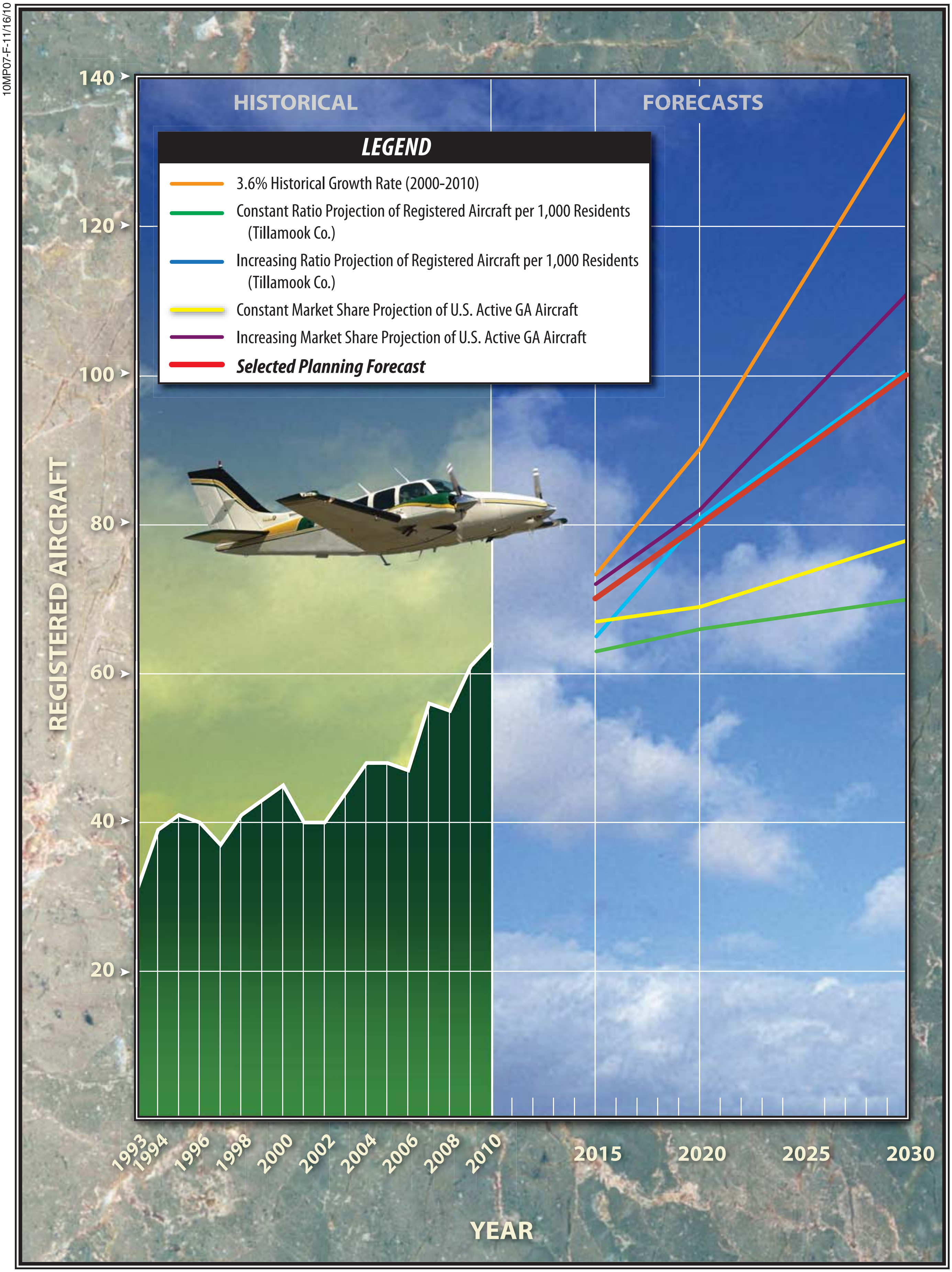


Exhibit F
REGISTERED AIRCRAFT
FORECAST SUMMARY

10MP10-G-11/16/10

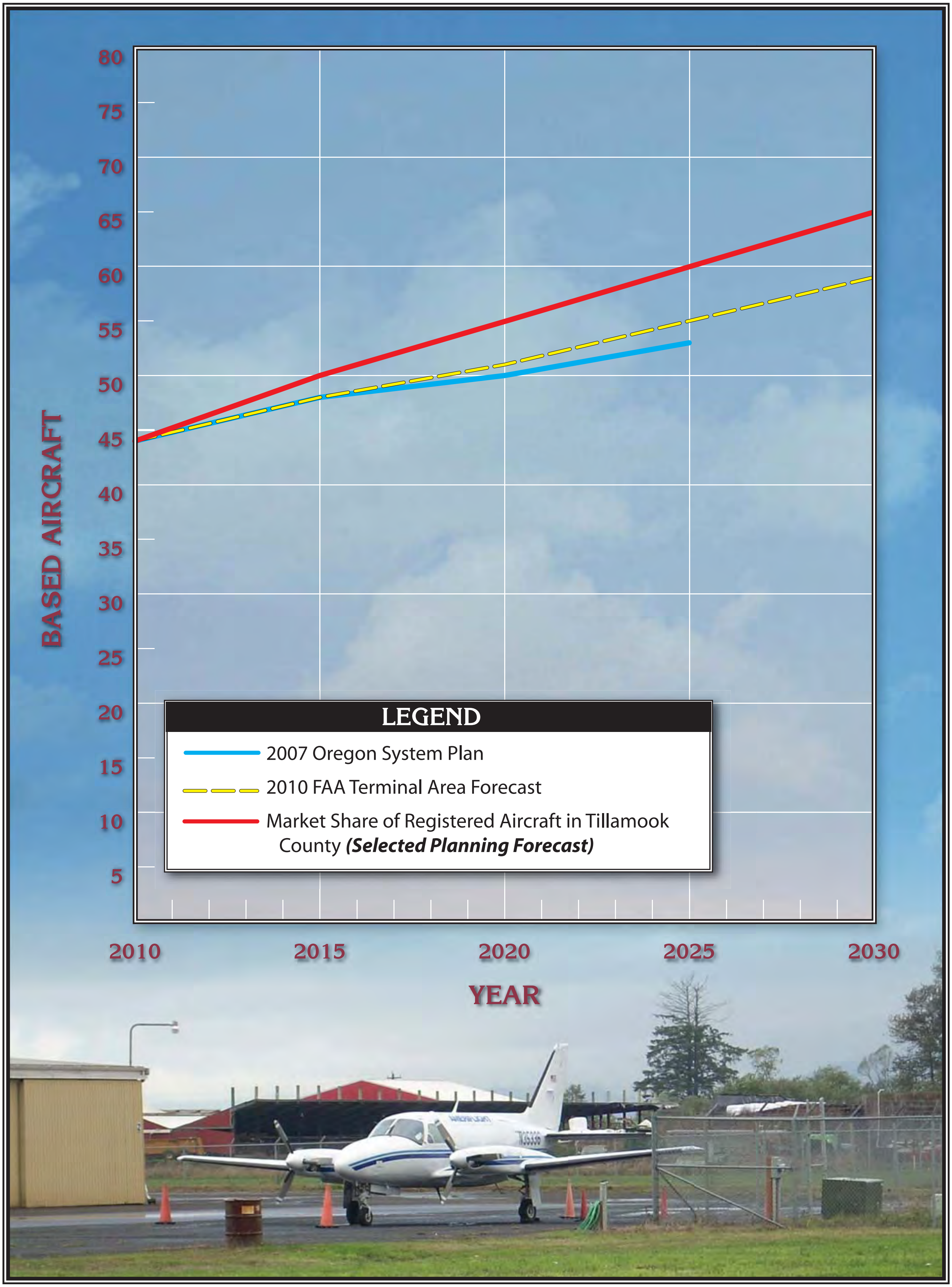


Exhibit G
BASED AIRCRAFT
FORECAST SUMMARY

national trend in general aviation is toward a greater percentage of larger, more sophisticated aircraft as part of the national fleet. While an increase in single engine aircraft can be expected, their percentage of the total fleet mix will likely decrease. Meanwhile, the percentage of multi-engine aircraft is projected to increase by nearly eight percent by the end of the planning period, while the percentage of ultralight/experimental aircraft is projected to remain near 18 percent. It could also be expected that Tillamook Airport's based aircraft mix may include a few smaller jets in the future. The fleet mix projections for Tillamook Airport are presented in **Table N**.

TABLE N
Based Aircraft Fleet Mix
Tillamook Airport

Year	Total	Single Engine	Multi-Engine	Jets	Ultralights/ Experimental
2010	44	31	5	0	8
2015	50	34	6	1	9
2020	55	35	8	2	10
2030	65	38	12	3	12
Net Change	+21	+7	+7	+3	+4
2010	100.0%	70.4%	11.4%	0.0%	18.2%
2015	100.0%	68.0%	12.0%	2.0%	18.0%
2020	100.0%	64.0%	15.0%	3.0%	18.0%
2030	100.0%	58.0%	19.0%	5.0%	18.0%

Source: Airport Records.

GENERAL AVIATION OPERATIONS

General aviation operations are classified as either local or itinerant. A local operation is a take-off or landing performed by an aircraft that operates within sight of the airport, or which executes simulated approaches or touch-and-go operations at the airport. Itinerant operations are those performed by aircraft with a specific origin or destination away from the airport. Generally, local operations are characterized by training operations. Typically, itinerant operations increase with business and commercial use, since business aircraft are not typically used for large scale training activities.

Previous forecasts were first examined. The 2007 *Oregon System Plan* used a base year of 2005, with an estimated 10,500 general aviation op-erations. The 2007 plan projects 13,000 annual general aviation operations by 2025, which represents a 1.1 percent annual growth rate. The most recent FAA TAF was published in December 2010. This forecast used 2009 as the base year for its forecasts, with an estimated 10,800 annual general aviation operations that year. The FAA TAF projects approximately 13,700 annual general aviation operations by 2030, which represents a 1.1 percent annual growth rate.

Airport records were also examined. The airport keeps daily logs of airport activity between the hours of 8:00 a.m. and 5:00 p.m. A review of these logs for the years 2005 and 2009 show an estimated number of 6,400 annual operations and 6,900 operations, respectively, within the recorded activity periods. Late evening and early morning activity would be expected to increase the total counts by ten percent.

When tower reports are not available, the FAA Statistics and Forecast Branch recommends using the *Model for Estimating General Aviation Operations at Non-Towered Airports* (July 2001). This report develops and presents a regression model for estimating general aviation (GA) operations at non-towered airports. Independent variables used in the equation include airport characteristics (i.e., number of based aircraft, number of flight schools, population totals, and geographic location).

Applying this equation yields an initial 7,700 annual general aviation operations, which equates to 175 operations per based aircraft and is consis-tent with similar airports of this size. The activity logs for 2005 and 2009 would also seem to validate this methodology.

From this, a constant projection of 175 operations per based aircraft was developed and yields 11,400 annual general aviation operations by 2030, which represents an average annual growth rate of 2.0 percent. Based on a review of airport logs, it was estimated that the operational split is 85 percent itinerant and 15 percent local. This percentage was assumed through the planning period. **Table P** presents the general aviation operations forecast for Tillamook Airport.

TABLE P
General Aviation Operations Forecasts
Tillamook Airport

Year	Based Aircraft	Itinerant Operations	Local Operations	Total Operations	Ops Per Based Aircraft
2010	44	6,500	1,200	7,700[1]	175
Constant Ratio Projection					
2015	50	7,400	1,300	8,700	175
2020	55	8,200	1,400	9,600	175
2030	65	9,700	1,700	11,400	175

[1]2010 Estimate of operations – Derived from *Model for Estimating General Aviation Operations at Non-Towered Airports, Equation #15*, FAA Statistics and Forecast Branch (July 2001).

General Aviation Peaking Characteristics

Many airport facility needs are related to the level of activity during peak periods. The periods used in developing facility requirements for this study are as follows:

- **Peak Month –** The calendar month when peak activity occurs.

- **Design Day –** The average day in the peak month. This indicator is derived by dividing the peak month activity by the number of days in the month.

- **Busy Day –** The busy day of a typical week in the peak month.

- **Design Hour –** The peak hour within the design day.

It is important to realize that only the peak month is an absolute peak within the year. Each of the other periods will be exceeded at various times during the year. However, each provides reasonable planning standards that can be applied without overbuilding or being too restrictive.

Typically, the peak month for general aviation operations represents between 10 and 12 percent of the air-port's annual operations. For this analysis, a review of the airport logs in 2005 and 2009 revealed the peak month for both years was July, which represented 14 percent of the annual operations. Forecasts of peak month activity have been developed by applying this percentage to the forecasts of annual operations.

Design day operations were calculated by dividing the total number of operations in the peak month by the number of days in the month. The design hour is projected as 15 percent of the design day operations. Busy day operations were calculated as 1.25 times busier than the design day activity. **Table Q** summarizes the general aviation peak activity forecasts.

TABLE Q
Peak Period Forecasts
Tillamook Airport

		FORECASTS		
	2010	**2015**	**2020**	**2030**
General Aviation Operations				
Annual	7,700	8,700	9,600	11,400
Peak Month (14.0% of annual)	1,080	1,220	1,340	1,600
Design Day (avg. of peak month)	36	41	45	53
Busy Day (125% of design day)	45	51	56	67
Design Hour (15.0% of design day)	5	6	7	8

AIR CARGO OPERATIONS

Air cargo service at Tillamook Airport is provided for UPS by Ameriflight, which operates the twin-engine Piper Chieftain, a 7,000-pound (gross takeoff weight) stretched and more powerful version of the Piper Navajo with a 41-foot wingspan (B-I design group). They operate a daily flight (five days a week), arriving at Tillamook Airport at 8:30 a.m. and departing at 4:30 p.m. On occasion, other turboprop aircraft operated for air cargo will divert to Tillamook.

AIR TAXI OPERATIONS

The air taxi category includes aircraft involved in on-demand "for hire" passenger, small parcel transport, and air ambulance activity on a scheduled or nonscheduled basis. The air taxi category comprises aircraft designed to have a maximum capacity of 60 seats or weighing less than 18,000 pounds. This category includes a wide range of civil aircraft conducting charter operations as well.

Air taxi operations at Tillamook Airport were estimated at ten percent of itinerant operations. This equates to an estimated 700 air taxi operations for the base year.

Table R presents the air taxi operations forecast at Tillamook Airport. Assuming air taxi operations will continue to account for ten percent of itinerant operations, approximately 1,100 air taxi operations are projected by the end of the planning period.

TABLE R
Air Taxi Operations Forecast
Tillamook Airport

Year	Air Taxi Operations
2010	700
2015	900
2020	1,000
2030	1,100

MILITARY OPERATIONS

Military activity accounts for the smallest portion of the operational traffic at Tillamook Airport and are estimated at 100 annual itinerant operations. This is not anticipated to change significantly in the future.

This section has provided forecasts for each sector of aviation demand anticipated over the planning period. A summary of the aviation forecasts developed for Tillamook Airport is presented on **Exhibit H**.

In the following section, existing components of the airport are evaluated so that the capacities of the overall sys-tem are identified. Once identified, the existing capacity is compared to the planning horizon milestones to determine where deficiencies currently exist or may be expected to materialize in the future. Once deficiencies in a component are identified, a more specific determination of the appropriate sizing and timing of the new facilities can be made.

AIRFIELD REQUIREMENTS

Airfield requirements include the need for those facilities related to the arrival and departure of aircraft. The adequacy of existing airfield facilities at Tillamook Airport has been analyzed from a number of perspectives, including airfield design standards, imaginary surfaces, runway use, runway length, runway pavement strength, airfield lighting, navigational aids, and pavement markings.

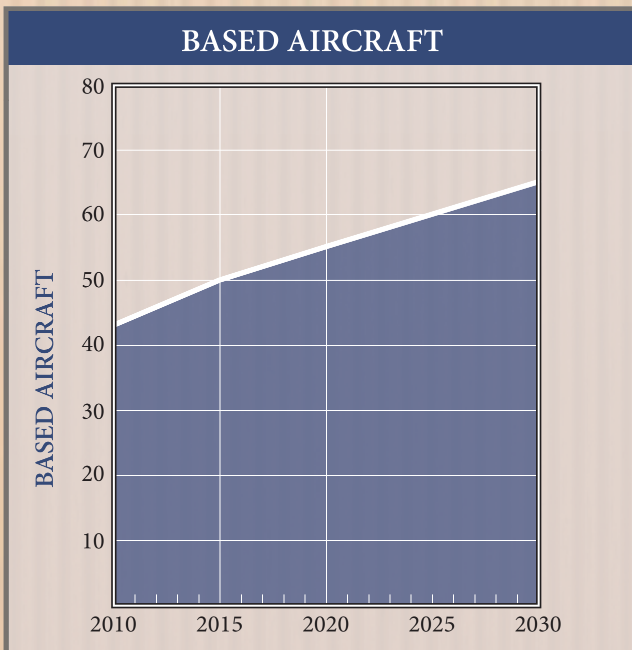
AIRFIELD DESIGN STANDARDS

The FAA has established a coding system to relate airport design criteria to the operational and physical characteristics of aircraft expected to use the airport. This code, the airport reference code (ARC), has two components. The first component, depicted by a letter, is the aircraft approach speed (operational characteristic). The second component, depicted by a Roman numeral, is the airplane design group (ADG) and relates to aircraft wingspan (physical characteristic). Generally, aircraft approach speed applies to runways and runway-related facilities, while aircraft wingspan primarily relates to separation criteria involving taxiways, taxilanes, and landside facilities.

According to FAA Advisory Circular (AC) 150/5300-13, *Airport Design*, an aircraft's

10MP10-H-11/16/09

	ACTUAL	FORECAST		
	2010	2015	2020	2030
ANNUAL OPERATIONS				
Itinerant				
Air Taxi	700	900	1,000	1,100
Air Cargo	500	500	500	500
Military	100	100	100	100
General Aviation	6,500	7,400	8,200	9,700
Total Itinerant	**7,800**	**8,900**	**9,800**	**11,400**
Local				
General Aviation	1,200	1,300	1,400	1,700
Total Local	**1,200**	**1,300**	**1,400**	**1,700**
TOTAL OPERATIONS	***9,000***	***10,200***	***11,200***	***13,100***
BASED AIRCRAFT				
Single Engine	31	34	35	38
Multi-Engine	5	6	8	12
Jets	0	1	2	3
Ultralights/Experimental	8	9	10	12
TOTAL BASED AIRCRAFT	***44***	***50***	***55***	***65***



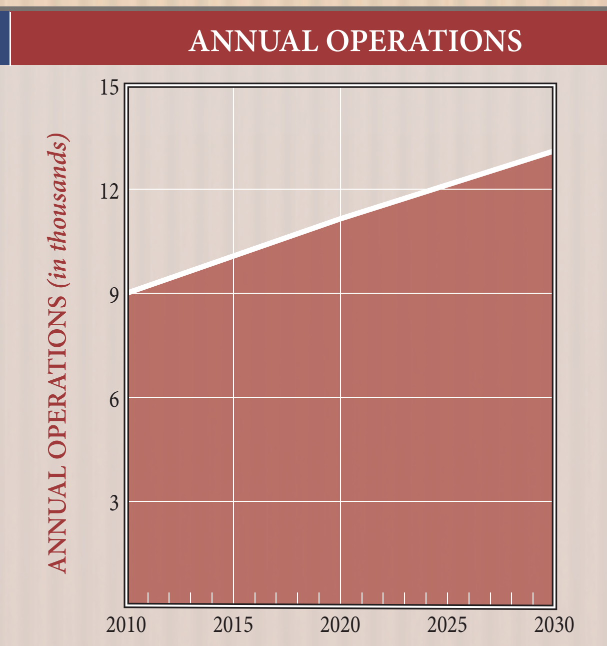


Exhibit H
FORECAST SUMMARY

approach category is based upon 1.3 times its stall speed in landing configuration at that aircraft's maximum certificated weight. The five approach categories used in airport planning are as follows:

Category A: Speed less than 91 knots.

Category B: Speed 91 knots or more, but less than 121 knots.

Category C: Speed 121 knots or more, but less than 141 knots.

Category D: Speed 141 knots or more, but less than 166 knots.

Category E: Speed greater than 166 knots.

The ADG is based upon the aircraft's wingspan and tail height. The six ADGs used in airport planning are as follows:

Group I: Up to but not including 49 feet wingspan or tail height up to but not including 20 feet.

Group II: 49 feet up to but not including 79 feet wingspan or tail height from 20 up to but not including 30 feet.

Group III: 79 feet up to but not including 118 feet wingspan or tail height from 30 up to but not including 45 feet.

Group IV: 118 feet up to but not including 171 feet wingspan or tail height from 45 up to but not including 60 feet.

Group V: 171 feet up to but not including 214 feet wingspan or tail height from 60 up to but not including 66 feet.

Group VI: 214 feet up to but not including 262 feet wingspan or tail height from 66 up to but not including 80 feet.

Exhibit J provides a listing of typical aircraft and their associated ARC. In order to determine airfield design requirements, the critical aircraft and critical ARC should first be determined before appropriate airport design criteria is applied. This begins with a review of aircraft currently using the airport and those expected to use the airport through the 20-year planning period.

CRITICAL AIRCRAFT

The FAA recommends designing airport functional elements to meet the requirements of the most demanding ARC for that airport (minimum of 500 annual itinerant operations). Tillamook Airport currently accommodates a wide variety of civilian aircraft, including small single and multi-engine aircraft (which fall within approach categories A and B and airplane design groups I and II) and business turboprop and jet aircraft (which fall within approach categories B, C, and D and airplane design groups I, II, and III). No single aircraft provides 500 annual itinerant operations. While the airport is used by a number of helicopters, they are not included in this determination as they are not assigned an ARC.

The existing ARC for the primary Runway (Runway 13-31) is B-II. This ARC includes all general aviation aircraft, as well as the majority of the business aircraft currently using the airport. While aircraft in higher ARCs may use the airport, they are not expected to contribute more than 500 annual itinerant operations and are limited by weight and takeoff and landing requirements. The forecasts anticipate increasing utilization by small single and multi-engine aircraft, as well as business turboprop and jet aircraft throughout the planning period. The potential mix of aircraft will continue to place primary Runway 13-31 in the B-II category. Secondary Runway 1-19 is currently classified as a B-I runway; however, its current width allows it to satisfy the requirements of a B-II runway.

AIRPORT IMAGINARY SURFACES

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

The RSA is "a defined surface surrounding the runway prepared or suitable for reducing the risk of damage to airplanes in the event of an undershoot, overshoot, or an excursion from the runway." An object free area is an area on the ground centered on the runway, taxiway, or centerline, provided to enhance the safety of aircraft operations, except for objects that need to be located in the OFA for air navigation or aircraft ground maneuvering purposes. An obstacle free zone is a volume of airspace that is required to be clear of objects, except for frangible items required for navigation of aircraft. It is centered along the runway and extended runway centerline. The RPZ is defined as an area off the runway end to enhance the protection of people and property on the ground. The RPZ is trapezoidal in shape and centered about the extended runway centerline. The dimensions of an RPZ are a function of the runway ARC and approach visibility minimums.

The FAA has placed a higher significance on maintaining adequate RSAs at all airports. On October 1, 1999, the FAA established Order 5200.8, *Runway Safety Area Program*. The order states that all RSAs at federally-obligated airports shall conform to the standards contained in Advisory Circular 150/5300-13, *Airport Design*, to the extent practicable.

Presented in **Table S** are the FAA runway design standards as they apply to Tillamook Airport. Runway 13-31 and Runway 1-19 meet the FAA design standards for a B-II runway and B-I runway, respectively. The existing RPZ on the end of Runway 13 extends beyond the existing airport property. However, the airport has acquired an avigation easement for this portion of the RPZ. Avigation easements are property rights acquired by an airport whenever land use around an airport needs to be controlled or when air rights and/or ob-struction removal is required. Such an easement often prohibits the property owner from installing structures that exceed a specified height.

AIRFIELD REQUIREMENTS

As indicated earlier, airfield facilities include those facilities that are related to the arrival, departure, and ground movement of aircraft. These components include:

- Runways
- Taxiways
- Airfield Lighting, Marking, and Signage
- Navigational Approach Aids

10MP10-J-11/04/10

A-I

- Beech Baron 55
- **Beech Bonanza**
- Cessna 150
- Cessna 172
- Cessna Citation Mustang
- Eclipse 500
- Piper Archer
- Piper Seneca

C-I, D-I

- Beech 400
- **Lear 25, 31, 35, 45, 55, 60**
- Israeli Westwind
- HS 125-400, 700

B-I less than 12,500 lbs.

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

C-II, D-II

- Cessna Citation III, VI, VIII, X
- **Gulfstream II, III, IV**
- Canadair 600
- ERJ-135, 140, 145
- CRJ-200/700
- Embraer Regional Jet
- Lockheed JetStar

B-II less than 12,500 lbs.

- **Super King Air 200**
- Cessna 441
- DHC Twin Otter

C-III, D-III

- ERJ-170, 190
- CRJ 700, 900
- Boeing Business Jet
- **B 737-300 Series**
- MD-80, DC-9
- Fokker 70, 100
- A319, A320
- Gulfstream V
- Global Express

B-I, B-II over 12,500 lbs.

- Super King Air 350
- Beech 1900
- Jetstream 31
- Falcon 10, 20, 50
- Falcon 200, 900
- **Citation II**, III, IV, V
- Saab 340
- Embraer 120

C-IV, D-IV

- **B-757**
- B-767
- C-130
- DC-8-70
- MD-11

A-III, B-III

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

D-V

- **B-747** Series
- B-777

Note: Aircraft pictured is identified in bold type.

Exhibit J
AIRPORT REFERENCE CODES

TABLE S Airfield Safety Area Dimensional Standards Tillamook Airport	FAA Standards	
Airport Reference Code	**B-II**	**B-I**
Approach Visibility Minimum	Visual and ≥ 1-Mile	Visual
Runway Width	75	60
Runway Centerline To:		
Holding Position	200	200
Parallel Taxiway Centerline	225	240
Aircraft Parking Area	200	250
Runway Safety Area (RSA)		
Width	150	120
Length Prior to Landing Threshold	300	240
Length Beyond Runway End	300	240
Runway Object Free Area (OFA)		
Width	500	400
Length Beyond Runway End	300	240
Runway Obstacle Free Zone (OFZ)		
Width	400	250
Length Beyond Runway End	200	200
Runway Protection Zone (RPZ)		
Inner Width	500	500
Outer Width	700	700
Length	1,000	1,000
Source: FAA AC 150/5300-13, *Airport Design*.		

RUNWAYS

The adequacy of the existing runway system at Tillamook Airport has been analyzed from a number of perspectives, including runway orientation, runway length, pavement strength, width, and adherence to safety area standards. From this information, requirements for runway improvements were determined for the airport.

Runway Orientation

Runway use is normally dictated by wind conditions. The direction of take-offs and landings are generally determined by the speed and direction of the wind. For the operational safety and efficiency of an airport, it is desirable for the principal runway of an airport's runway system to be oriented as close as possible to the direction of the prevailing wind. This reduces the impact of crosswind components during landing or takeoff.

Tillamook Airport is served by two intersecting asphalt runways: Runway 13-31, which is oriented in northwest-southeast manner, and Runway 1-19, which is oriented in a northeast-southwest manner. Generally, FAA design standards specify that additional runway configurations are needed if the runway configuration provides less than 95 percent wind coverage at specific crosswind components. The 95 percent wind coverage is computed on the basis of crosswinds not exceeding 10.5 knots for small aircraft weighing less than 12,500 pounds and from 13 to 20 knots for aircraft weighing over 12,500 pounds.

Using the most current wind data specific to Tillamook Airport (which was available for the 2004-2010 time period), a new analysis has been completed. **Exhibit K** presents the wind rose for the airport and summarizes wind coverage based on this data. As shown in the table on the exhibit, Runway 13-31 provides greater than 95% coverage for the 10.5 knot, 13 knot, and 16 knot crosswind components. Runway 1-19 also provides greater than 95% coverage for the 10.5 knot, 13 knot, and 16 knot crosswind components. The original layout of the airfield took advantage of the best approach/departure corridors, and Runway 13-31 provides slightly better coverage on the primary runway. Therefore, the existing runway configuration should continue to serve the airport.

Runway Length

Runway length requirements have been developed using FAA AC 150/5325-4B, *Runway Length Requirements for Airport Design*. This program groups general aviation aircraft by category and by anticipated stage length needs. Local site specific data for elevation, temperature, and runway gradient are used in the calculations. **Table T** summarizes the FAA's generalized recommended runway lengths for Tillamook Airport.

Based upon the FAA's design length requirements, local conditions call for a runway length of at least 4,800 feet. This would accommodate 100 percent of small airplanes, including those with 10 or more passenger seats and 100 percent of large airplanes at 60 percent useful load. Only if a specific aircraft is identified as having more than 500 annual itinerant operations will greater runway lengths be considered.

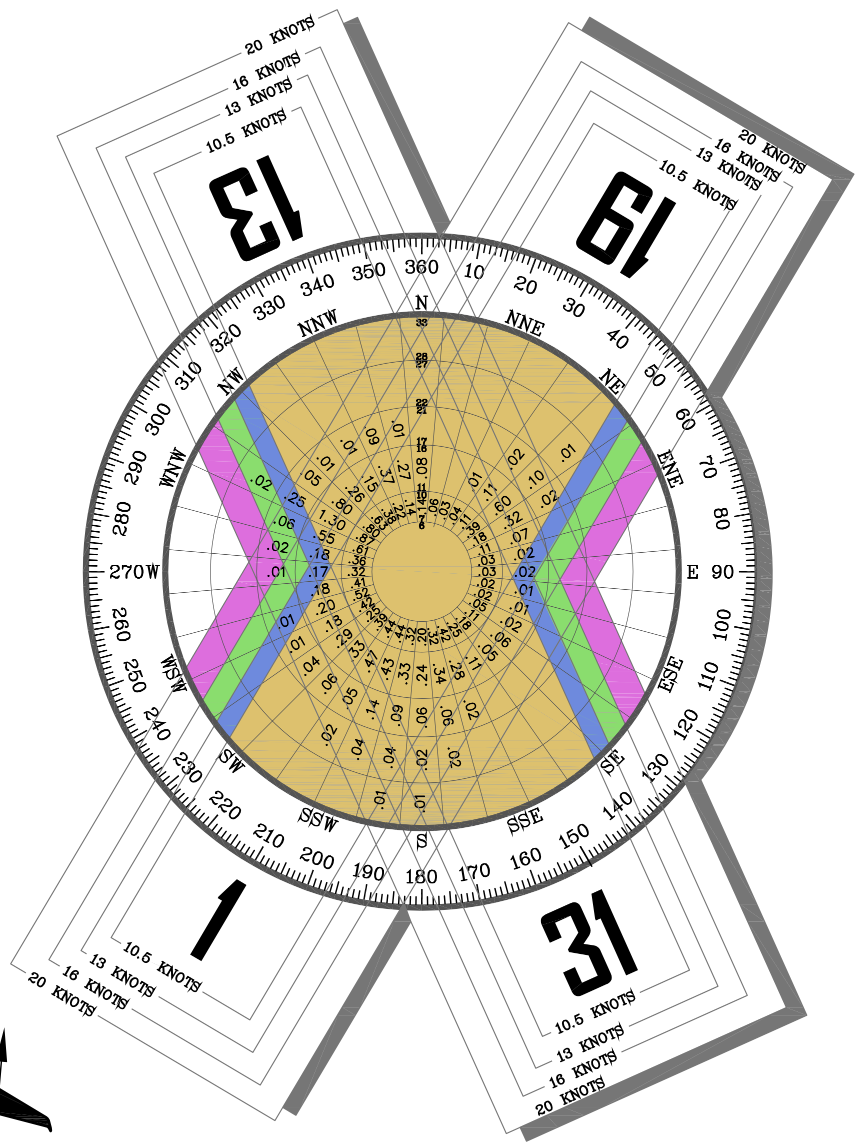
TABLE T
Runway Length Requirements
Tillamook Airport

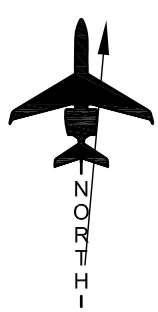
AIRPORT AND RUNWAY DATA	
Airport elevation	36 feet
Mean daily maximum temperature of the hottest month	68.0° F
Maximum difference in runway centerline elevation	19 feet
Length of haul for airplanes of more than 60,000 pounds	500 miles
RUNWAY LENGTHS RECOMMENDED FOR AIRPORT DESIGN	
Small airplanes with less than 10 passenger seats	
95 percent of these small airplanes	2,900 feet
100 percent of these small airplanes	3,400 feet
Small airplanes with 10 or more passenger seats	3,800 feet
Large airplanes of 60,000 pounds or less	
75 percent of these large airplanes at 60 percent useful load	4,600 feet
75 percent of these large airplanes at 90 percent useful load	5,800 feet
100 percent of these large airplanes at 60 percent useful load	4,800 feet
100 percent of these large airplanes at 90 percent useful load	6,800 feet
Airplanes of more than 60,000 pounds	5,000 feet

Reference: FAA AC 150/5325-4B, *Runway Length Requirements for Airport Design.*

ALL WEATHER WIND COVERAGE

Runways	10.5 Knots	13 Knots	16 Knots	20 Knots
Runway 1-19	*95.13%*	*97.26%*	*99.32%*	*99.85%*
Runway 13-31	*95.52%*	*97.63%*	*99.45%*	*99.90%*
Combined	*98.97%*	*99.77%*	*99.96%*	*99.99%*





Magnetic Declination
16° 28' East (September 2010)
Annual Rate of Change
00° 00' West (September 2010)

SOURCE:
NOAA National Climatic Center
Asheville, North Carolina
Tillamook Airport
Tillamook, Oregon

OBSERVATIONS:
28,149 All Weather Observations
2004-2010

Exhibit K
ALL WEATHER WINDROSE

Runway Width

Runway width is based upon the planning ARC for each runway. For ARC B-II runways (visual and $\geq$ 1-mile visibility), the FAA specifies a width of 75 feet. Runway 13-31 is currently 100 feet wide, exceeding this requirement. Under an FAA grant agreement accepted by the POTB in 2011, the runway will be narrowed to 75 feet. For ARC B-I runways, the FAA specifies a width of 60 feet. At 75 feet wide, Runway 1-19 currently exceeds this requirement.

Runway Pavement Strength

The most important feature of airfield pavement is its ability to withstand repeated use by aircraft of significant weight on a regular basis. While the pavement strength rating is not the maximum weight limit, aircraft weigh-ing more than the certified strength can only operate on the runway on an infrequent basis. Heavy aircraft operations can shorten the life span of airport pavements.

The existing pavement strengths for both runways at Tillamook Airport are presented in **Table U**. These strengths will be sufficient through the planning period.

TABLE U
Runway Pavement Strength
Tillamook Airport

Runway 13-31	Runway 1-19
60,000 SWL	40,000 SWL
75,000 DWL	46,000 DWL
125,000 DTWL	67,000 DTWL

Source: FAA 5010 Form.

TAXIWAYS

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

Runway 13-31 is served by a full length taxiway, which is parallel to the runway at each end, as well as several connecting taxiways. Runway 1-19 is served only by a series of entrance/exit and connecting taxiways. The existing efficiency of the taxiway system at Tillamook Airport should be examined and taxiways will need to be added to connect to any future landside development.

The FAA has established standards for taxiway width and runway/taxiway separation distances. Taxiway width is determined by the ADG of the most demanding aircraft. According to FAA design standards, the minimum taxiway width is 35 feet for ADG II. All the taxiways serving Runway 13-31 are at least 35 feet wide. The minimum taxiway width for ADG I is 25 feet. All of the connecting taxiways serving Runway 1-19 meet or exceed this requirement.

Design standards for the separation distances between runways and parallel taxiways are based primarily on the ARC for that particular runway and the type of instrument approach capability. The parallel taxiway serving Runway 13-31 is located 300 feet from the runway centerline at its nearest point, which exceeds the 240-foot FAA design standards for an ARC B-II runway. Runway 1-19 is not supported by a parallel taxiway.

Holding aprons provide an area for aircraft to prepare for departure off the taxiway and allow aircraft that are ready for departure to bypass other aircraft. Neither runway is currently supported with holding aprons. Facility planning should include developing holding aprons on both ends of Runway 13-31.

AIRFIELD MARKING, LIGHTING, AND SIGNAGE

Runway markings are designed according to the type of instrument approach available on the runway. FAA AC 150/5340-1J, *Marking of Paved Areas on Airports*, provides the guidance necessary to design an airport's markings.

Non-precision markings currently exist on Runway 13-31, while basic markings exist on Runway 1-19. These markings are sufficient and should be maintained.

Taxiway and apron areas also require marking. Yellow centerline stripes are currently painted on all taxiway surfaces at the airport to provide this guidance to pilots. The apron areas have centerline markings to indicate the alignment of taxilanes within these areas. Besides routine maintenance of the taxiway striping, these markings will be sufficient through the planning period.

Holding position markings should be located on all taxiways that intersect runways. At airports without airport traffic control towers, these runway markings identify the location where a pilot should assure there is adequate separation with other aircraft before proceeding onto the runway. The existing hold lines meet the current standard, which is 200 feet from the runway centerline.

Airport lighting systems provide critical guidance to pilots during nighttime and low-visibility operations. Both runways are currently equipped with medium intensity runway lighting (MIRL). This will be sufficient through the planning period.

Effective ground movement of aircraft at night is enhanced by the availability of taxiway lighting. Presently, a portion of the taxiway system at Tillamook Airport is served by reflectors. Consideration should be given to the installation of medium intensity taxiway lighting (MITL).

Airfield signage provides another means of notifying pilots as to their location on the airport. A system of signs placed at several airfield intersections on the airport is the best method available to provide this guidance. Limited signage exists at Tillamook Airport. The airport should consider installing upgraded directional signs.

NAVIGATIONAL APPROACH AIDS

There is currently one published instrument approach to Tillamook Airport: RNAV (GPS) Runway 13. Utilizing this approach, a properly equipped aircraft can land at the airport with 800-foot cloud ceilings and one mile visibility for aircraft in approach categories A and B. Visibility increases for aircraft in approach category C. This GPS approach can also be utilized as a circling approach. The Port should continue to monitor the potential for upgrading (lowering minimums) for the approach to Runway 13. Runway 1-19 is a visual-only runway and does not currently support instrument approach capability.

To provide pilots with visual guidance information during landings to the runway, electronic visual approach aids are commonly provided at airports. Currently, there is a two-light precision approach path indicator (PAPI-2L) on both ends of Runway 13-31 and Runway 1-19. Upgrading to a four-light PAPI on Runway 13 should be considered if the airport begins to serve larger numbers of jets.

Runway End Identification Lights (REILs) provide the pilot with rapid and positive identification of the runway end. They consist of a set of synchronized flashing lights located laterally on each side of the runway centerline at the runway end. REILs should be planned for both ends of Runway 13-31.

WEATHER REPORTING FACILITIES

The airport is equipped with a lighted wind cone, which provides pilots with information about wind conditions, and a segmented circle, which provides pilots with traffic information. These facilities are required when the airport is not served by a 24-hour control tower. The airport is also equipped with an Automated Weather Observation System (AWOS-3). The AWOS automatically records weather conditions such as wind speed, gusts, wind direction, temperature, dew point, altimeter setting, and density altitude. In addition, the AWOS-3 records visibility, precipitation, and cloud height. These facilities are sufficient and should be maintained in the future.

LANDSIDE REQUIREMENTS

Landside facilities are those necessary for the handling of aircraft and passengers while on the ground. These facilities provide the essential interface between the air and ground transportation modes. The capacities of the various components of each area were examined in relation to projected demand to identify future landside facility needs. This includes the general aviation terminal building and automobile parking, aircraft hangars, and aircraft apron area.

ADMINISTRATION BUILDING

General aviation terminal facilities have several functions. Space is required for a pilots' lounge, flight planning, concessions, management, storage, and various other needs. This space is not necessarily limited to a single, separate terminal building, but can include space offered by FBOs for these functions and services.

The existing administration building at Tillamook Airport is located near the aircraft parking apron and self-serve fueling facility. This building totals approximately 576 square feet and provides a pilot lounge, weather reporting, restrooms, and telephones. Limited automobile parking is provided, adjacent to the administration building.

The methodology used in estimating general aviation terminal facility needs is based on the number of airport users expected to utilize general aviation facilities during the design hour. General aviation space requirements were based upon providing 120 square feet per design hour itinerant passenger. Design hour itinerant passengers are determined by multiplying design hour itinerant operations by the number of passengers on the aircraft (multiplier). An increasing passenger count is used to account for the likely increase in larger, more sophisticated aircraft using the airport.

As shown in **Table V**, additional area could be supported through the planning period. Future needs could be met with the development of a new facility or expansion of the existing facility. A portion of the space requirements may also be met in an FBO. The alternatives analysis will examine this in more detail in the following chapter.

TABLE V
Administration Building
Tillamook Airport

	Currently Available	Short Term Need	Intermediate Term Need	Long Term Need
General Aviation Design Hour Itinerant Passengers	19	26	35	54
General Aviation Building Space (s.f.)	576	3,100	4,100	6,500

AUTOMOBILE PARKING

Currently, limited automobile parking is available at Tillamook Airport. Future parking demands have been determined based on an evaluation of the existing airport use, as well as industry standards, which consider one-half of based aircraft at the airport will require a parking space. **Table W** presents future vehicle parking requirements for the airport.

TABLE W
Vehicle Parking Requirements
Tillamook Airport

		Future Requirements		
	Currently Available	Short Term Need	Intermediate Term Need	Long Term Need
Design Hour Passengers		10	12	17
Terminal Vehicle Spaces Parking Area (s.f.)		18 7,200	25 10,000	42 16,800
General Aviation Spaces Parking Area (s.f.)		25 10,000	28 11,200	35 14,000
Total Parking Spaces **Total Parking Area (s.f.)**	**N/A***	**43** **17,200**	**53** **21,200**	**77** **30,800**

*Limited automobile parking currently available at administration building; no parking is available next to storage hangars.

AIRCRAFT STORAGE HANGARS

Utilization of hangar space varies as a function of local climate, security, and owner preferences. The trend in general aviation aircraft, whether single or multi-engine, is towards more sophisticated aircraft (and, consequently, more expensive aircraft); therefore, many aircraft owners prefer enclosed hangar space to outside tie-downs.

The demand for aircraft storage hangars is dependent upon the number and type of aircraft expected to be based at the airport in the future. For planning purposes, it is necessary to estimate hangar requirements based upon forecast operational activity. However, hangar development should be based upon actual demand trends and financial investment conditions. While a majority of aircraft owners prefer enclosed aircraft storage, a number of based aircraft will still tie-down outside (due to the lack of hangar availability, hangar rental rates, and/or operational needs). Therefore, enclosed hangar facilities should not be planned for each based aircraft. At Tillamook Airport, approximately 90 percent of the based aircraft are currently stored in enclosed hangar facilities. It is estimated that this percentage will remain constant through the planning period.

Hangars are typically classified as either T-Hangars (individual spaces within a larger contiguous structure that allow privacy and individual access to their space) or executive/conventional hangars (small to very large units which accommodate multiple aircraft).

Hangar storage facilities at Tillamook Airport (on-airport) are made up entirely of T-hangars. Approximately 92 percent of the hangared aircraft at Tillamook Airport are currently stored in T-hangars. The majority of aircraft currently stored in these hangars are single-engine. A planning standard of 1,200 square feet per based aircraft has been used to determine future requirements.

The remaining eight percent of hangared aircraft are stored in conventional/executive hangars (off airport property), which are designed for multiple aircraft storage. As the trend to-wards more sophisticated single and multi-engine aircraft continues throughout the planning period, it is important to determine the need for more conventional/executive hangars. For executive/conventional hangars, a planning standard of 1,200 square feet was used for single-engine aircraft, while a planning standard of 3,000 square feet was used for multi-engine, jet, and helicopters. These planning standards recognize that some of the larger business jets require a greater amount of space.

Since portions of conventional/executive hangars are also used for aircraft maintenance and servicing, requirements for maintenance/service hangar area were estimated using a planning standard of approximately 15 percent of the total hangar space needs.

Future hangar requirements for the airport are summarized in **Table X**. As shown on the exhibit, additional hangar area could be supported in the long term. It should be noted that these hangar requirements are general in nature based on the aviation demand forecasts. Actual need for hangar space will depend on the actual usage within hangars. The recommended development concept will examine the options available for hangar development at the airport and determine the best location for each type of hangar facility.

TABLE X Aircraft Storage Requirements Tillamook Airport		Future Requirements		
	Currently Available	Short Term Need	Intermediate Term Need	Long Term Need
Aircraft to be Hangared	40	45	50	63
T-Hangar Positions	37	39	42	50
Executive/Conventional Hangar Positions	3	6	8	13
T-Hangar Area	60,000	46,800	50,400	60,000
Executive/Conventional Hangar Area	12,800	18,000	22,200	33,600
Maintenance Area	N/A	9,500	10,900	14,000
Total Hangar Area (s.f.)	**72,800**	**74,300**	**83,500**	**107,600**

AIRCRAFT PARKING APRON

A parking apron should provide for the number of locally based aircraft that are not stored in hangars, as well as for those aircraft used for air taxi and training activity. Parking should be provided for itinerant aircraft as well. As previously mentioned, approximately 90 percent of based aircraft at Tillamook Airport are currently stored in hangars, and that percentage is expected to remain constant through the planning period.

For planning purposes, 20 percent of the based aircraft total will be used to determine the parking apron requirements of local aircraft, due to some aircraft requiring both hangar storage and parking apron space. Since the majority of locally based aircraft are stored in hangars, the area requirement for parking of locally based aircraft is smaller than for transient aircraft. Therefore, a planning criterion of 650 square yards per aircraft was used to determine the apron requirements for local aircraft.

Transient aircraft parking needs must also be considered when determining apron requirements. Current apron area totals approximately 7,000 square yards, with capacity for 12 aircraft. A planning criterion of 800 square yards was used for single and multi-engine itinerant aircraft and 1,600 square yards for itinerant jets. Total aircraft parking apron requirements are presented in **Table Y**. According to these recommendations, additional apron will be needed in the short term.

In addition to transient and local parking positions, two parking positions should be provided for air cargo aircraft. Each position should use the planning standard of 800 square yards per single or twin-engine aircraft which are commonly used in cargo transport.

TABLE Y General Aviation Aircraft Parking Apron Requirements Tillamook Airport				
		Future Requirements		
	Currently Available	Short Term Need	Intermediate Term Need	Long Term Need
Single, Multi-Engine Transient Aircraft Positions		8	8	11
Apron Area (s.y.)		6,400	6,400	8,800
Transient Jet Aircraft Positions		2	2	3
Apron Area (s.y.)		3,200	3,200	4,800
Locally-Based Aircraft Positions		8	9	11
Apron Area (s.y.)		5,200	5,900	7,200
Total Positions	**12**	**18**	**19**	**25**
Total Apron Area (s.y.)	**7,000**	**14,800**	**15,500**	**20,800**

FACILITY REQUIREMENTS SUMMARY

The intent of this section has been to outline the facilities required to meet potential aviation demands projected for Tillamook Airport for the planning horizon. **Exhibit L** presents a summary of the landside facility requirements. The next step is to determine a direction of development which best meets these projected needs through a recommended development concept. The remainder of this report will be devoted to outlining this direction, its schedule, and its costs.

AIRPORT DEVELOPMENT ALTERNATIVES

In the previous section, airside and landside facility needs that would satisfy projected demand over the planning period were identified. The next step in the planning process is to evaluate the various ways these facilities can be provided. In this section, the facility needs will be applied to a series of airport development alternatives. The possible combination of alternatives can be endless, so some intuitive judgment must be applied to identify the alternatives which have the greatest potential for implementation. The alternatives analysis is an important step in the planning process since it provides the underlying rationale for the final recommendations.

The alternatives presented in this chapter provide a series of options for meeting short and long-range facility needs. Since the levels of general aviation activity can vary from forecast levels, flexibility must be considered in the plan. If activity levels vary significantly within a five-year period, the Port of Tillamook Bay should consider updating the plan to reflect the changing conditions.

Since the budgeted time for alternative evaluation is limited, only the more prudent and feasible alternatives were examined. The alternatives presented in this chapter will be reviewed with the Port of Tillamook Bay to allow for further refinement.

Following reviews by the Port and the local advisory committee, and follow-ing preparation of an updated airport layout plan (ALP) drawing, a final program will be developed. However, a final decision with regard to pursuing a particular development plan which meets the needs of general aviation users rests exclusively with the Port of Tillamook Bay.

BACKGROUND

Prior to presenting airport development alternatives, it is helpful to review some of the previous airport planning efforts and the development that has occurred during the intervening years. Recounting recent (or ongoing) airfield improvements will assist with the identification of current issues affecting future development options. Improvements made at Tillamook Airport over the past few years include the following projects:

- Pavement rehabilitation and new marking
- New perimeter fencing.
- New automated weather equipment.
- Updated fuel facilities
- New beacon location.

The previous ALP depicted additional hangars on the north side of the airfield (using one of the former blimp pads), a new terminal on the north side (facing Runway 13-31), a new freight terminal (east of the storage hangars), and new storage hangars next to the parking ramp on the west side of the airfield. No changes were noted to runways or taxiways on the airfield. While no revisions to the airport property line were noted, several areas on the airport property were noted for possible non-aviation related development, including a golf course (no longer under consideration) and a recreational vehicle park (currently in place on the west side).

INITIAL DEVELOPMENT CONSIDERATIONS

Upon completion of the facility needs evaluation, a number of airport development considerations were outlined. These considerations, which have been grouped into airside and landside categories, have been summarized on the following exhibits.

While many of these development considerations are demand driven, several are included to improve airfield safety or efficiency of the airfield system, or to meet current design standards. Each of the items is important considerations in the planning process.

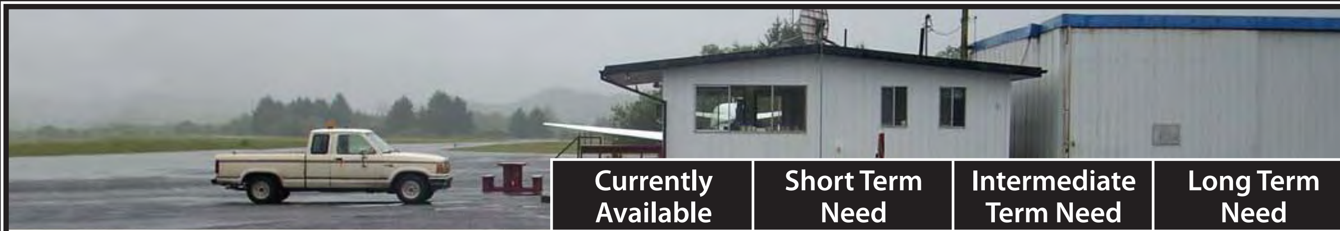
CONSIDERATION OF NON DEVELOPMENT ALTERNATIVES

NO ACTION ALTERNATIVE

In analyzing and comparing costs and benefits of various development alternatives, it is important to consider the consequences of no further development. The “no action” alternative essentially considers keeping the airfield in its present condition, and not providing for any improvements to existing facilities. The primary result of this alternative, as in any changing air transportation market, would be the eventual inability of the airport to satisfy the increasing demands of the local service area.

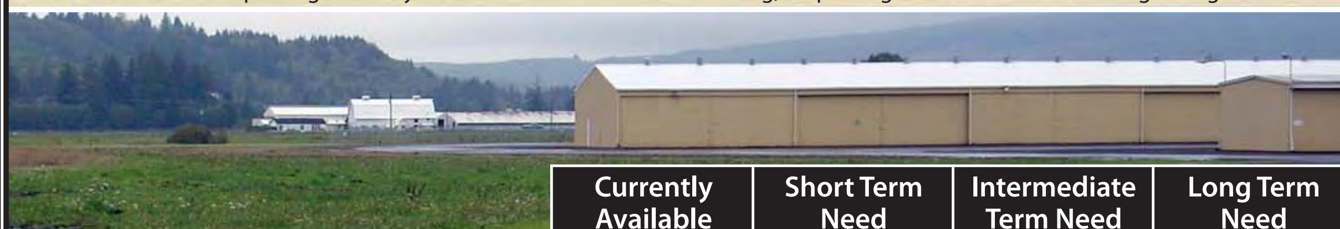
The airport’s aviation forecasts and the analysis of facility requirements indicated a need for additional hangar facilities and apron area. Without these improvements to the airport facilities, regular users of the airport would be constrained.

10MP10-L-11/22/10

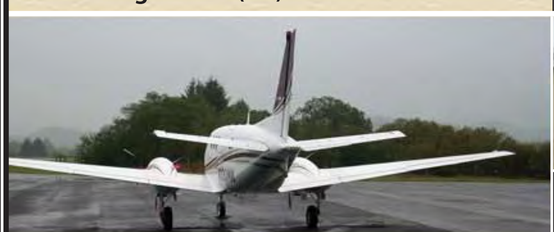


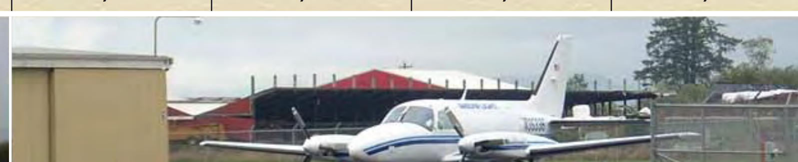
	Currently Available	Short Term Need	Intermediate Term Need	Long Term Need
General Aviation Administration Building Area (s.f.)				
G.A. Administration Building Area Space (s.f.)	576	3,100	4,100	6,500
Vehicle Parking Requirements				
Design Hour Passengers		10	12	17
Terminal Vehicle Spaces Parking Area (s.f.)		18 7,200	25 10,000	42 16,800
General Aviation Spaces Parking Area (s.f.)		25 10,000	28 11,200	35 14,000
Total Parking Spaces **Total Parking Area (s.f.)**	N/A*	**43** **17,200**	**53** **21,200**	**77** **30,800**

* Limited automobile parking currently available at administration building; no parking is available next to storage hangars.



	Currently Available	Short Term Need	Intermediate Term Need	Long Term Need
Aircraft Storage Requirements				
Aircraft to be Hangared	40	45	50	63
T-Hangar Positions Executive/Conventional Hangar Positions	37 3	39 6	42 8	50 13
T-Hangar Area (s.f.) Executive/Conventional Hangar Area (s.f.) Maintenance Area	60,000 12,800 N/A	46,800 18,000 9,500	50,400 22,200 10,900	60,000 33,600 14,000
Total Hangar Area (s.f.)	**72,800**	**74,300**	**83,500**	**107,600**





	Currently Available	Short Term Need	Intermediate Term Need	Long Term Need
General Aviation Aircraft Parking Requirements				
Single, Multi-Engine Transient Aircraft Positions Apron Area (s.y.)		8 6,400	8 6,400	11 8,800
Transient Jet Aircraft Positions Apron Area (s.y.)		2 3,200	2 3,200	3 4,800
Locally-Based Aircraft Positions Apron Area (s.y.)		8 5,200	9 5,900	11 7,200
Total Positions **Total Apron Area (s.y.)**	**12** **7,000**	**18** **14,800**	**19** **15,500**	**25** **20,800**

Exhibit L
LANDSIDE FACILITY REQUIREMENTS

The ramifications of the "no action" alternative extend into impacts on the economic well-being of the region. If facilities are not maintained and improved so that the airport maintains a pleasant experience to the visitor or business traveler, then these individuals may consider alternate locations.

Thus, the "no action" alternative is inconsistent with the long term transportation goals of the Port of Tillamook Bay, which is to enhance local and interstate commerce. A policy of "no action" would be considered an irresponsible approach, affecting not only the long term viability of the airport and the investment that has been made in it, but also the economic growth and development of the airport's service area. Therefore, the "no action" alternative was not considered as prudent or feasible.

TRANSFER SERVICES TO ANOTHER AIRPORT

Limiting development at Tillamook Airport and relying on other airports to serve aviation demand for the local area was also considered. As discussed in the inventory section, several public-use general aviation airports are located within a 40-mile radius of Tillamook Airport. However, with the exception of Portland-Hillsboro Airport (37 miles) and McMinnville Municipal Airport (32 miles), each offer limited services. In fact, the two other public-use airports in Tillamook County -- Pacific City and Nehalem Bay (both state-owned airports) -- provide very limited runway lengths (1,875 and 2,350 feet).

Growth in new businesses will continue to create a need for local access to the air transportation system. While the role of the airport is expected to continue as a general aviation facility, services for multi-engine and turbine aircraft are very limited in Tillamook County, and Tillamook Airport is providing unique services to these aircraft.

DEVELOPMENT OF A NEW AIRPORT

The alternative of developing an entirely new airport facility to meet the aviation needs of the local area can also be considered when an airport reaches capacity and it is cost-prohibitive to expand the existing facility. However, development of a new airport is not considered necessary at this time, as Tillamook Airport can continue to develop and upgrade to serve increasing demands by new technology aircraft.

AIRSIDE CONSIDERATIONS

Airside facilities are, by their very nature, a focal point of the airport complex. Because of their role, and the fact that they physically dominate a great deal of the airport's property, airside facility needs are often the most critical factor in the determination of viable airport development alternatives. In particular, the runway system requires the greatest influence on the identification and development of other airport facilities. Furthermore, due to the number of aircraft operations, there are a number of FAA design criteria that must be considered when looking at airside improvements.

Exhibit M has identified a number of airside considerations. The runway lengths are adequate to serve the majority of aircraft in the general aviation fleet. The current configuration, based upon wind summaries organized for the most immediate multi-year period, exceed FAA's 95 percent coverage requirement. A possible consideration in the plan is to upgrade the status of Runway 1-19 to ARC B-II, since the current designated design category restricts its use exclusively to small aircraft. This will have no impact on the runway width since it is already maintained at 75 feet. Future taxiways serving the runway will need to be maintained at 35 feet in width, and parallel taxiways will need to be separated from the runway by 240 feet (it is noted that the runway-taxiway separation on Runway 13-31 is 300 feet). A larger runway protection zone is required if operations are not limited exclusively to small aircraft. Since the Runway 19 threshold is displaced (but not due to an obstruction in the approach or limited safety area), additional length is available to meet the requirements of a greater percentage of the general aviation fleet.

While the airfield is reasonably well served by taxiways, several improvements should be considered, as noted on **Exhibit M**. The angled exit taxiway on the west side should be relocated and rebuilt as a right-angled exit. The crossing taxiway at the threshold of Runway 1 should be reconfigured to provide a right-angled entrance/exit at the runway end. This will create the need to shift the runway threshold to the northeast; however, the threshold on Runway 19 can be relocated approximately 500 feet to the cross-taxiway and eliminate a taxiway entrance onto Runway 19. The reconfiguration of the taxiway between the Runway 1 threshold and Runway 13-31 will also provide the opportunity to provide an additional exit along Runway 13-31.

During the interim study coordination meeting with the advisory committee, runup (holding) aprons were noted as a need on each end of Runway 13-31. A hold area (or bypass) should also be provided at the 13 end for aircraft originating from the hangar area. Interior exits between the two runways leading to the former blimp pads appear to offer well-spaced and efficient locations for taxiing into hangar storage and air cargo areas. However, along the east side of the airfield, no taxiway currently exists. While activity is primarily limited to aircraft moving to and from the Air Museum, the lack of a taxiway in this area contributes to back-taxiing on the two runways. Therefore, additional taxiways have been noted on the exhibit to improve aircraft safety and to reduce the incidence of back-taxiing. Hold lines should be added on existing pavements adjacent to Runway 31. The blimp pad on the infield area continues to be used for balloon launches and should be maintained.

Potential improvements on the airfield for marking, navaids, and lighting include the addition of runway end identification lights for Runway 13-31, medium intensity taxiway lights for all taxiways, directional signs for all areas on the airfield, and a potential upgrade to the precision approach path indicator (PAPI) on Runway 13 if the number of turbine aircraft increase in the future.

LANDSIDE CONSIDERATIONS

Several new facilities are being considered by the Port of Tillamook Bay for the airport, including a new terminal/fixed base operation building, storage hangars, 10MP07-M-02/24/11

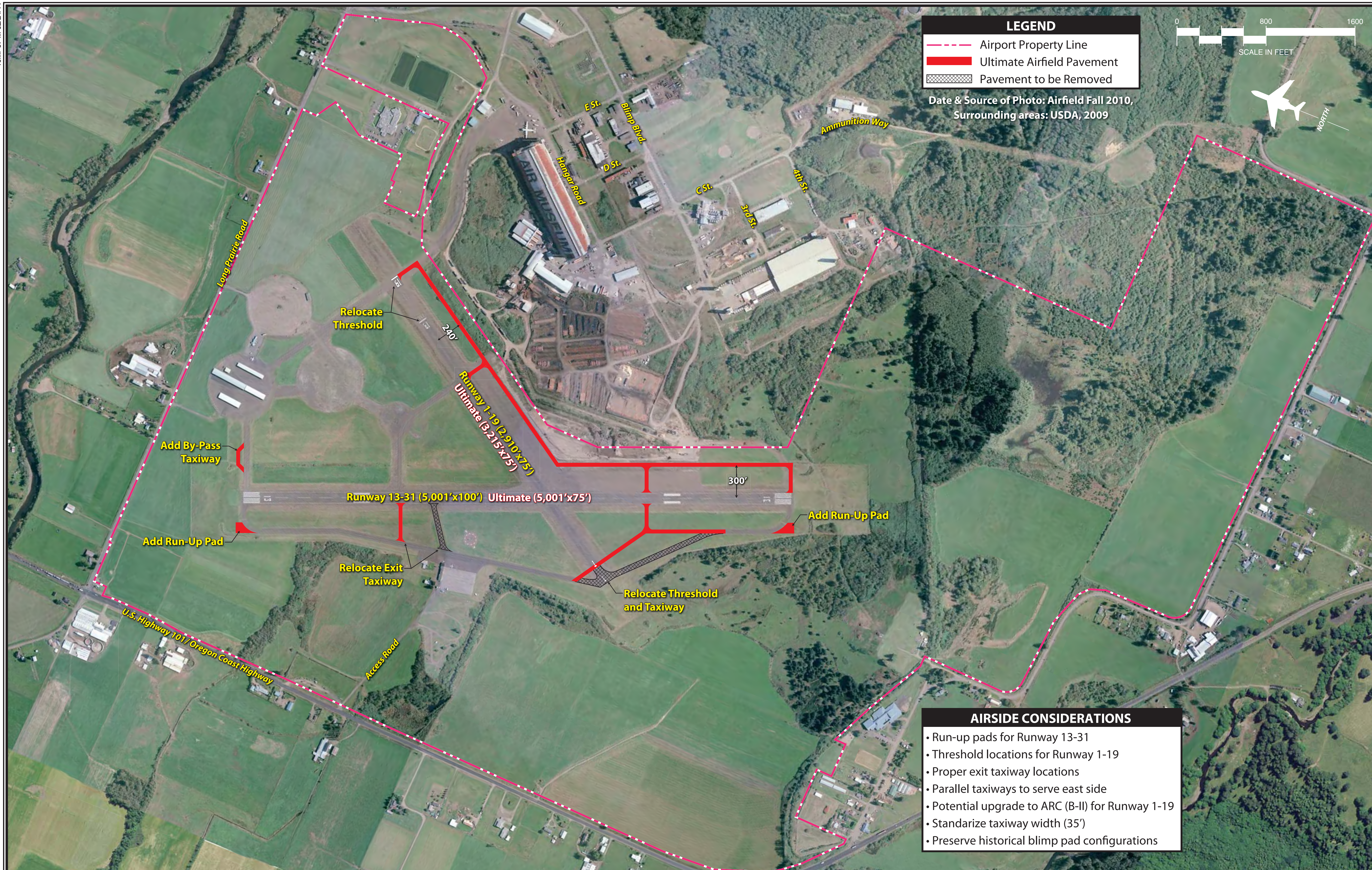


Exhibit M
AIRSIDE DEVELOPMENT CONSIDERATIONS

and several buildings in a business park. A new 2,500-square foot terminal and several new storage hangars will be located on the west side of the airport, since additional construction of hangars on blimp pads or in flood prone areas on the north side of the airport are to be discouraged. The parking lot next to the terminal building will need to be enlarged to meet future demands.

The area north and west of the ramp and south of the entrance road is being considered for the first phase of hangars, while additional phases can be added west of the ramp or on property north of the access road. The area west of the fuel storage tanks and beacon provide an excellent location for future hangar development. Alternative configurations have been depicted on **Exhibit N**, including a possible mix of conventional and nested "T" hangars. Storage hangars are normally constructed in small numbers, based upon need and financing capability. Most aircraft currently based on the airfield are stored in hangars, and aircraft basing at the airport in the future are expected to need similar storage facilities. The sizing of hangars (which range from 2,500 to 5,000 square feet per unit) will need to be responsive to demand; however, the layouts as proposed on the exhibit have flexibility in meeting varying size requirements. The layouts as depicted generally provide a minimum of 75 feet of separation (between facing hangars) to provide efficient aircraft taxiing between hangars.

The existing hangars on the north side have been subject to flooding in recent years, and the positioning of the buildings contributes to the line-of-sight difficulties on the taxilane. Approximately half of the existing units may be approaching the end of their useful life and require replacement. Therefore, consideration should be given to gradually replacing these hangars with newer storage hangars on the west side.

Aircraft parking for air cargo is limited on the edge of the blimp pad. A dedicated ramp that can accommodate two parking positions for aircraft similar in size to the Piper Chieftain or Cessna Caravan should be provided.

The Port of Tillamook Bay has examined layouts for the business park which will complement the taxiway and ramp available in the area and the air cargo capabilities. Final layouts will be depicted on the airport layout plan drawings in this study.

LAND RELEASE CONSIDERATIONS

Federal law obligates an airport sponsor to use all property shown on an ALP or property map for public airport purposes. A distinction is generally not made between property acquired locally and property acquired with federal assistance. However, property acquired with federal assistance or transferred as surplus property from the federal government may have specific covenants or restrictions on its use which may differ from property acquired locally.

These obligations will require that the Port of Tillamook Bay formally request from the FAA a release from the terms, conditions, reservations, and restrictions contained in any conveyance deeds and assurances in previous grant agreements. A release is required even if the airport desires to continue to own the land and only lease the land for development. The obligations relate to the use of the land just as much as they do to the ownership of the land.

U.S. Code-Section 47153 authorizes the FAA to release airport land when it is convincingly clear that:

- Airport property no longer serves the purpose for which it was conveyed. In other words, the airport does not need the land now or in the future because it has no airport-related or aeronautical use, nor does it serve as approach protection, a compatible land use, or a noise buffer zone.
- The release will not prevent the airport from carrying out the purpose for which the land was conveyed. In other words, the airport will not experience any negative impacts from relinquishing the land.
- The release is actually necessary to advance the civil aviation interests of the counters. In other words, there is a measurable and tangible benefit for the airport.

Several steps are required to gather the necessary information and justification for the release:

- Inventory Existing Lands
- Identify Land Needed for Aviation Purposes
- Identify Land Available for Release
- Prepare Land Release Request

INVENTORY EXISTING LANDS

An important component of the overall release process is the identification of the instruments of disposal by which the airport land was conveyed to the Port of Tillamook Bay. Two properties have been identified on **Exhibit P** as surplus to future aviation-related or aeronautical use. Parcel A (32.3 acres) falls outside of aviation-related or approach/departure areas. Parcel B (15.15 acres) has been designated as a potential aviation museum site.

Future airport-related development area is located on the north and west sides of airport property, with expansion potential well beyond the 20-year planning period. These properties were transferred by quitclaim deed from the U.S. government to Tillamook County in 1964, and transferred to the Port of Tillamook Bay in 1967.

One parcel has been identified for transfer from Port of Tillamook Bay to airport property: Parcel C (31.91 acres). This property has the potential for aviation-related development and should be included within designated airport property.

The identification of any environmental constraints is also important. While FAA Order 1050.1E, *Environmental Policies and Procedures*, states that a release of an airport sponsor from federal obligations is normally categorically excluded and would not normally require an Environmental Assessment, the issuance of a categorical exclusion is not automatic and the FAA must determine that no extraordinary circumstances exist at the airport. An inventory of environmental conditions on airport property would assist the FAA in making this decision.

IDENTIFY LAND NEEDED FOR AVIATION PURPOSES

Ultimately, the ability of the Port of Tillamook Bay to use airport property for non-aeronautical revenue production will rest upon a determination by the FAA that portions of the airport property are no

10MP07-N-02/24/11

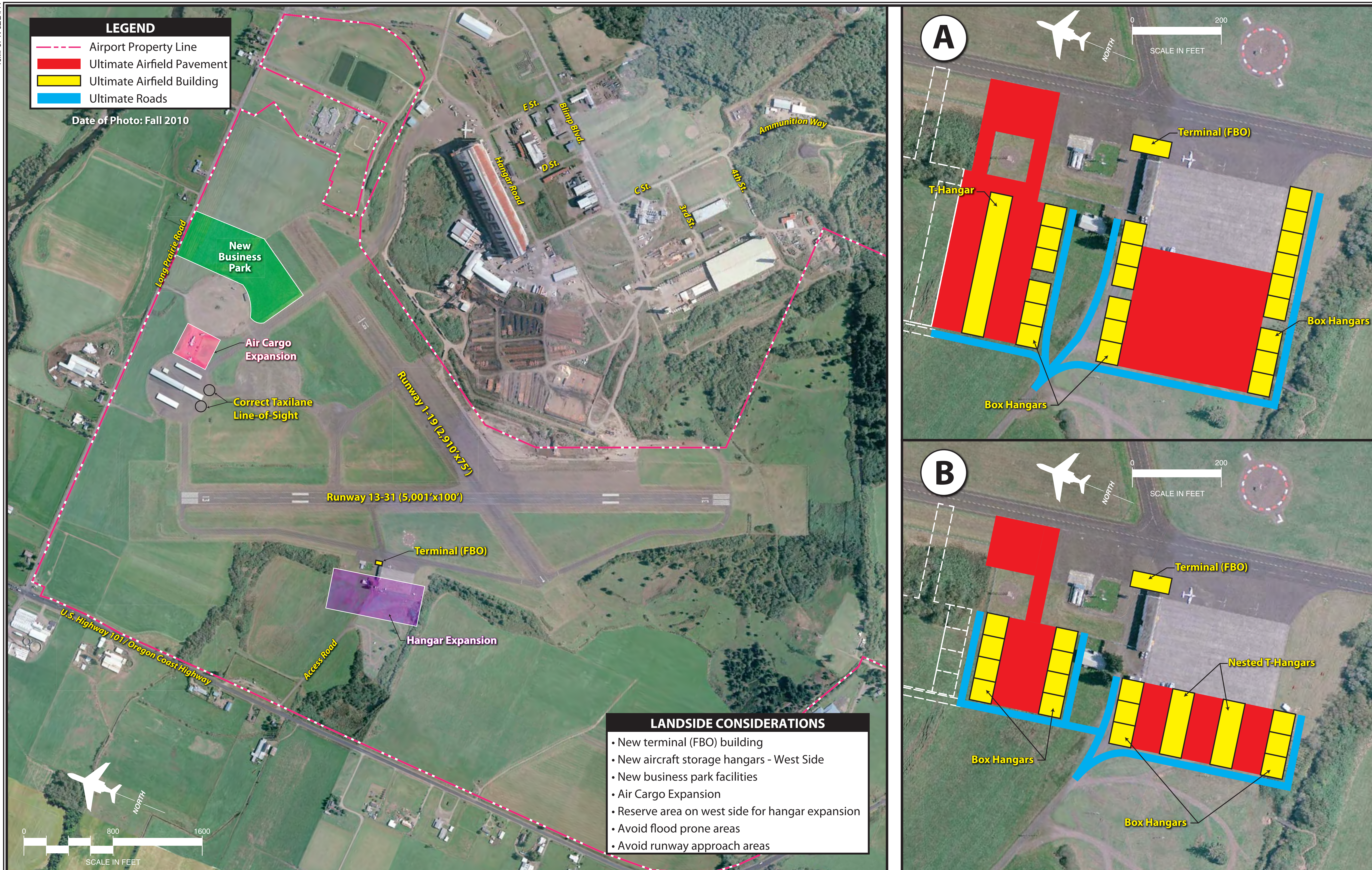


Exhibit N
LANDSIDE DEVELOPMENT CONSIDERATIONS

10MP07-P-02/24/11

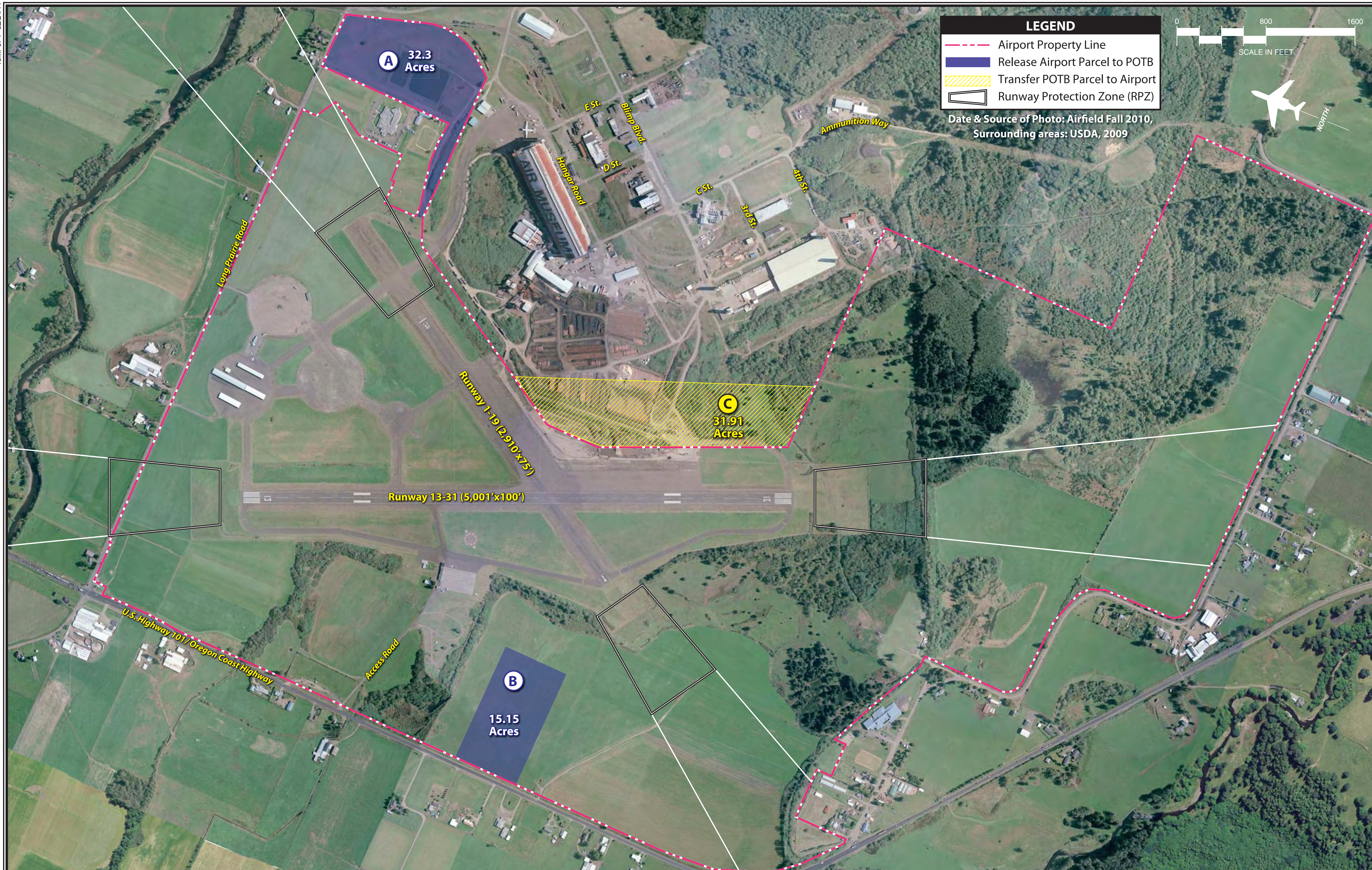


Exhibit P
LAND RELEASE AND
TRANSFER CONSIDERATIONS

longer needed for airport-related or aeronautical uses. To prove that land is not needed for aeronautical purposes, an assessment and determination of the area that will be required for aeronautical purposes is required. The current ALP process is examining potential aeronautical needs of the airport property over the next 20 years, and will serve to assist with this requirement.

IDENTIFY LAND AVAILABLE FOR RELEASE

Using the results of the preceding analysis, a determination of land available for release has to be made. The two parcels on **Exhibit P** have been identified for preliminary consideration. The preliminary analysis has evaluated any constraints that may be put on the use of the land in the future, such as height restrictions to comply with 14 CFR Part 77, *Objects Affecting Navigable Airspace, Terminal Instrument Procedures (TERPS)*, and compatible land use. Approach/departure corridors have been excluded from consideration for release. Because of rising terrain on the south side of the airport, this corridor has been extended to the property line.

PREPARE LAND RELEASE REQUEST

A formal land release request will need to be prepared by the Port of Tillamook Bay and submitted to the FAA. The following elements will need to be included in the request:

- A description of the obligating conveyance instrument or grant.
- A complete property description, including a legal description of the land to be released.
- A description of the property condition.
- A description of federal obligations.
- The kind of release requested.
- The purpose of the release.
- Justification for the release.
- The disposition and market value of the released land.
- A reinvestment agreement (commitment by the Port to reinvest any lease or sale revenues exclusively for the improvement, operation, and maintenance of the Port's aviation facilities.
- Draft instrument of release.
- Environmental documentation (may be categorically excluded or require a more detailed Environment Assessment).

Once approved by FAA staff, a release will need to be published in the Federal Register for 30 days before a final determination is made and the release granted.

RECOMMENDED DEVELOPMENT CONCEPT

The recommended development concept has been depicted on **Exhibit Q**. The previous assessment of facility needs has identified airside and landside projects which need to be included in the Port's next capital program for the airport. These projects are intended to work in conjunction with other projects currently proposed for the airport by the Port of Tillamook Bay, including a new terminal/fixed base operation building, aircraft storage hangars, and several buildings in the business park. The final concepts included in this document and displayed on the new airport layout plan drawings will supplement the current proposals. The improvements included in this planning document have been summarized as follows:

- Add run-up pads on each end of Runway 13-31.
- Relocate exit taxiway on Runway 13-31 at terminal apron.
- Remove older hangars (north side) and construct replacement hangars on the west side.
- Widen all taxiways on airfield to a minimum of 35 feet.
- Relocate Runway 1 threshold (northeast) by approximately 150 feet, with connecting taxiways, and straighten portion of parallel taxiway.
- Relocate Runway 19 threshold by approximately 450 feet, increasing available runway length on the runway by approximately 300 feet.
- Add additional exit taxiway on Runway 13-31 at 1,300 feet from the Runway 31 threshold.
- Add parallel taxiway on east side of airfield.
- Provide phased development of hangars and apron on the west side.
- Consider release of two parcels (totaling 47.45 acres) from airport related or aeronautical obligations. One parcel (32.3 acres) would be released to POTB, while a 15.15-acre parcel would be sold for an aviation museum. A parcel on the east side (31.91 acres) would be returned to the airport from POTB.

DEVELOPMENT SCHEDULE

Now that the recommended concept has been developed and specific needs and improvements for the airport have been established, the next step is to determine a realistic schedule (implementation timeline) and the associated costs for the plan. This section will examine the overall cost of each project identified in the airport capital improvement program (ACIP) and present a development schedule. The recommended improvements are grouped by planning horizon: short term, intermediate term, and long term. The short term planning horizon is further subdivided into yearly increments. **Table Z** summarizes key activity milestones for the three planning horizons.

A key aspect of this planning document is the use of demand-based planning milestones. Many projects should be considered based on actual demand levels within the next five years. As short term horizon activity levels are reached, it will then be time to program for the intermediate term based upon the next activity milestones. Similarly, when the intermediate term milestones are reached, it will be time to program for the long term activity milestones.

Many development items included in the recommended concept will need to follow these demand indicators. For example, the plan includes construction of new aircraft storage hangars and taxilanes. Based aircraft will be the primary indicator for these projects. If based aircraft growth occurs as projected, additional hangars should be constructed to meet the demand. Often this potential growth is tracked with a hangar waiting list.

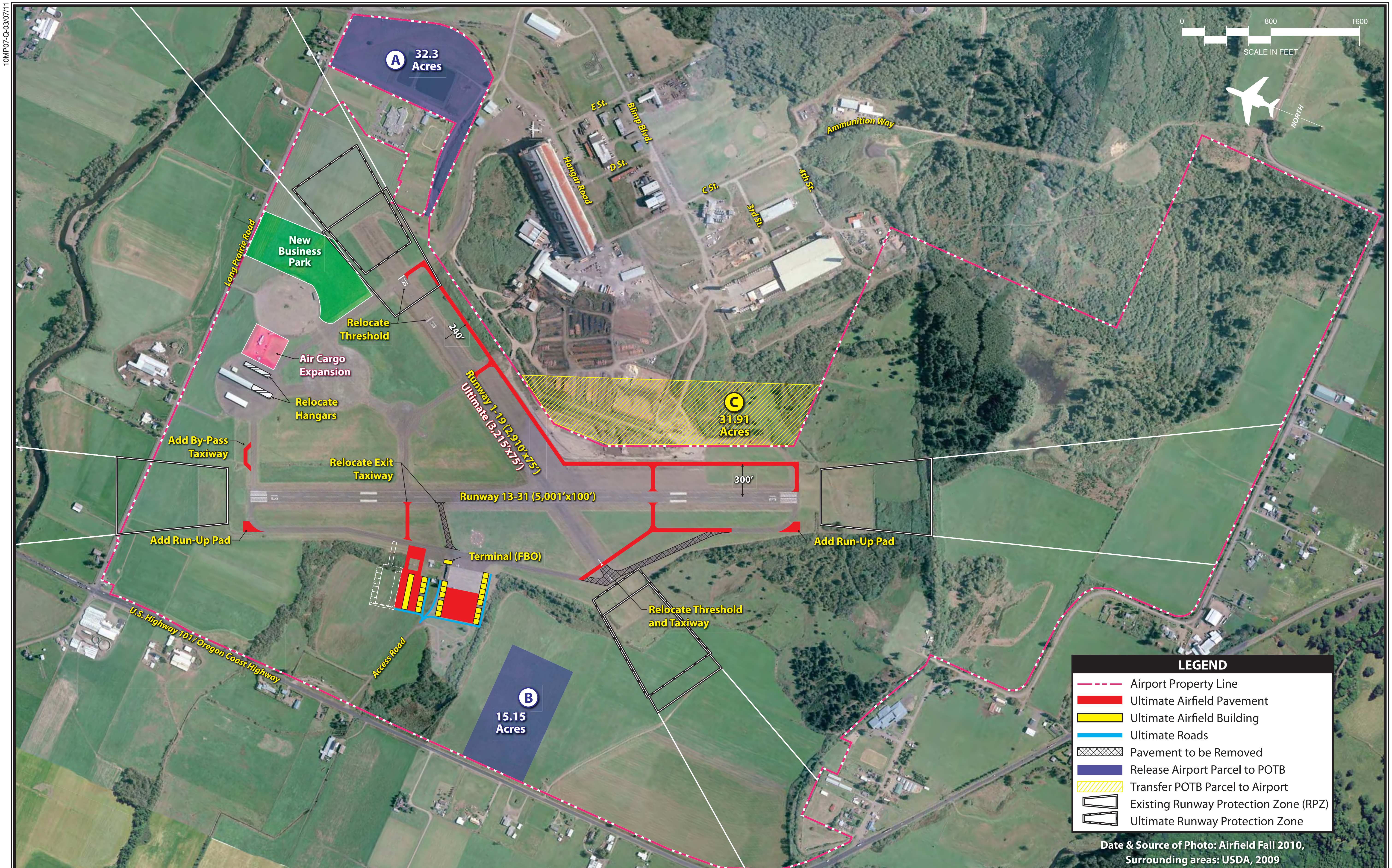


Exhibit Q
AIRPORT DEVELOPMENT CONCEPT

TABLE Z Planning Horizon Summary Tillamook Airport	Base Year (2010)	Short Term	Intermediate Term	Long Term
Based Aircraft	44	50	55	65
ANNUAL OPERATIONS				
General Aviation				
Itinerant	6,500	7,400	8,200	9,700
Local	1,200	1,300	1,400	1,700
Subtotal	7,700	8,700	9,600	11,400
Air Taxi Activity				
Itinerant	700	900	1,000	1,100
Military Activity				
Itinerant	100	100	100	100
TOTAL OPERATIONS	**9,000**	**10,200**	**11,200**	**13,100**
Source: Coffman Associates				

If growth slows or does not occur as forecast, some projects may be delayed. As a result, capital expenditures will be made on an as-needed basis, which leads to a more responsible use of capital assets.

Some development items do not depend on demand, such as meeting design standards for runway safety area (RSA). Safety related projects should be programmed in a timely manner regardless of the forecast growth in activity. Other items, such as pavement maintenance, should be addressed in a scheduled manner and are not dependent on reaching aviation demand milestones. These types of projects typically are more associated with day-to-day operations.

As an ALP planning document is a conceptual document, implementation of the capital projects should only be undertaken after further refinement of their design and costs through architectural and engineering analyses. Moreover, some projects may require additional infrastructure improvements (i.e., drainage improvements, extension of utilities, etc.), that may take more than one year to complete.

Once the list of necessary projects was identified and refined, project specific cost estimates were developed. The cost estimates include design, engineering, construction administration, and contingencies that may arise on the project. Capital costs should be viewed only as estimates subject to further refinement during design. Nevertheless, the estimates are considered sufficient for planning purposes. The development program and costs has been attached in **Appendix B**. Cost estimates for each of the development projects in the ACIP are in current dollars.

AIRPORT CAPITAL IMPROVEMENT PROGRAM

While the FAA requires the airport to submit a five-year airport capital improvement program (ACIP) each year, the planning effort affords the opportunity to examine projects (and their potential financing) beyond the short term planning horizon. Several factors may influence the timing of projects in the intermediate and long term planning periods. Therefore, greater flexibility must be considered with regard to their implementation. The timing for capacity-related projects will need to be based upon activity levels (e.g., annual operations or based aircraft) and the types of aircraft using the facility. Other projects may focus on the need to improve airport security, terminal or airfield efficiencies, or to rehabilitate pavements or structures on the airport. Consequently, this planning document must remain flexible to unforeseen changes which may occur over time.

Financing capital improvements at the airport will not rely solely on the financial resources of the Port of Tillamook Bay. Capital improvement funding is available through various grant-in-aid programs on both the state and federal levels. Historically, Tillamook Airport has received federal and state grants. While more funds may be available in some years, the ACIP was developed with project phasing in order to remain realistic and within the range of anticipated grant assistance. The following discussion outlines key sources of funding potentially available for capital improvements at Tillamook Airport.

FEDERAL AIRPORT GRANTS

Through federal legislation over the years, various grant-in-aid programs have been established to develop and maintain a system of public use airports across the United States. The purpose of this system and its federally based funding is to maintain national defense and to promote interstate commerce. The most recent legislation affecting federal funding was enacted in late 2003 and is titled *Century of Flight Authorization Act of 2003,* or Vision 100*.*

The four-year bill covered FAA fiscal years 2004, 2005, 2006, and 2007. Airport Improvement Program (AIP) funding was authorized at $3.4 billion in 2004, $3.5 billion in 2005, $3.6 billion in 2006, and $3.7 billion in 2007. This bill provided the FAA the opportunity to plan for longer term projects versus one-year reauthorizations. A new multi-year bill has been passed by Congress, continuing funding authority through 2015.

The source for AIP funds is the Aviation Trust Fund. The Aviation Trust Fund was established in 1970 to provide funding for aviation capital investment programs (aviation devel-opment, facilities and equipment, and research and development). The Aviation Trust Fund also finances the operation of the FAA. It is funded by user fees, including taxes on airline tickets, aviation fuel, and various aircraft parts.

Funding for AIP-eligible projects is undertaken through a cost sharing arrangement in which FAA provides up to 95 percent of the cost and the airport sponsor invests the remaining five percent. In exchange for this level of funding, the airport sponsor is required to meet various grant assurances, including maintaining the improvement for its useful life (usually 20 years).

Entitlement Funds

Federal funds are distributed each year by the FAA from appropriations by Congress. A portion of the annual distribution is to commercial service airports based upon minimum enplanement levels of at least 10,000 passengers annually.

General aviation airports can receive up to $150,000 each year in Non-Primary Entitlement (NPE) funds (National Plan of Integrated Airport Systems [NPIAS] inclusion is required for general aviation entitlement funding). These funds can be carried over and combined for up to four years, thereby allowing for completion of a more expensive project. In the past, Tillamook Airport has received NPE funding.

Discretionary Funds

The remaining AIP funds are distributed by the FAA based on the priority of the project for which they have requested federal assistance through discretionary apportionments. A national priority ranking system is used to evaluate and rank each airport project. Those projects with the highest priority from airports across the country are given preference in funding. High priority projects include those related to meeting design standards, capacity improvements, and other safety enhancements.

Under the AIP program, examples of eligible development projects include the airfield, public aprons, and access roads. Additional buildings and structures may be eligible if the function of the structure is to serve airport operations in a non-revenue generating capacity, such as maintenance facilities. Some revenue-enhancing structures, such as T-hangars or terminal buildings, may be eligible if all airfield improvements have been made. However, the priority ranking of these facilities is very low.

Whereas entitlement monies are guaranteed on an annual basis, discretionary funds are not assured. If the combination of entitlement, discretionary, and airport sponsor match does not provide enough capital for planned development, projects may be delayed. Other supplemental funding sources are described in the following subsections.

FAA Facilities and Equipment (F&E) Program

The Airway Facilities Division of the FAA administers the Facilities and Equipment (F&E) Program. This program provides funding for the installation and maintenance of various na-vigational aids and equipment of the national airspace system. Under the F&E program, funding is provided for FAA airport traffic control towers (ATCTs), enroute navigational aids, on-airport navigational aids, and approach lighting systems.

While F&E still installs and maintains some navigational aids, on-airport facilities at general aviation airports have not been a priority. Therefore, airports often request funding assistance for navigational aids through AIP and then maintain the equipment on their own.

STATE AIRPORT GRANTS

*Connect*Oregon is an initiative first introduced in 2005 by the Oregon Legislature to invest in air, rail, marine, and transit infrastructure. The program is focused on improving the connections between the highway system and other modes of transportation to better integrate the multi-modal system, improve the flow of commerce, and remove delays. The first installment of this program provided

$100 million for 43 projects. The program was renewed at similar funding levels in both 2007 and 2009. The most recent installment of the program includes a commitment to set aside at least five percent of the total for rural airports in the state and no less than 10 percent to each of five regions. This insures that funding is distributed throughout the state, and that airports in different regions don't have to compete for funding with all Oregon airports.

Funding for the program is from lottery-based bonds, sold by the Oregon Department of Administrative Services, deposited into Oregon's Multimodal Transportation Fund, and administered by the Oregon Department of Transportation Local Government Section. Projects eligible for Oregon's Highway Fund are not eligible for *Connect*Oregon, which gives aviation projects less competition for funding (Oregon Department of Aviation).

Of the 43 projects funded under *Connect*Oregon I (as the 2005 bill is known), 10 were aviation projects. Projects included runway relocation, runway extension, air cargo facilities, maintenance facilities, terminal improvements, and aircraft services and fueling. Funding also went to a multi-region project of installing Automatic Dependent Surveillance – Broadcast (ADS-B) transceivers at various airports in the state. Similar aviation projects were funded with *Connect*Oregon II (2007) and III (2009).

Pavement Maintenance Program (PMP)

The PMP program is a state-funded aid program intended to assist airports in undertaking preventative maintenance. A local match is required depending on the category of the airport as defined in the *Oregon Aviation Plan*. The most recent recommended match for a regional general aviation airport, such as Tillamook Airport, was 10 percent. In addition, the Oregon Department of Aviation (through a subcontractor) inspects 66 Oregon airports, including Tillamook Airport, for pavement condition. This database of information helps airports meet FAA grant assurances for maintaining airport pavements.

LOCAL PROJECT FUNDING

The balance of project costs, after consideration has been given to grants, must be funded through local resources. The goal is to generate enough revenue to cover all operating and capital expenditures, including debt service. As with many general aviation airports, this is not always possible and other financing methods will be needed.

The Port of Tillamook Bay serves as the fixed base operator (FBO) for the airport. The Port receives revenue attributed to the airport from the rent of buildings and land within airport boundaries, aviation fuel sales, general airport retail sales, hunting permits, and the RV Park. In FY 2009-10 the total operating revenue from these sources was anticipated at $328,300, an increase of 2.4% from the preceding year.

Personnel expenses account for the bulk of airport related expenditures, followed by aviation fuel for retail sales, utilities, and insurance. Budgeted expenditures for FY 2009-10 were anticipated at $284,800, a decline of 10.2 percent from the preceding year. This was inclusive of $36,800 in debt service towards long term debt, but exclusive of depreciation.

All of Oregon's ports are defined as "special districts" and operate with broad leeway under state statutes with regard to ownership and operation of transportation facilities, acting as utility providers for industrial customers, and the ownership and operation of businesses in support of their overall operation (e.g., fuel distribution, processing facilities, and industrial parks). In addition, the State Legislature has provided ports with the ability to borrow money from the State for a broad variety of development projects, subject to project qualification and financing approval.

More recently, due to significant storm damage to the Port's rail line in December 2007, the Port has targeted alternative infrastructure projects for funding, including several within the airport property. The funds are offered by the Federal Emergency Management Agency (FEMA) at 75 percent of the final assessment of damage repair, and must have a 25 percent nonfederal match. Two development projects in the short term program are noted for funding with these grants: the new airport terminal/fixed base operation building on the west side of the airfield, and development of leas-able warehouse space in the airport business park (on the north side of the airfield).

There are several other local financing options for future development at the airport, including airport revenues, direct funding from the Port, general obligation or revenue bonds, and leasehold financing. These strategies could be used to fund the local matching share, or complete a project if grant funding cannot be arranged.

Leasehold financing refers to a developer or tenant financing improvements under a long term ground lease. The obvious advantage of such an arrangement is that it relieves the sponsor of all responsibility for raising the capital funds for improvements. However, the private development of facilities on a ground lease, particularly on property owned by a government agency, produces a unique set of concerns.

In particular, it may be more difficult to obtain private financing as only the improvements and the right to continue the lease can be claimed in the event of a default. Ground leases normally provide for the reversion of improvements to the airport at the end of the lease term, which reduces their potential value to a lender taking possession. Also, companies that want to own their property as a matter of financial policy may not locate where land is only available for lease.

SUMMARY

The resultant plan represents an airfield facility that fulfills aviation needs over a 20-year planning horizon and preserves long range viability while conforming to safety and design standards. It also maintains a landside complex that can be developed as demand dictates, for a variety of aircraft types and users. The primary goal is for Tillamook Airport, as a transportation entity owned and operated by the Port of Tillamook Bay, to maintain a self-supporting position without sacrificing service to the public.

DOCUMENT SOURCES

As previously mentioned, a variety of different sources were utilized in the inventory process. The following listing reflects a partial compilation of these sources. This does not include data provided by the airport management as part of their records, nor does it include airport drawings and photographs which were referenced for information. On-site inventory and interviews with staff tenants also contributed to the inventory effort.

Airport/Facility Directory, Northwest U.S., U.S. Department of Transportation, Federal Aviation Administration, National Aeronautical Charting Office, November 18, 2010 Edition.

National Plan of Integrated Airport Systems (NPIAS), U.S. Department of Transportation, Federal Aviation Administration (2011-2015).

Seattle South Sectional Chart, U.S. Department of Commerce, National Oceanic and Atmospheric Administration, August 26, 2010.

Strategic Business Plan for Port of Tillamook Bay, The Benkendorf Associates Corp., Dec. 2009

Woods & Poole Economics, Inc. (2011).

A number of Internet sites were also used to collect information for the inventory chapter. These include the following:

AirNav:
www.airnav.com
City of Tillamook:
http://www.tillamookor.gov/

FAA:
www.faa.gov

Oregon Department of Aviation:
http://www.oregon.gov/Aviation/

Oregon Labor Market Information System:
http://www.qualityinfo.org/olmisj/OlmisZine

Port of Tillamook Bay:
http://www.potb.org/

Portland State University, Population Research Center:
http://www.pdx.edu/prc/

U.S. Bureau of Labor Statistics:
www.bls.gov/

U.S. Census Bureau:
www.census.gov

Western Regional Climate Center:
http://www.wrcc.dri.edu/

Appendix A

GLOSSARY OF TERMS

A

ABOVE GROUND LEVEL: The elevation of a point or surface above the ground.

ACCELERATE-STOP DISTANCE AVAILABLE (ASDA): See declared distances.

ADVISORY CIRCULAR: External publications issued by the FAA consisting of nonregulatory material providing for the recommendations relative to a policy, guidance and information relative to a specific aviation subject.

AIR CARRIER: An operator which: (1) performs at least five round trips per week between two or more points and publishes flight schedules which specify the times, days of the week, and places between which such flights are performed; or (2) transports mail by air pursuant to a current contract with the U.S. Postal Service. Certified in accordance with Federal Aviation Regulation (FAR) Parts 121 and 127.

AIRCRAFT: A transportation vehicle that is used or intended for use for flight.

AIRCRAFT APPROACH CATEGORY: A grouping of aircraft based on 1.3 times the stall speed in their landing configuration at their maximum certificated landing weight. The categories are as follows:

- Category A: Speed less than 91 knots.
- Category B: Speed 91 knots or more, but less than 121 knots.
- Category C: Speed 121 knots or more, but less than 141 knots.
- Category D: Speed 141 knots or more, but less than 166 knots.
- Category E: Speed greater than 166 knots.

AIRCRAFT OPERATION: The landing, takeoff, or touch-and-go procedure by an aircraft on a runway at an airport.

AIRCRAFT OPERATIONS AREA (AOA): A restricted and secure area on the airport property designed to protect all aspects related to aircraft operations.

AIRCRAFT OWNERS AND PILOTS ASSOCIATION: A private organization serving the interests and needs of general aviation pilots and aircraft owners.

AIRCRAFT RESCUE AND FIRE FIGHTING: A facility located at an airport that provides emergency vehicles, extinguishing agents, and personnel responsible for minimizing the impacts of an aircraft accident or incident.

AIRFIELD: The portion of an airport which contains the facilities necessary for the operation of aircraft.

AIRLINE HUB: An airport at which an airline concentrates a significant portion of its activity and which often has a significant amount of connecting traffic.

AIRPLANE DESIGN GROUP (ADG): A grouping of aircraft based upon wingspan. The groups are as follows:

- Group I: Up to but not including 49 feet.
- Group II: 49 feet up to but not including 79 feet.
- Group III: 79 feet up to but not including 118 feet.
- Group IV: 118 feet up to but not including 171 feet.
- Group V: 171 feet up to but not including 214 feet.
- Group VI: 214 feet or greater.

AIRPORT AUTHORITY: A quasi-governmental public organization responsible for setting the policies governing the management and operation of an airport or system of airports under its jurisdiction.

AIRPORT BEACON: A navigational aid located at an airport which displays a rotating light beam to identify whether an airport is lighted.

AIRPORT CAPITAL IMPROVEMENT PLAN: The planning program used by the Federal Aviation Administration to identify, prioritize, and distribute funds for airport development and the needs of the National Airspace System to meet specified national goals and objectives.

AIRPORT ELEVATION: The highest point on the runway system at an airport expressed in feet above mean sea level (MSL).

AIRPORT IMPROVEMENT PROGRAM: A program authorized by the Airport and Airway

Improvement Act of 1982 that provides funding for airport planning and development.

AIRPORT LAYOUT DRAWING (ALD): The drawing of the airport showing the layout of existing and proposed airport facilities.

AIRPORT LAYOUT PLAN (ALP): A scaled drawing of the existing and planned land and facilities necessary for the operation and development of the airport.

AIRPORT LAYOUT PLAN DRAWING SET: A set of technical drawings depicting the current and future airport conditions. The individual sheets comprising the set can vary with the complexities of the airport, but the FAA-required drawings include the Airport Layout Plan (sometimes referred to as the Airport Layout Drawing (ALD), the Airport Airspace Drawing, and the Inner Portion of the Approach Surface Drawing, On-Airport Land Use Drawing, and Property Map.

AIRPORT MASTER PLAN: The planner's concept of the long-term development of an airport.

AIRPORT MOVEMENT AREA SAFETY SYSTEM: A system that provides automated alerts and warnings of potential runway incursions or other hazardous aircraft movement events.

AIRPORT OBSTRUCTION CHART: A scaled drawing depicting the Federal Aviation Regulation (FAR) Part 77 surfaces, a representation of objects that penetrate these surfaces, runway, taxiway, and ramp areas, navigational aids, buildings, roads and other detail in the vicinity of an airport.

AIRPORT REFERENCE CODE (ARC): A coding system used to relate airport design criteria to the operational (Aircraft Approach Category) to the physical characteristics (Airplane Design Group) of the airplanes intended to operate at the airport.

AIRPORT REFERENCE POINT (ARP): The latitude and longitude of the approximate center of the airport.

AIRPORT SPONSOR: The entity that is legally responsible for the management and operation of an airport, including the fulfillment of the requirements of laws and regulations related thereto.

AIRPORT SURFACE DETECTION EQUIPMENT: A radar system that provides air traffic controllers with a visual representation of the movement of aircraft and other vehicles on the ground on the airfield at an airport.

AIRPORT SURVEILLANCE RADAR: The primary radar located at an airport or in an air traffic control terminal area that receives a signal at an antenna and transmits the signal to air traffic control display equipment defining the location of aircraft in the air. The signal provides only the azimuth and range of aircraft from the location of the antenna.

AIRPORT TRAFFIC CONTROL TOWER (ATCT): A central operations facility in the terminal air traffic control system, consisting of a tower, including an associated instrument flight rule (IFR) room if radar equipped, using air/ground communications and/or radar, visual signaling and other devices to provide safe and expeditious movement of terminal air traffic.

AIR ROUTE TRAFFIC CONTROL CENTER: A facility which provides en route air traffic control service to aircraft operating on an IFR flight plan within controlled airspace over a large, multi-state region.

AIRSIDE: The portion of an airport that contains the facilities necessary for the operation of aircraft.

AIRSPACE: The volume of space above the surface of the ground that is provided for the operation of aircraft.

AIR TAXI: An air carrier certificated in accordance with FAR Part 121 and FAR Part 135 and authorized to provide, on demand, public transportation of persons and property by aircraft. Generally operates small aircraft "for hire" for specific trips.

AIR TRAFFIC CONTROL: A service operated by an appropriate organization for the purpose of providing for the safe, orderly, and expeditious flow of air traffic.

AIR ROUTE TRAFFIC CONTROL CENTER (ARTCC): A facility established to provide air traffic control service to aircraft operating on an IFR flight plan within controlled airspace and principally during the en route phase of flight.

AIR TRAFFIC CONTROL SYSTEM COMMAND CENTER: A facility operated by the FAA which is responsible for the central flow control, the central altitude reservation system, the airport reservation position system, and the air traffic service contingency command for the air traffic control system.

AIR TRAFFIC HUB: A categorization of commercial service airports or group of commercial service airports in a metropolitan or urban area based upon the proportion of annual national enplanements existing at the airport or airports. The categories are large hub, medium hub, small hub, or non-hub. It forms the basis for the apportionment of entitlement funds.

AIR TRANSPORT ASSOCIATION OF AMERICA: An organization consisting of the principal U.S. airlines that represents the interests of the airline industry on major aviation issues before federal, state, and local government bodies. It promotes air transportation safety by coordinating industry and governmental safety programs and it serves as a focal point for industry efforts to standardize practices and enhance the efficiency of the air transportation system.

ALERT AREA: See special-use airspace.

ALTITUDE: The vertical distance measured in feet above mean sea level.

ANNUAL INSTRUMENT APPROACH (AIA): An approach to an airport with the intent to land by an aircraft in accordance with an IFR flight plan when visibility is less than three miles and/or when the ceiling is at or below the minimum initial approach altitude.

APPROACH LIGHTING SYSTEM (ALS): An airport lighting facility which provides visual guidance to landing aircraft by radiating light beams by which the pilot aligns the aircraft with the extended centerline of the runway on his final approach and landing.

APPROACH MINIMUMS: The altitude below which an aircraft may not descend while on an IFR approach unless the pilot has the runway in sight.

APPROACH SURFACE: An imaginary obstruction limiting surface defined in FAR Part 77 which is longitudinally centered on an extended runway centerline and extends outward and upward from the primary surface at each end of a runway at a designated slope and distance based upon the type of available or planned approach by aircraft to a runway.

APRON: A specified portion of the airfield used for passenger, cargo or freight loading and unloading, aircraft parking, and the refueling, maintenance and servicing of aircraft.

AREA NAVIGATION: The air navigation procedure that provides the capability to establish and maintain a flight path on an arbitrary course that remains within the coverage area of navigational sources being used.

AUTOMATED TERMINAL INFORMATION SERVICE (ATIS): The continuous broadcast of recorded non-control information at towered airports. Information typically includes wind speed, direction, and runway in use.

AUTOMATED SURFACE OBSERVATION SYSTEM (ASOS): A reporting system that provides frequent airport ground surface weather observation data through digitized voice broadcasts and printed reports.

AUTOMATED WEATHER OBSERVATION STATION (AWOS): Equipment used to automatically record weather conditions (i.e. cloud height, visibility, wind speed and direction, temperature, dew point, etc.)

AUTOMATIC DIRECTION FINDER (ADF): An aircraft radio navigation system which senses and indicates the direction to a non-directional radio beacon (NDB) ground transmitter.

AVIGATION EASEMENT: A contractual right or a property interest in land over which a right of unobstructed flight in the airspace is established.

AZIMUTH: Horizontal direction expressed as the angular distance between true north and the direction of a fixed point (as the observer's heading).

B

BASE LEG: A flight path at right angles to the landing runway off its approach end. The base leg normally extends from the downwind leg to the intersection of the extended runway centerline. See "traffic pattern."

BASED AIRCRAFT: The general aviation aircraft that use a specific airport as a home base.

BEARING: The horizontal direction to or from any point, usually measured clockwise from true north or magnetic north.

BLAST FENCE: A barrier used to divert or dissipate jet blast or propeller wash.

BLAST PAD: A prepared surface adjacent to the end of a runway for the purpose of eliminating the erosion of the ground surface by the wind forces produced by airplanes at the initiation of takeoff operations.

BUILDING RESTRICTION LINE (BRL): A line which identifies suitable building area locations on the airport.

C

CAPITAL IMPROVEMENT PLAN: The planning program used by the Federal Aviation Administration to identify, prioritize, and distribute Airport Improvement Program funds for airport development and the needs of the National Airspace System to meet specified national goals and objectives.

CARGO SERVICE AIRPORT: An airport served by aircraft providing air transportation of property only, including mail, with an annual aggregate landed weight of at least 100,000,000 pounds.

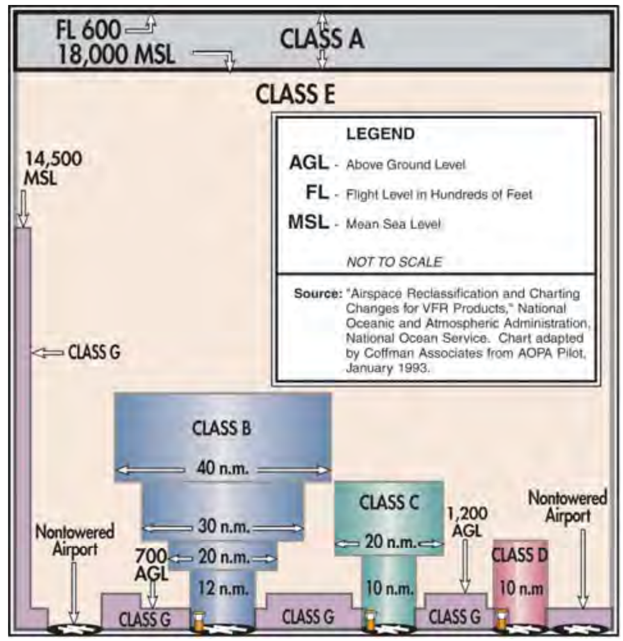
CATEGORY I: An Instrument Landing System (ILS) that provides acceptable guidance information to an aircraft from the coverage limits of the ILS to the point at which the localizer course line intersects the glide path at a decision height of 100 feet above the horizontal plane containing the runway threshold.

CATEGORY II: An ILS that provides acceptable guidance information to an aircraft from the coverage limits of the ILS to the point at which the localizer course line intersects the glide path at a decision height of 50 feet above the horizontal plane containing the runway threshold.

CATEGORY III: An ILS that provides acceptable guidance information to a pilot from the coverage limits of the ILS with no decision height specified above the horizontal plane containing the runway threshold.

CEILING: The height above the ground surface to the location of the lowest layer of clouds which is reported as either broken or overcast.

CIRCLING APPROACH: A maneuver initiated by the pilot to align the aircraft with the runway for landing when flying a predetermined circling instrument approach under IFR.



CLASS A AIRSPACE: See Controlled Airspace.

CLASS B AIRSPACE: See Controlled Airspace.

CLASS C AIRSPACE: See Controlled Airspace.

CLASS D AIRSPACE: See Controlled Airspace.

CLASS E AIRSPACE: See Controlled Airspace.

CLASS G AIRSPACE: See Controlled Airspace.

CLEAR ZONE: See Runway Protection Zone.

COMMERCIAL SERVICE AIRPORT: A public airport providing scheduled passenger service that enplanes at least 2,500 annual passengers.

COMMON TRAFFIC ADVISORY FREQUENCY: A radio frequency identified in the appropriate aeronautical chart which is designated for the purpose of transmitting airport advisory information and procedures while operating to or from an uncontrolled airport.

COMPASS LOCATOR (LOM): A low power, low/medium frequency radio-beacon installed in conjunction with the instrument landing system at one or two of the marker sites.

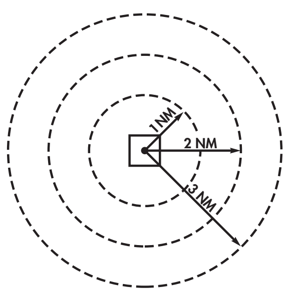
CONICAL SURFACE: An imaginary obstruction-limiting surface defined in FAR Part 77 that extends from the edge of the horizontal surface outward and upward at a slope of 20 to 1 for a horizontal distance of 4,000 feet.

CONTROLLED AIRPORT: An airport that has an operating airport traffic control tower.

CONTROLLED AIRSPACE: Airspace of defined dimensions within which air traffic control services are provided to instrument flight rules (IFR) and visual flight rules (VFR) flights in accordance with the airspace classification. Controlled airspace in the United States is designated as follows:

- **CLASS A**: Generally, the airspace from 18,000 feet mean sea level (MSL) up to but not including flight level FL600. All persons must operate their aircraft under IFR.

- **CLASS B**: Generally, the airspace from the surface to 10,000 feet MSL surrounding the nation's busiest airports. The configuration of Class B airspace is unique to each airport, but typically consists of two or more layers of air space and is designed to contain all published instrument approach procedures to the airport. An air traffic control clearance is required for all aircraft to operate in the area.



- **CLASS C**: Generally, the airspace from the surface to 4,000 feet above the airport elevation (charted as MSL) surrounding those airports that have an operational control tower and radar approach control and are served by a qualifying number of IFR operations or passenger enplanements. Although individually tailored for each airport, Class C airspace typically consists of a surface area with a five nautical mile (nm) radius and an outer area with a 10 nautical mile radius that extends from 1,200 feet to 4,000 feet above the airport elevation. Two-way radio communication is required for all aircraft.

- **CLASS D**: Generally, that airspace from the surface to 2,500 feet above the air port elevation (charted as MSL) surrounding those airports that have an operational control tower. Class D airspace is individually tailored and configured to encompass published instrument approach procedure . Unless otherwise authorized, all persons must establish two-way radio communication.

- **CLASS E**: Generally, controlled airspace that is not classified as Class A, B, C, or D. Class E airspace extends upward from either the surface or a designated altitude to the overlying or adjacent controlled airspace. When designated as a surface area, the airspace will be configured to contain all instrument procedures. Class E airspace encompasses all Victor Airways. Only aircraft following instrument flight rules are required to establish two-way radio communication with air traffic control.

- **CLASS G**: Generally, that airspace not classified as Class A, B, C, D, or E. Class G airspace is uncontrolled for all aircraft. Class G airspace extends from the surface to the overlying Class E airspace.

CONTROLLED FIRING AREA: See special-use airspace.

CROSSWIND: A wind that is not parallel to a runway centerline or to the intended flight path of an aircraft.

CROSSWIND COMPONENT: The component of wind that is at a right angle to the runway centerline or the intended flight path of an aircraft.

CROSSWIND LEG: A flight path at right angles to the landing runway off its upwind end. See "traffic pattern."

D

DECIBEL: A unit of noise representing a level relative to a reference of a sound pressure 20 micro newtons per square meter.

DECISION HEIGHT: The height above the end of the runway surface at which a decision must be made by a pilot during the ILS or Precision Approach Radar approach to either continue the approach or to execute a missed approach.

DECLARED DISTANCES: The distances declared available for the airplane's takeoff runway, takeoff distance, accelerate-stop distance, and landing distance requirements. The distances are:

- **TAKEOFF RUNWAY AVAILABLE (TORA)**: The runway length declared available and suitable for the ground run of an airplane taking off.

- **TAKEOFF DISTANCE AVAILABLE (TODA)**: The TORA plus the length of any remaining runway and/or clear way beyond the far end of the TORA.

- **ACCELERATE-STOP DISTANCE AVAILABLE (ASDA)**: The runway plus stopway length declared available for the acceleration and deceleration of an aircraft aborting a takeoff.

- **LANDING DISTANCE AVAILABLE (LDA)**: The runway length declared available and suitable for landing.

DEPARTMENT OF TRANSPORTATION: The cabinet level federal government organization consisting of modal operating agencies, such as the Federal Aviation Administration, which was established to promote the coordination of federal transportation programs and to act as a focal point for research and development efforts in transportation.

DISCRETIONARY FUNDS: Federal grant funds that may be appropriated to an airport based upon designation by the Secretary of Transportation or Congress to meet a specified national priority such as enhancing capacity, safety, and security, or mitigating noise.

DISPLACED THRESHOLD: A threshold that is located at a point on the runway other than the designated beginning of the runway.

DISTANCE MEASURING EQUIPMENT (DME): Equipment (airborne and ground) used to measure, in nautical miles, the slant range distance of an aircraft from the DME navigational aid.

DNL: The 24-hour average sound level, in Aweighted decibels, obtained after the addition of ten decibels to sound levels for the periods between 10 p.m. and 7 a.m. as averaged over a span of one year. It is the FAA standard metric for determining the cumulative exposure of individuals to noise.

DOWNWIND LEG: A flight path parallel to the landing runway in the direction opposite to landing. The downwind leg normally extends between the crosswind leg and the base leg. Also see "traffic pattern."

E

EASEMENT: The legal right of one party to use a portion of the total rights in real estate owned by another party. This may include the right of passage over, on, or below the property; certain air rights above the property, including view rights; and the rights to any specified form of development or activity, as well as any other legal rights in the property that may be specified in the easement document.

ELEVATION: The vertical distance measured in feet above mean sea level.

ENPLANED PASSENGERS: The total number of revenue passengers boarding aircraft, including originating, stop-over, and transfer passengers, in scheduled and nonscheduled services.

ENPLANEMENT: The boarding of a passenger, cargo, freight, or mail on an aircraft at an airport.

ENTITLEMENT: Federal funds for which a commercial service airport may be eligible based upon its annual passenger enplanements.

ENVIRONMENTAL ASSESSMENT (EA): An environmental analysis performed pursuant to the National Environmental Policy Act to determine whether an action would significantly affect the environment and thus require a more detailed environmental impact statement.

ENVIRONMENTAL AUDIT: An assessment of the current status of a party's compliance with applicable environmental requirements of a party's environmental compliance policies, practices, and controls.

ENVIRONMENTAL IMPACT STATEMENT (EIS): A document required of federal agencies by the National Environmental Policy Act for major projects are legislative proposals affecting the environment. It is a tool for decision-making describing the positive and negative effects of a proposed action and citing alternative actions.

ESSENTIAL AIR SERVICE: A federal program which guarantees air carrier service to selected small cities by providing subsidies as needed to prevent these cities from such service.

F

FEDERAL AVIATION REGULATIONS: The general and permanent rules established by the executive departments and agencies of the Federal Government for aviation, which are published in the Federal Register. These are the aviation subset of the Code of Federal Regulations.

FEDERAL INSPECTION SERVICES: The provision of customs and immigration services including passport inspection, inspection of baggage, the collection of duties on certain imported items, and the inspections for agricultural products, illegal drugs, or other restricted items.

FINAL APPROACH: A flight path in the direction of landing along the extended runway centerline. The final approach normally extends from the base leg to the runway. See "traffic pattern."

FINAL APPROACH AND TAKEOFF AREA (FATO). A defined area over which the final phase of the helicopter approach to a hover, or a landing is completed and from which the takeoff is initiated.

FINAL APPROACH FIX: The designated point at which the final approach segment for an aircraft landing on a runway begins for a non-precision approach.

FINDING OF NO SIGNIFICANT IMPACT (FONSI): A public document prepared by a Federal agency that presents the rationale why a proposed action will not have a significant effect on the environment and for which an environmental impact statement will not be prepared.

FIXED BASE OPERATOR (FBO): A provider of services to users of an airport. Such services include, but are not limited to, hangaring, fueling, flight training, repair, and maintenance.

FLIGHT LEVEL: A designation for altitude within controlled airspace.

FLIGHT SERVICE STATION: An operations facility in the national flight advisory system which utilizes data interchange facilities for the collection and dissemination of Notices to Airmen, weather, and administrative data and which provides pre-flight and in-flight advisory services to pilots through air and ground based communication facilities.

FRANGIBLE NAVAID: A navigational aid which retains its structural integrity and stiffness up to a designated maximum load, but on impact from a greater load, breaks, distorts, or yields in such a manner as to present the minimum hazard to aircraft.

G

GENERAL AVIATION: That portion of civil aviation which encompasses all facets of aviation except air carriers holding a certificate of convenience and necessity, and large aircraft commercial operators.

GENERAL AVIATION AIRPORT: An airport that provides air service to only general aviation.

GLIDESLOPE (GS): Provides vertical guidance for aircraft during approach and landing. The glideslope consists of the following:

1. Electronic components emitting signals which provide vertical guidance by reference to airborne instruments during instrument approaches such as ILS; or

2. Visual ground aids, such as VASI, which provide vertical guidance for VFR approach or for the visual portion of an instrument approach and landing.

GLOBAL POSITIONING SYSTEM (GPS): A system of 24 satellites used as reference points to enable navigators equipped with GPS receivers to determine their latitude, longitude, and altitude.

GROUND ACCESS: The transportation system on and around the airport that provides access to and from the airport by ground transportation vehicles for passengers, employees, cargo, freight, and airport services.

H

HELIPAD: A designated area for the takeoff, landing, and parking of helicopters.

HIGH INTENSITY RUNWAY LIGHTS: The highest classification in terms of intensity or brightness for lights designated for use in delineating the sides of a runway.

HIGH-SPEED EXIT TAXIWAY: A long radius taxiway designed to expedite aircraft turning off the runway after landing (at speeds to 60 knots), thus reducing runway occupancy time.

HORIZONTAL SURFACE: An imaginary obstruction- limiting surface defined in FAR Part 77 that is specified as a portion of a horizontal plane surrounding a runway located 150 feet above the established airport elevation. The specific horizontal dimensions of this surface are a function of the types of approaches existing or planned for the runway.

I

INITIAL APPROACH FIX: The designated point at which the initial approach segment begins for an instrument approach to a runway.

INSTRUMENT APPROACH PROCEDURE: A series of predetermined maneuvers for the orderly transfer of an aircraft under instrument flight conditions from the beginning of the initial approach to a landing, or to a point from which a landing may be made visually.

INSTRUMENT FLIGHT RULES (IFR): Procedures for the conduct of flight in weather conditions below Visual Flight Rules weather minimums. The term IFR is often also used to define weather conditions and the type of flight plan under which an aircraft is operating.

INSTRUMENT LANDING SYSTEM (ILS): A precision instrument approach system which normally consists of the following electronic components and visual aids:

1. Localizer.
2. Glide Slope.
3. Outer Marker.
4. Middle Marker.
5. Approach Lights.

INSTRUMENT METEOROLOGICAL CONDITIONS: Meteorological conditions expressed in terms of specific visibility and ceiling conditions that are less than the minimums specified for visual meteorological conditions.

ITINERANT OPERATIONS: Operations by aircraft that are not based at a specified airport.

K

KNOTS: A unit of speed length used in navigation that is equivalent to the number of nautical miles traveled in one hour.

L

LANDSIDE: The portion of an airport that provides the facilities necessary for the processing of passengers, cargo, freight, and ground transportation vehicles.

LANDING DISTANCE AVAILABLE (LDA): See declared distances.

LARGE AIRPLANE: An airplane that has a maximum certified takeoff weight in excess of 12,500 pounds.

LOCAL AREA AUGMENTATION SYSTEM: A differential GPS system that provides localized measurement correction signals to the basic GPS signals to improve navigational accuracy integrity, continuity, and availability.

LOCAL OPERATIONS: Aircraft operations performed by aircraft that are based at the airport and that operate in the local traffic pattern or within sight of the airport, that are known to be departing for or arriving from flights in local practice areas within a prescribed distance from the airport, or that execute simulated instrument approaches at the airport.

LOCAL TRAFFIC: Aircraft operating in the traffic pattern or within sight of the tower, or aircraft known to be departing or arriving from the local practice areas, or aircraft executing practice instrument approach procedures. Typically, this includes touch and-go training operations.

LOCALIZER: The component of an ILS which provides course guidance to the runway.

LOCALIZER TYPE DIRECTIONAL AID (LDA): A facility of comparable utility and accuracy to a localizer, but is not part of a complete ILS and is not aligned with the runway.

LONG RANGE NAVIGATION SYSTEM (LORAN): Long range navigation is an electronic navigational aid which determines aircraft position and speed by measuring the difference in the time of reception of synchronized pulse signals from two fixed transmitters. Loran is used for en route navigation.

LOW INTENSITY RUNWAY LIGHTS: The lowest clas- sification in terms of intensity or brightness for lights designated for use in delineating the sides of a runway.

M

MEDIUM INTENSITY RUNWAY LIGHTS: The middle classification in terms of intensity or brightness for lights designated for use in delineating the sides of a runway.

MICROWAVE LANDING SYSTEM (MLS): An instrument approach and landing system that provides precision guidance in azimuth, elevation, and distance measurement.

MILITARY OPERATIONS: Aircraft operations that are performed in military aircraft.

MILITARY OPERATIONS AREA (MOA): See special-use airspace

MILITARY TRAINING ROUTE: An air route depicted on aeronautical charts for the conduct of military flight training at speeds above 250 knots.

MISSED APPROACH COURSE (MAC): The flight route to be followed if, after an instrument approach, a landing is not affected, and occurring normally:

1. When the aircraft has descended to the decision height and has not established visual contact; or

2. When directed by air traffic control to pull up or to go around again.

MOVEMENT AREA: The runways, taxiways, and other areas of an airport which are utilized for taxiing/hover taxiing, air taxiing, takeoff, and landing of aircraft, exclusive of loading ramps and parking areas. At those airports with a tower, air traffic control clearance is required for entry onto the movement area.

N

NATIONAL AIRSPACE SYSTEM: The network of air traffic control facilities, air traffic control areas, and navigational facilities through the U.S.

NATIONAL PLAN OF INTEGRATED AIRPORT SYSTEMS: The national airport system plan developed by the Secretary of Transportation on a biannual basis for the development of public use airports to meet national air transportation needs.

NATIONAL TRANSPORTATION SAFETY BOARD: A federal government organization established to investigate and determine the probable cause of transportation accidents, to recommend equipment and procedures to enhance transportation safety, and to review on appeal the suspension or revocation of any certificates or licenses issued by the Secretary of Transportation.

NAUTICAL MILE: A unit of length used in navigation which is equivalent to the distance spanned by one minute of arc in latitude, that is, 1,852 meters or 6,076 feet. It is equivalent to approximately 1.15 statute mile.

NAVAID: A term used to describe any electrical or visual air navigational aids, lights, signs, and associated supporting equipment (i.e. PAPI, VASI, ILS, etc.)

NAVIGATIONAL AID: A facility used as, available for use as, or designed for use as an aid to air navigation.

NOISE CONTOUR: A continuous line on a map of the airport vicinity connecting all points of the same noise exposure level.

NON-DIRECTIONAL BEACON (NDB): A beacon transmitting nondirectional signals whereby the pilot of an aircraft equipped with direction finding equipment can determine his or her bearing to and from the radio beacon and home on, or track to, the station. When the radio beacon is installed in conjunction with the Instrument Landing System marker, it is normally called a Compass Locator.

NON-PRECISION APPROACH PROCEDURE: A standard instrument approach procedure in which no electronic glide slope is provided, such as VOR, TACAN, NDB, or LOC.

NOTICE TO AIRMEN: A notice containing information concerning the establishment, condition, or change in any component of or hazard in the National Airspace System, the timely knowledge of which is considered essential to personnel concerned with flight operations.

O

OBJECT FREE AREA (OFA): An area on the ground centered on a runway, taxiway, or taxilane centerline provided to enhance the safety of aircraft operations by having the area free of objects, except for objects that need to be located in the OFA for air navigation or aircraft ground maneuvering purposes.

OBSTACLE FREE ZONE (OFZ): The airspace below 150 feet above the established airport elevation and along the runway and extended runway centerline that is required to be kept clear of all objects, except for frangible visual NAVAIDs that need to be located in the OFZ because of their function, in order to provide clearance for aircraft landing or taking off from the runway, and for missed approaches.

ONE-ENGINE INOPERABLE SURFACE: A surface emanating from the runway end at a slope ratio of 62.5:1. Air carrier airports are required to maintain a technical drawing of this surface depicting any object penetrations by January 1, 2010.

OPERATION: The take-off, landing, or touch-and-go procedure by an aircraft on a runway at an airport.

OUTER MARKER (OM): An ILS navigation facility in the terminal area navigation system located four to seven miles from the runway edge on the extended centerline, indicating to the pilot that he/she is passing over the facility and can begin final approach.

P

PILOT CONTROLLED LIGHTING: Runway lighting systems at an airport that are controlled by activating the microphone of a pilot on a specified radio frequency.

PRECISION APPROACH: A standard instrument approach procedure which provides runway alignment and glide slope (descent) information. It is categorized as follows:

- **CATEGORY I (CAT I)**: A precision approach which provides for approaches with a decision height of not less than 200 feet and visibility not less than 1/2 mile or Runway Visual Range (RVR) 2400 (RVR 1800) with operative touchdown zone and runway centerline lights.

- **CATEGORY II (CAT II)**: A precision approach which provides for approaches with a decision height of not less than 100 feet and visibility not less than 1200 feet RVR.

- **CATEGORY III (CAT III)**: A precision approach which provides for approaches with minima less than Category II.

PRECISION APPROACH PATH INDICATOR (PAPI): A lighting system providing visual approach slope guidance to aircraft during a landing approach. It is similar to a VASI but provides a sharper transition between the colored indicator lights.

PRECISION APPROACH RADAR: A radar facility in the terminal air traffic control system used to detect and display with a high degree of accuracy the direction, range, and elevation of an aircraft on the final approach to a runway.

PRECISION OBJECT FREE AREA (POFA): An area centered on the extended runway centerline, beginning at the runway threshold and extending behind the runway threshold that is 200 feet long by 800 feet wide. The POFA is a clearing standard which requires the POFA to be kept clear of above ground objects protruding above the runway safety area edge elevation (except for frangible NAVAIDS). The POFA applies to all new authorized instrument approach procedures with less than 3/4 mile visibility.

PRIMARY AIRPORT: A commercial service airport that enplanes at least 10,000 annual passengers.

PRIMARY SURFACE: An imaginary obstruction limiting surface defined in FAR Part 77 that is specified as a rectangular surface longitudinally centered about a runway. The specific dimensions of this surface are a function of the types of approaches existing or planned for the runway.

PROHIBITED AREA: See special-use airspace.

PVC: Poor visibility and ceiling. Used in determining Annual Service Volume. PVC conditions exist when the cloud ceiling is less than 500 feet and visibility is less than one mile.

R

RADIAL: A navigational signal generated by a Very High Frequency Omni-directional Range or VORTAC station that is measured as an azimuth from the station.

REGRESSION ANALYSIS: A statistical technique that seeks to identify and quantify the relationships between factors associated with a forecast.

REMOTE COMMUNICATIONS OUTLET (RCO): An unstaffed transmitter receiver/facility remotely controlled by air traffic personnel. RCOs serve flight service stations (FSSs). RCOs were established to provide ground-to-ground communications between air traffic control specialists and pilots at satellite airports for delivering en route clearances, issuing departure authorizations, and acknowledging instrument flight rules cancellations or departure/landing times.

REMOTE TRANSMITTER/RECEIVER (RTR): See remote communications outlet. RTRs serve ARTCCs.

RELIEVER AIRPORT: An airport to serve general aviation aircraft which might otherwise use a congested air-carrier served airport.

RESTRICTED AREA: See special-use airspace.

RNAV: Area navigation - airborne equipment which permits flights over determined tracks within prescribed accuracy tolerances without the need to overfly ground-based navigation facilities. Used en route and for approaches to an airport.

RUNWAY: A defined rectangular area on an airport prepared for aircraft landing and takeoff. Runways are normally numbered in relation to their magnetic direction, rounded off to the nearest 10 degrees. For example, a runway with a magnetic heading of 180 would be designated Runway 18. The runway heading on the opposite end of the runway is 180 degrees from that runway end. For example, the opposite runway heading for Runway 18 would be Runway 36 (magnetic heading of 360). Aircraft can takeoff or land from either end of a runway, depending upon wind direction.

RUNWAY ALIGNMENT INDICATOR LIGHT: A series of high intensity sequentially flashing lights installed on the extended centerline of the runway usually in conjunction with an approach lighting system.

RUNWAY END IDENTIFIER LIGHTS (REIL): Two synchronized flashing lights, one on each side of the runway threshold, which provide rapid and positive identification of the approach end of a particular runway.

RUNWAY GRADIENT: The average slope, measured in percent, between the two ends of a runway.

RUNWAY PROTECTION ZONE (RPZ): An area off the runway end to enhance the protection of people and property on the ground. The RPZ is trapezoidal in shape. Its dimensions are determined by the aircraft approach speed and runway approach type and minima.

RUNWAY SAFETY AREA (RSA): A defined surface surrounding the runway prepared or suitable for reducing the risk of damage to airplanes in the event of an undershoot, overshoot, or excursion from the runway.

RUNWAY VISIBILITY ZONE (RVZ): An area on the airport to be kept clear of permanent objects so that there is an unobstructed line of- site from any point five feet above the runway centerline to any point five feet above an intersecting runway centerline.

RUNWAY VISUAL RANGE (RVR): An instrumentally derived value, in feet, representing the horizontal distance a pilot can see down the runway from the runway end.

S

SCOPE: The document that identifies and defines the tasks, emphasis, and level of effort associated with a project or study.

SEGMENTED CIRCLE: A system of visual indicators designed to provide traffic pattern information at airports without operating control towers.

SHOULDER: An area adjacent to the edge of paved runways, taxiways, or aprons providing a transition between the pavement and the adjacent surface; support for aircraft running off the pavement; enhanced drainage; and blast protection. The shoulder does not necessarily need to be paved.

SLANT-RANGE DISTANCE: The straight line distance between an aircraft and a point on the ground.

SMALL AIRPLANE: An airplane that has a maximum certified takeoff weight of up to 12,500 pounds.

SPECIAL-USE AIRSPACE: Airspace of defined dimensions identified by a surface area wherein activities must be confined because of their nature and/or wherein limitations may be imposed upon aircraft operations that are not a part of those activities. Special-use airspace classifications include:

- **ALERT AREA**: Airspace which may contain a high volume of pilot training activities or an unusual type of aerial activity, neither of which is hazardous to aircraft.

- **CONTROLLED FIRING AREA**: Airspace wherein activities are conducted under conditions so controlled as to eliminate hazards to nonparticipating aircraft and to ensure the safety of persons or property on the ground.

- **MILITARY OPERATIONS AREA (MOA)**: Designated airspace with defined vertical and lateral dimensions established outside Class A airspace to separate/segregate certain military activities from instrument flight rule (IFR) traffic and to identify for visual flight rule (VFR) traffic where these activities are conducted.

- **PROHIBITED AREA**: Designated airspace within which the flight of aircraft is prohibited.

- **RESTRICTED AREA**: Airspace designated under Federal Aviation Regulation (FAR) 73, within which the flight of aircraft, while not wholly prohibited, is subject to restriction. Most restricted areas are designated joint use. When not in use by the using agency, IFR/VFR operations can be authorized by the controlling air traffic control facility.

- **WARNING AREA**: Airspace which may contain hazards to nonparticipating aircraft.

STANDARD INSTRUMENT DEPARTURE (SID): A preplanned coded air traffic control IFR departure routing, preprinted for pilot use in graphic and textual form only.

STANDARD INSTRUMENT DEPARTURE PROCEDURES: A published standard flight procedure to be utilized following takeoff to provide a transition between the airport and the terminal area or en route airspace.

STANDARD TERMINAL ARRIVAL ROUTE (STAR): A preplanned coded air traffic control IFR arrival routing, preprinted for pilot use in graphic and textual or textual form only.

STOP-AND-GO: A procedure wherein an aircraft will land, make a complete stop on the runway, and then commence a takeoff from that point. A stop-and-go is recorded as two operations: one operation for the landing and one operation for the takeoff.

STOPWAY: An area beyond the end of a takeoff runway that is designed to support an aircraft during an aborted takeoff without causing structural damage to the aircraft. It is not to be used for takeoff, landing, or taxiing by aircraft.

STRAIGHT-IN LANDING/APPROACH: A landing made on a runway aligned within 30 degrees of the final approach course following completion of an instrument approach.

T

TACTICAL AIR NAVIGATION (TACAN): An ultrahigh frequency electronic air navigation system which provides suitably-equipped aircraft a continuous indication of bearing and distance to the TACAN station.

TAKEOFF RUNWAY AVAILABLE (TORA): See declared distances.

TAKEOFF DISTANCE AVAILABLE (TODA): See declared distances.

TAXILANE: The portion of the aircraft parking area used for access between taxiways and aircraft parking positions.

TAXIWAY: A defined path established for the taxiing of aircraft from one part of an airport to another.

TAXIWAY SAFETY AREA (TSA): A defined surface alongside the taxiway prepared or suitable for reducing the risk of damage to an airplane unintentionally departing the taxiway.

TERMINAL INSTRUMENT PROCEDURES: Published flight procedures for conducting instrument approaches to runways under instrument meteorological conditions.

TERMINAL RADAR APPROACH CONTROL: An element of the air traffic control system responsible for monitoring the en-route and terminal segment of air traffic in the airspace surrounding airports with moderate to high levels of air traffic.

TETRAHEDRON: A device used as a landing direction indicator. The small end of the tetrahedron points in the direction of landing.

THRESHOLD: The beginning of that portion of the runway available for landing. In some instances the landing threshold may be displaced.

TOUCH-AND-GO: An operation by an aircraft that lands and departs on a runway without stopping or exiting the runway. A touch-and go is recorded as two operations: one operation for the landing and one operation for the takeoff.

TOUCHDOWN: The point at which a landing aircraft makes contact with the runway surface.

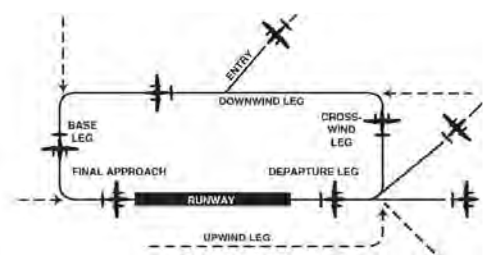
TOUCHDOWN AND LIFT-OFF AREA (TLOF): A load bearing, generally paved area, normally centered in the FATO, on which the helicopter lands or takes off.

TOUCHDOWN ZONE (TDZ): The first 3,000 feet of the runway beginning at the threshold.

TOUCHDOWN ZONE ELEVATION (TDZE): The highest elevation in the touchdown zone.

TOUCHDOWN ZONE (TDZ) LIGHTING: Two rows of transverse light bars located symmetrically about the runway centerline normally at 100- foot intervals. The basic system extends 3,000 feet along the runway.

TRAFFIC PATTERN: The traffic flow that is prescribed for aircraft landing at or taking off from an airport. The components of a typical traffic pattern are the upwind leg, crosswind leg, downwind leg, base leg, and final approach.



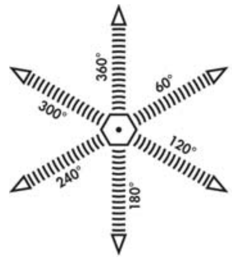
U

UNCONTROLLED AIRPORT: An airport without an air traffic control tower at which the control of Visual Flight Rules traffic is not exercised.

UNCONTROLLED AIRSPACE: Airspace within which aircraft are not subject to air traffic control.

UNIVERSAL COMMUNICATION (UNICOM): A nongovernment communication facility which may provide airport information at certain airports. Locations and frequencies of UNICOM's are shown on aeronautical charts and publications.

UPWIND LEG: A flight path parallel to the landing runway in the direction of landing. See "traffic pattern."



V

VECTOR: A heading issued to an aircraft to provide navigational guidance by radar.

VERY HIGH FREQUENCY/ OMNIDIRECTIONAL RANGE (VOR): A ground-based electronic navigation aid transmitting very high frequency navigation signals, 360 degrees in azimuth, oriented from magnetic north. Used as the basis for navigation in the national airspace system. The VOR periodically identifies itself by Morse Code and may have an additional voice identification feature.

VERY HIGH FREQUENCY OMNI-DIRECTIONAL RANGE/ TACTICAL AIR NAVIGATION (VORTAC): A navigation aid providing VOR azimuth, TACAN azimuth, and TACAN distance-measuring equipment (DME) at one site.

VICTOR AIRWAY: A control area or portion thereof established in the form of a corridor, the centerline of which is defined by radio navigational aids.

VISUAL APPROACH: An approach wherein an aircraft on an IFR flight plan, operating in VFR conditions under the control of an air traffic control facility and having an air traffic control authorization, may proceed to the airport of destination in VFR conditions.

VISUAL APPROACH SLOPE INDICATOR (VASI): An airport lighting facility providing vertical visual approach slope guidance to aircraft during approach to landing by radiating a directional pattern of high intensity red and white focused light beams which indicate to the pilot that he is on path if he sees red/white, above path if white/white, and below path if red/red. Some airports serving large aircraft have three-bar VASI's which provide two visual guide paths to the same runway.

VISUAL FLIGHT RULES (VFR): Rules that govern the procedures for conducting flight under visual conditions. The term VFR is also used in the United States to indicate weather conditions that are equal to or greater than minimum VFR requirements. In addition, it is used by pilots and controllers to indicate type of flight plan.

VISUAL METEOROLOGICAL CONDITIONS: Meteorological conditions expressed in terms of specific visibility and ceiling conditions which are equal to or greater than the threshold values for instrument meteorological conditions.

VOR: See "Very High Frequency Omnidirectional Range Station."

VORTAC: See "Very High Frequency Omnidirectional Range Station/Tactical Air Navigation."

W

WARNING AREA: See special-use airspace.

WIDE AREA AUGMENTATION SYSTEM: An enhancement of the Global Positioning System that includes integrity broadcasts, differential corrections, and additional ranging signals for the purpose of providing the accuracy, integrity, availability, and continuity required to support all phases of flight.

AC: advisory circular

ADF: automatic direction finder

ADG: airplane design group

AFSS: automated flight service station

AGL: above ground level

AIA: annual instrument approach

AIP: Airport Improvement Program

AIR-21: Wendell H. Ford Aviation Investment and Reform Act for the 21st Century

ALS: approach lighting system

ALSF-1: standard 2,400-foot high intensity approach lighting system with sequenced flashers (CAT I configuration)

ALSF-2: standard 2,400-foot high intensity approach lighting system with sequenced flashers (CAT II configuration)

AOA: Aircraft Operation Area

APV: instrument approach procedure with vertical guidance

ARC: airport reference code

ARFF: aircraft rescue and fire fighting

ARP: airport reference point

ARTCC: air route traffic control center

ASDA: accelerate-stop distance available

ASR: airport surveillance radar

ASOS: automated surface observation station

ATCT: airport traffic control tower

ATIS: automated terminal information service

AVGAS: aviation gasoline - typically 100 low lead (100L)

AWOS: automated weather observation station

BRL: building restriction line

CFR: Code of Federal Regulation

CIP: capital improvement program

DME: distance measuring equipment

DNL: day-night noise level

DWL: runway weight bearing capacity of aircraft with dual-wheel type landing gear

DTWL: runway weight bearing capacity of aircraft with dual-tandem type landing gear

FAA: Federal Aviation Administration

FAR: Federal Aviation Regulation

FBO: fixed base operator

FY: fiscal year

GPS: global positioning system

GS: glide slope

HIRL: high intensity runway edge lighting

IFR: instrument flight rules (FAR Part 91)

ILS: instrument landing system

IM: inner marker

LDA: localizer type directional aid

LDA: landing distance available

LIRL: low intensity runway edge lighting

LMM: compass locator at ILS outer marker

LORAN: long range navigation

MALS: midium intensity approach lighting system with indicator lights

MIRL: medium intensity runway edge lighting

MITL: medium intensity taxiway edge lighting

MLS: microwave landing system

MM: middle marker

MOA: military operations area

MLS: mean sea level

NAVAID: navigational aid

NDB: nondirectional radio beacon

NM: nautical mile (6,076.1 feet)

NPES: National Pollutant Discharge Elimination System

NPIAS: National Plan of Integrated Airport Systems

NPRM: notice of proposed rule making

ODALS: omnidirectional approach lighting system

OFA: object free area

OFZ: obstacle free zone

OM: outer marker

PAC: planning advisory committee

PAPI: precision approach path indicator

PFC: porous friction course

PFC: passenger facility charge

PCL: pilot-controlled lighting

PIW public information workshop

PLASI: pulsating visual approach slope indicator

POFA: precision object free area

PVASI: pulsating/steady visual approach slope indicator

PVC: poor visibility and ceiling

RCO: remote communications outlet

REIL: runway end identifier lighting

RNAV: area navigation

RPZ: runway protection zone

RSA: runway safety area

RTR: remote transmitter/receiver

RVR: runway visibility range

RVZ: runway visibility zone

SALS: short approach lighting system

SASP: state aviation system plan

SEL: sound exposure level

SID: standard instrument departure

SM: statute mile (5,280 feet)

SRE: snow removal equipment

SSALF: simplified short approach lighting system with runway alignment indicator lights

STAR: standard terminal arrival route

SWL: runway weight bearing capacity for aircraft with single-wheel tandem type landing gear

TACAN: tactical air navigational aid

TDZ: touchdown zone

TDZE: touchdown zone elevation

TAF: Federal Aviation Administration (FAA) Terminal Area Forecast

TODA: takeoff distance available

TORA: takeoff runway available

TRACON: terminal radar approach control

VASI: visual approach slope indicator

VFR: visual flight rules (FAR Part 91)

VHF: very high frequency

VOR: very high frequency omni-directional range

VORTAC: VOR and TACAN collocated

Appendix B

CIP TABLE

Appendix B

Airport Capital Improvement Program (ACIP)
Tillamook Airport
Port of Tillamook Bay

	Project Description				Total Cost	FAA Share*	State Share	Local Share
Short Term Program (Years 1-5)								
Year 1	Rehabilitate General Aviation Apron		lump sum		$20,000	$19,000	$475	$525
	Construct New Conventional Hangars	17600	sq. ft.	50	$880,000	$660,000	$0	$220,000
	Construct New Ramp/Access Taxilanes	3100	sq. yds.	50	$155,000	$147,250	$3,681	$4,069
Year 2	Install Security Fence (southwest)		lump sum		$135,000	$128,250	$3,206	$3,544
	Construct New Terminal/FBO Building (POTB)		lump sum		$1,200,000	$900,000	$0	$300,000
	Initiate FAA Release of Non-Aviation Use Parcels							
Year 3	Business Park Development (POTB)		lump sum		$5,675,000	$4,256,250	$0	$1,418,750
	Relocate Exit Taxiway near Terminal	1500	sq. yds.	50	$75,000	$71,250	$1,781	$1,969
	Install New REIL on Runway 13		lump sum		$20,000	$19,000	$475	$525
Year 4	Construct New Conventional Hangars	17600	sq. ft.	50	$880,000	$0	$0	$880,000
	Construct New Ramp/Taxilanes	3100	sq. yds.	50	$155,000	$147,250	$3,681	$4,069
Year 5	Construct New Air Cargo Ramp	3350	sq. yds.	50	$167,500	$159,125	$3,978	$4,397
	Construct New Runup Pads--Runway 13/31	2000	sq. yds.	50	$100,000	$95,000	$2,375	$2,625
Short Term Program Total					$9,462,500	$6,602,375	$19,653	$2,840,472
Intermediate Term Program (Years 6-10)								
	Relocate Threshold and Entrance Taxiway--Runway 1	7400	sq. yds.	50	$370,000	$351,500	$8,788	$9,713
	Relocate Threshold on Runway 19		lump sum		$20,000	$19,000	$475	$525
	Complete Lighting of All Taxiways (MITL)	2000	linear ft.	80	$160,000	$152,000	$3,800	$4,200
	Acquire RPZ in Runway 13 Approach	20	acres	15000	$300,000	$285,000	$7,125	$7,875
	Construct New T-Hangar Unit	10	units	50000	$500,000	$0	$0	$500,000
	Overlay Ramp/Hangar Taxilanes	15000	sq. yds.	30	$450,000	$427,500	$10,688	$11,813
	Acquire Airport Maintenance Equipment		lump sum		$200,000	$190,000	$4,750	$5,250
	Upgrade Airport Security/Fencing		lump sum		$200,000	$190,000	$4,750	$5,250
	Rehabilitate/Update Airfield Lighting/Navaids		lump sum		$100,000	$95,000	$2,375	$2,625
	Overlay Runway/Taxiway Pavements	50000	sq. yds.	30	$1,500,000	$1,425,000	$75,000	$0
Intermediate Term Program Total					$3,800,000	$3,135,000	$117,750	$547,250
Long Term Program (Years 11-20)								
	Extend Airport Access/Auto Parking	10000	sq. yds.	25	$250,000	$237,500	$5,938	$6,563
	Construct East Side Taxiway System	18700	sq. yds.	50	$935,000	$888,250	$22,206	$24,544
	Update Airport Security/Fencing		lump sum		$200,000	$190,000	$4,750	$5,250
	Acquire Airport Maintenance Equipment		lump sum		$200,000	$190,000	$4,750	$5,250
	Update Fuel Storage Facility		lump sum		$200,000	$0	$0	$200,000
	Expand Terminal/FBO Building	2500	sq. ft.	200	$500,000	$0	$0	$500,000
	Construct New T-Hangar Unit	10	units	50000	$500,000	$0	$0	$500,000
	Overlay Runway/Taxiway Pavements	50000	sq. yds.	30	$1,500,000	$1,425,000	$35,625	$39,375
	Rehabilitate/Update Airfield Lighting/Navaids		lump sum		$200,000	$190,000	$4,750	$5,250
	Overlay Ramp/Hangar Taxilanes	30000	sq. yds.	30	$900,000	$855,000	$21,375	$23,625
Long Term Program Total					$5,385,000	$3,975,750	$99,394	$1,309,856
TOTAL PROGRAM COSTS					$18,647,500	$13,713,125	$236,797	$4,697,578

Sources: Port of Tillamook Bay and PAE/Coffman Associates analysis.
* Several projects in short term program (hangars, terminal, and business park) assume FEMA funding (75/25 funding participation).
All costs are in current (2011) dollars and reflect current federal and/or state funding participation.

Appendix C

FAA APPROVAL LETTER

U.S. Department
of Transportation

**Federal Aviation
Administration**

Seattle Airports District Office
1601 Lind Avenue, S. W., Ste 250
Renton, Washington 98057-4056

January 3, 2011

Ms. Michele Bradley
General Manager
Port of Tillamook Bay
4000 Blimp Blvd.
Tillamook, OR 97141

Dear Ms. Bradley:

Tillamook Airport Master Plan Study
Airport Improvement Program (AIP) Project Number 3-41-0060-011

I have reviewed the Aviation Activity Forecast Section recently submitted by Coffman Associates, Inc., for the Airport. I find adequate justification exists for the figures cited in the forecast tables of the draft Narrative Report for the first 10 years based on their comparison to the most recent TAF (Terminal Area Forecast). For the 10-20 year period, however, it is recommended that the based aircraft forecast numbers be extrapolated from the first 10 year figure so that the future numbers are more in line with the TAF. The based aircraft numbers would more likely total 59 in the year 2025 and 64/65 in 2030.

As always, please feel free to contact me with any questions at: 425.227.2649 or by e-mail at: bruce.fisher@faa.gov.

Sincerely,

Bruce C. Fisher

Bruce C. Fisher
Airport Planner, Oregon / Idaho

cc: Mr. Stephen Wagner, Coffman Assoc., Inc.

Appendix D

AIRPORT LAYOUT PLAN DRAWING

U.S. Department
of Transportation
**Federal Aviation
Administration**

Northwest Mountain Region
Seattle Airports District Office
1601 Lind Avenue S.W., Suite 250
Renton, Washington 98057-3356

November 21, 2012

Ms. Michele Bradley
General Manager
Port of Tillamook Bay
4000 Blimp Blvd
Tillamook, OR 97141

Dear Ms. Bradley,

The Tillamook Airport Layout Plan (ALP) dated June, 2012 and submitted by Precision Approach Engineering / Coffman Assoc., is hereby approved. A signed copy of the ALP is enclosed.

This approval considers only the safety, utility, and efficiency of the Tillamook Airport, and is conditioned on acknowledgment that any development on airport property requiring federal environmental approval must receive such written approval from the Federal Aviation Administration (FAA) prior to commencement of the subject development. This ALP approval is also conditioned on acceptance of the plan under local land use laws. We encourage appropriate agencies to adopt land use and height restrictive zoning based on the plan since action toward this end is a prerequisite of the Airport Improvement Program (AIP). Grant Assurance 21, Compatible Land Use, requires airport sponsors to take appropriate action, 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 the arrival and departure of aircraft. The FAA recognizes residential development adjacent to the airport property as an incompatible land use.

Approval of the plan does not indicate that the United States will participate in the cost of any development proposed. When airport construction, alteration, or deactivation is undertaken, such action requires notification and review in accordance with the provisions of Part 77 and Part 157 of the Federal Aviation Regulations.

Please attach this letter to the approved Airport Layout Plan and retain it in the airport files for future use under the Airport Improvement Program.

Sincerely,

Carol A. Suomi

Carol A. Suomi
Manager, Seattle Airports District Office

Encl: Tillamook ALP dtd Jun 2012

cc:
Mr. John Shute, PAE

AIRPORT LAYOUT PLANS

FOR

Tillamook Airport

Prepared for

THE PORT OF TILLAMOOK BAY

Tillamook, Oregon

INDEX OF DRAWINGS

JUNE 2012

PRECISION APPROACH ENGINEERING

Coffman Associates Airport Consultants
www.coffmanassociates.com

LOCATION MAP

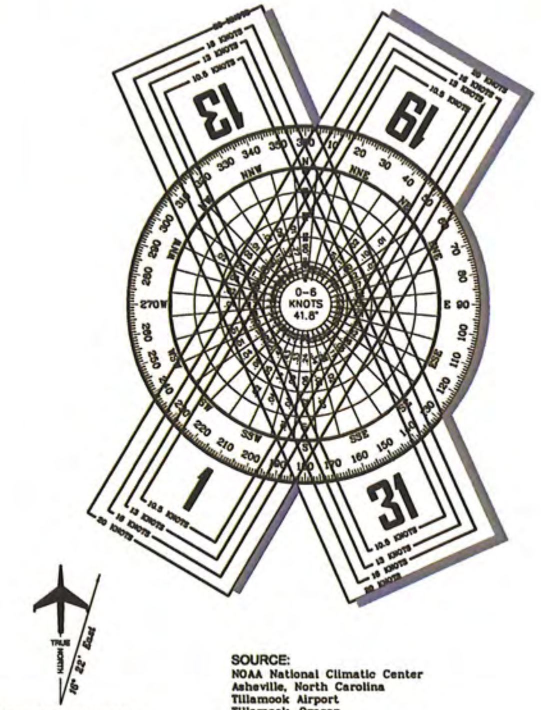
VICINITY MAP

AIRPORT DATA			
OWNER: The Port of Tillamook Bay	NPIAS CODE: General Aviation Airport (GA)		
CITY: Tillamook, Oregon	COUNTY: Tillamook	RANGE: R9W	TOWNSHIP: T2S
Tillamook Airport		EXISTING	ULTIMATE
AIRPORT SERVICE LEVEL		General Aviation	General Aviation
AIRPORT REFERENCE CODE		B–II	B–II
DESIGN CRITICAL AIRCRAFT		KING AIR 200	KING AIR 350
AIRPORT ELEVATION (NAVD88)		39.5 MSL	39.5 MSL
MEAN MAXIMUM TEMPERATURE OF HOTTEST MONTH		68.6° F (September)	68.6° F (September)
AIRPORT REFERENCE POINT (ARP) COORDINATES (NAD 83)	Latitude	45° 25' 05.671" N	45° 25' 06.718" N
	Longitude	123° 48' 51.782" W	123° 48' 50.613" W
AIRPORT INSTRUMENT APPROACHES		RNAV GPS (13)	RNAV GPS (13)
AIRPORT and TERMINAL NAVIGATIONAL AIDS		AWOS–3 Rotating Beacon Lighted Wind Cone	AWOS–3 Rotating Beacon Lighted Wind Cone
GPS Approach		YES	YES
Runway 13 End Coordinates (NAD 83) EL. 17.2 / TDZ EL. 28.1	Latitude	45° 25' 27.480" N	45° 25' 27.480" N
	Longitude	123° 49' 08.130" W	123° 49' 08.130" W
Runway 31 End Coordinates (NAD 83) EL. 36.1/TDZ EL. 36.1	Latitude	45° 24' 42.460" N	45° 24' 42.460" N
	Longitude	123° 48' 39.340" W	123° 48' 39.340" W
Runway 1 End Coordinates (NAD 83) EL. 25.5 / TDZ EL. 32.3	Latitude	45° 24' 54.544" N	45° 24' 55.775" N
	Longitude	123° 48' 58.630" W	123° 48' 57.593" W
Runway 19 End Coordinates (NAD 83) EL. 32.3 / TDZ EL. 32.3	Latitude	45° 25' 19.251" N	45° 25' 23.072" N
	Longitude	123° 48' 37.804" W	123° 48' 34.583" W

RUNWAY DATA	Runway 13-31				Runway 1-19			
	EXISTING		ULTIMATE		EXISTING		ULTIMATE	
AIRCRAFT APPROACH CATEGORY–DESIGN GROUP	B–II		B–II		B–I		B–II	
DESIGN CRITICAL AIRCRAFT	KING AIR		KING AIR		PIPER NAVAJO		CESSNA C441	
WINGSPAN OF DESIGN AIRCRAFT	54.5'/57.9'		54.5'/57.9'		40.7'		49.3'	
MAX. CERTIFIED TAKEOFF WEIGHT OF DESIGN A/C	12,500 lbs. (MTOW)		12,500 lbs. (MTOW)		6200 lbs. (MTOW)		9925 (MTOW)	
UNDERCARRIAGE WIDTH OF DESIGN AIRCRAFT	17.2'		17.2'		13.8'		–	
DESIGN AIRCRAFT APPROACH SPEED IN KNOTS	103 knots		103 knots		100 knots		100 knots	
RUNWAY CENTERLINE TO PARALLEL RUNWAY CENTERLINE	N/A		N/A		N/A		N/A	
TAXIWAY CENTERLINE TO FIXED OR MOVABLE OBJECT	65.5'		65.5'		44.5'		65.5'	
TAXIWAY WINGTIP CLEARANCE	26'		26'		20'		26'	
RUNWAY CENTERLINE TO PARALLEL TAXIWAY CENTERLINE	300'		300'		N/A		240'	
RUNWAY DIMENSIONS (L X W)	5,001' x 100'		5,001' x 75'		2,910' X 75'		3,215' x 75'	
RUNWAY TRUE BEARING (NGS SURVEY)	155.75°/335.76°		155.75°/335.76°		30.67°/210.67°		30.67°/210.67°	
RUNWAY WIND COVERAGE (16 KNOTS/18 MPH)	99.45%		99.45%		99.32%		99.32%	
RUNWAY SHOULDERS	10'		10'		10'		10'	
RUNWAY MAXIMUM ELEVATION/HIGH POINT (NAVD88)	39.5 MSL		39.5 MSL		35.7 MSL		37.4 MSL	
RUNWAY LOW POINT ELEVATION (NAVD88)	20.5 MSL		20.5 MSL		28.9 MSL		29.2 MSL	
RUNWAY LIGHTING (PCL)	MIRL		MIRL		MIRL		MIRL	
RUNWAY EFFECTIVE GRADIENT/MAXIMUM GRADIENT	0.4%		0.4%		0.2%		0.25%	
RUNWAY PAVEMENT MATERIAL / SURFACE TREATMENT	Asphalt		Asphalt		Asphalt		Asphalt	
RUNWAY PAVEMENT STRENGTH (IN THOUSAND LBS.) [1]	60(S), 75(D), 125(2D)		60(S), 75(D), 125(2D)		40(S), 46(D), 67(2D)		40(S), 46(D), 67(2D)	
LINE OF SIGHT REQUIREMENT MET	Yes		Yes		Yes		Yes	
RUNWAY PROTECTION ZONES	500' x 1000' x 700' (13) 500' x 1000' x 700' (31)		500' x 1000' x 700' (13) 500' x 1000' x 700' (31)		500' x 1000' x 700' (1) 500' x 1000' x 700' (19)		500' x 1000' x 700' (1) 500' x 1000' x 700' (19)	
TAXIWAY WIDTH	35'		35'		25'		35'	
TAXIWAY LIGHTING	Reflectors		Reflectors		Reflectors		Reflectors	
TAXIWAY MARKING	Centerline		Centerline		Centerline		Centerline	
TAXIWAY SURFACE MATERIAL	Asphalt		Asphalt		Asphalt		Asphalt	
TAXIWAY SAFETY AREA WIDTH	79'		79'		49'		79'	
TAXIWAY OBJECT FREE AREA WIDTH	131'		131'		89'		131'	
TAXIWAY HOLDING POSITION MARKING/HOLDSIGN	200'		200'		200'		200'	
Tillamook Airport	RUNWAY 13	RUNWAY 31	RUNWAY 13	RUNWAY 31	RUNWAY 1	RUNWAY 19	RUNWAY 1	RUNWAY 19
FAR PART 77 CATEGORY	NP–C	Visual (BV)	NP–C	Visual (BV)	Visual (AV)	Visual (AV)	Visual (BV)	Visual (BV)
FAR PART 77 APPROACH SLOPE	34:1	20:1	34:1	20:1	20:1	20:1	20:1	20:1
RUNWAY INSTRUMENTATION	1 mile	Visual	1 mile	Visual	Visual	Visual	Visual	Visual
RUNWAY MARKING	NP	NP	NP	NP	Visual	Visual	Visual	Visual
RUNWAY BLAST PAD	None	None	None	None	None	None	None	None
RUNWAY APPROACH VISIBILITY MINIMUMS (LOWEST)	1 mile	Visual	1 mile	Visual	Visual	Visual	Visual	Visual
RUNWAY APPROACH LIGHTING	None	None	None	None	None	None	None	None
PRECISION OBSTACLE FREE ZONE (800' X 200')	None	None	None	None	None	None	None	None
THRESHOLD SITING REQUIREMENTS (APPENDIX 2)	20:1	20:1	20:1	20:1	20:1	20:1	20:1	20:1
THRESHOLD SITING SURFACE OBJECT PENETRATIONS	None	Yes	None	Yes	None	None	None	None
RUNWAY END ELEVATION (NAVD88)	EL. 20.6	EL. 39.5	EL. 20.6	EL. 39.5	EL. 28.9	EL. 35.7	EL. 29.2	EL. 37.4
RUNWAY TOUCHDOWN ZONE ELEVATION (NAVD88)	EL. 31.5	EL. 39.5	EL. 31.5	EL. 39.5	EL. 35.7	EL. 35.7	EL. 36.7	EL. 37.4
RUNWAY SAFETY AREA (RSA BEYOND STOP END)	300'	300'	300'	300'	240'	240'	300'	300'
RUNWAY SAFETY AREA WIDTH	150'	150'	150'	150'	120'	120'	150'	150'
RUNWAY OBJECT FREE AREA (OFA BEYOND STOP END)	300'	300'	300'	300'	240'	240'	300'	300'
RUNWAY OBJECT FREE AREA WIDTH	500'	500'	500'	500'	400'	400'	500'	500'
RUNWAY OBSTACLE FREE ZONE (BEYOND STOP END)	200'	200'	200'	200'	200'	200'	200'	200'
RUNWAY OBSTACLE FREE ZONE WIDTH	400'	400'	400'	400'	400'	400'	400'	400'
ELECTRONIC NAVIGATIONAL AIDS	RNAV GPS	None	RNAV GPS	None	None	None	None	None
RUNWAY VISUAL NAVIGATIONAL AIDS	PAPI–2L REIL	PAPI–2L	PAPI–2L REIL	PAPI–2L	PAPI–2L	PAPI–2L	PAPI–2L	PAPI–2L

[1] PAVEMENT STRENGTHS ARE EXPRESSED IN SINGLE (S), DUAL (D), SINGLE TANDEM (2S), OR DUAL TANDEM (2D).

ALL WEATHER WIND COVERAGE				
Runways	10.5 Knots	13 Knots	16 Knots	20 Knots
Runway 1–19	95.13%	97.26%	99.32%	99.85%
Runway 13–31	95.52%	97.63%	99.45%	99.90%
Combined	98.97%	99.77%	99.96%	99.99%



Magnetic Declination
16° 28' East (September 2010)
Annual Rate of Change
00° 00' West (September 2010)

SOURCE:
NOAA National Climatic Center
Asheville, North Carolina
Tillamook Airport
Tillamook, Oregon

OBSERVATIONS:
28,149 All Weather Observations
2004–2010

No.	REVISIONS	DATE	BY	APP'D.
△	-	–	–	–
△	Property Line, MISC Facilities	Sept–07	JWS	–
△	ALP Update by David Evans & Associates INC.	Feb–98	R.Norton	–

"THE PREPARATION OF THESE DOCUMENTS WAS FINANCED IN PART THROUGH A PLANNING GRANT FROM THE FEDERAL AVIATION ADMINISTRATION AS PROVIDED UNDER SECTION 505 OF THE AIRPORT AND AIRWAY IMPROVEMENT ACT OF 1982, AS AMENDED. THE CONTENTS DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THESE DOCUMENTS BY THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATE IN ANY DEVELOPMENT DEPICTED HEREIN, NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE IN ACCORDANCE WITH APPROPRIATE PUBLIC LAWS."

TILLAMOOK AIRPORT

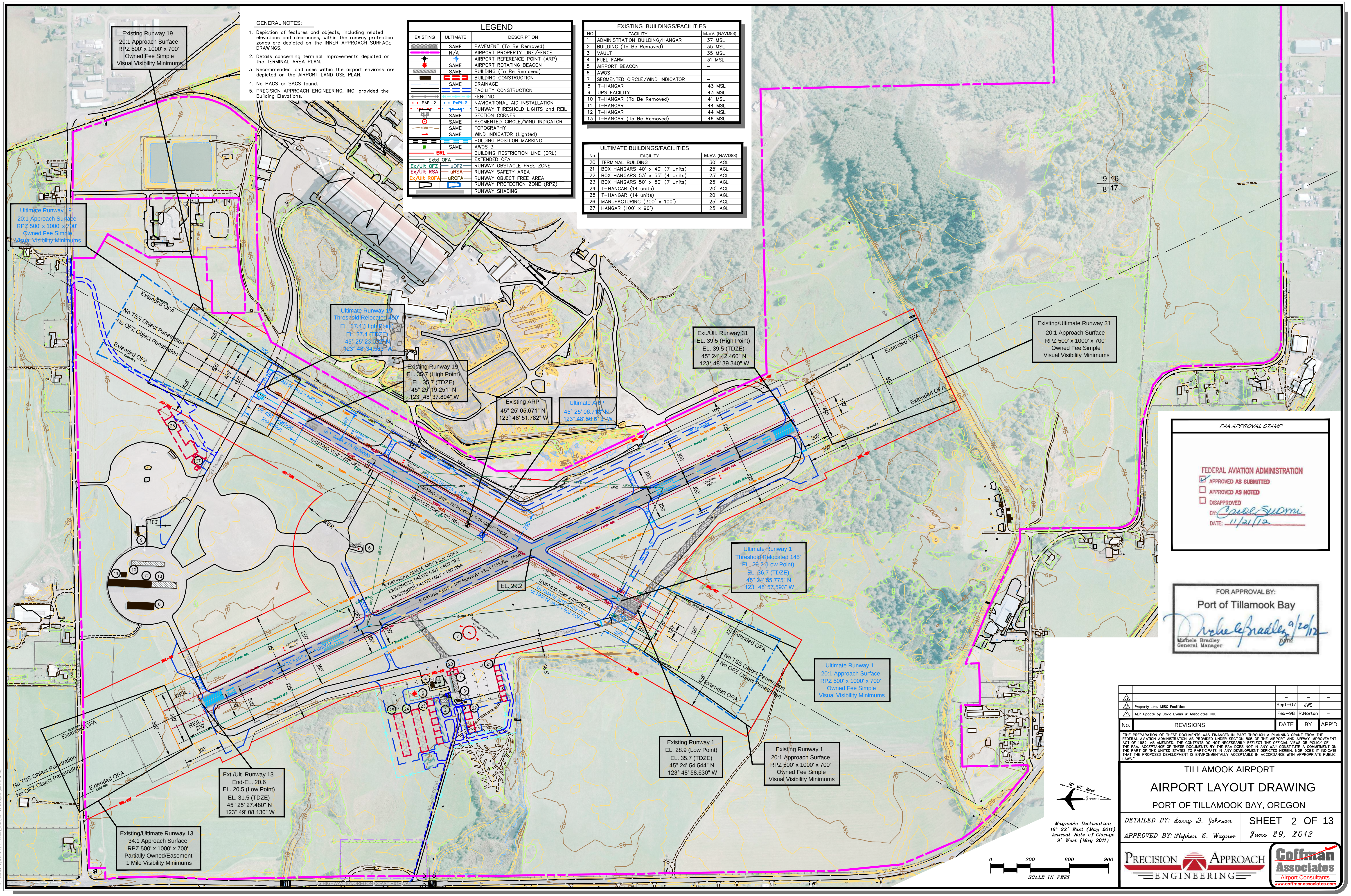
AIRPORT DATA

PORT OF TILLAMOOK BAY, OREGON

DETAILED BY: Larry D. Johnson	SHEET 1 OF 13
APPROVED BY: Stephen C. Wagner	June 29, 2012

PRECISION APPROACH ENGINEERING

Coffman Associates
Airport Consultants
www.coffmanassociates.com



GENERAL NOTES:

1. Depiction of features and objects, including related elevations and clearances, within the runway protection zones are depicted on the INNER APPROACH SURFACE DRAWINGS.
2. Details concerning terminal improvements depicted on the TERMINAL AREA PLAN.
3. Recommended land uses within the airport environs are depicted on the AIRPORT LAND USE PLAN.
4. No PACS or SACS found.
5. PRECISION APPROACH ENGINEERING, INC. provided the Building Elevations.

LEGEND

EXISTING	ULTIMATE	DESCRIPTION
	SAME	PAVEMENT (To Be Removed)
	N/A	AIRPORT PROPERTY LINE/FENCE
		AIRPORT REFERENCE POINT (ARP)
	SAME	AIRPORT ROTATING BEACON
	SAME	BUILDING (To Be Removed)
		BUILDING CONSTRUCTION
	SAME	DRAINAGE
		FACILITY CONSTRUCTION
		FENCING
PAPI-2	PAPI-2	NAVIGATIONAL AID INSTALLATION
		RUNWAY THRESHOLD LIGHTS and REIL
34 35 / 3 2	SAME	SECTION CORNER
	SAME	SEGMENTED CIRCLE/WIND INDICATOR
1080	SAME	TOPOGRAPHY
	SAME	WIND INDICATOR (Lighted)
		HOLDING POSITION MARKING
	SAME	AWOS 3
BRL		BUILDING RESTRICTION LINE (BRL)
Extd OFA		EXTENDED OFA
Ex/Ult OFZ	uOFZ	RUNWAY OBSTACLE FREE ZONE
Ex/Ult RSA	uRSA	RUNWAY SAFETY AREA
Ex/Ult ROFA	uROFA	RUNWAY OBJECT FREE AREA
		RUNWAY PROTECTION ZONE (RPZ)
		RUNWAY SHADING

EXISTING BUILDINGS/FACILITIES

NO.	FACILITY	ELEV. (NAVD88)
1	ADMINISTRATION BUILDING/HANGAR	37 MSL
2	BUILDING (To Be Removed)	35 MSL
3	VAULT	35 MSL
4	FUEL FARM	31 MSL
5	AIRPORT BEACON	–
6	AWOS	–
7	SEGMENTED CIRCLE/WIND INDICATOR	–
8	T-HANGAR	43 MSL
9	UPS FACILITY	43 MSL
10	T-HANGAR (To Be Removed)	41 MSL
11	T-HANGAR	44 MSL
12	T-HANGAR	44 MSL
13	T-HANGAR (To Be Removed)	46 MSL

ULTIMATE BUILDINGS/FACILITIES

No.	FACILITY	ELEV. (NAVD88)
20	TERMINAL BUILDING	30' AGL
21	BOX HANGARS 40' x 40' (7 Units)	25' AGL
22	BOX HANGARS 53' x 55' (4 Units)	25' AGL
23	BOX HANGARS 50' x 50' (7 Units)	25' AGL
24	T-HANGAR (14 units)	20' AGL
25	T-HANGAR (14 units)	20' AGL
26	MANUFACTURING (300' x 100')	25' AGL
27	HANGAR (100' x 90')	25' AGL

FAA APPROVAL STAMP

FEDERAL AVIATION ADMINISTRATION
APPROVED AS SUBMITTED
APPROVED AS NOTED
DISAPPROVED
BY: Carol Suomi
DATE: 11/21/12

FOR APPROVAL BY:
Port of Tillamook Bay
Michele Bradley 9/20/12
Michele Bradley
General Manager
DATE

No.	REVISIONS	DATE	BY	APP'D.
3	–	–	–	–
2	Property Line, MISC Facilities	Sept-07	JWS	–
1	ALP Update by David Evans & Associates INC.	Feb-98	R.Norton	–

"THE PREPARATION OF THESE DOCUMENTS WAS FINANCED IN PART THROUGH A PLANNING GRANT FROM THE FEDERAL AVIATION ADMINISTRATION AS PROVIDED UNDER SECTION 505 OF THE AIRPORT AND AIRWAY IMPROVEMENT ACT OF 1982, AS AMENDED. THE CONTENTS DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THESE DOCUMENTS BY THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATE IN ANY DEVELOPMENT DEPICTED HEREIN, NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE IN ACCORDANCE WITH APPROPRIATE PUBLIC LAWS."

TILLAMOOK AIRPORT

AIRPORT LAYOUT DRAWING

PORT OF TILLAMOOK BAY, OREGON

DETAILED BY: Larry D. Johnson

SHEET 2 OF 13

APPROVED BY: Stephen C. Wagner

June 29, 2012

PRECISION APPROACH ENGINEERING

Coffman Associates
Airport Consultants
www.coffmanassociates.com

GENERAL NOTES:

1. Depiction of features and objects, including related elevations and clearances, within the runway protection zones are depicted on the INNER APPROACH SURFACE DRAWINGS.
2. Details concerning terminal improvements depicted on the TERMINAL AREA PLAN.
3. Recommended land uses within the airport environs are depicted on the AIRPORT LAND USE PLAN.
4. No PACS or SACS found.
5. PRECISION APPROACH ENGINEERING, INC. provided the Building Elevations.

LEGEND

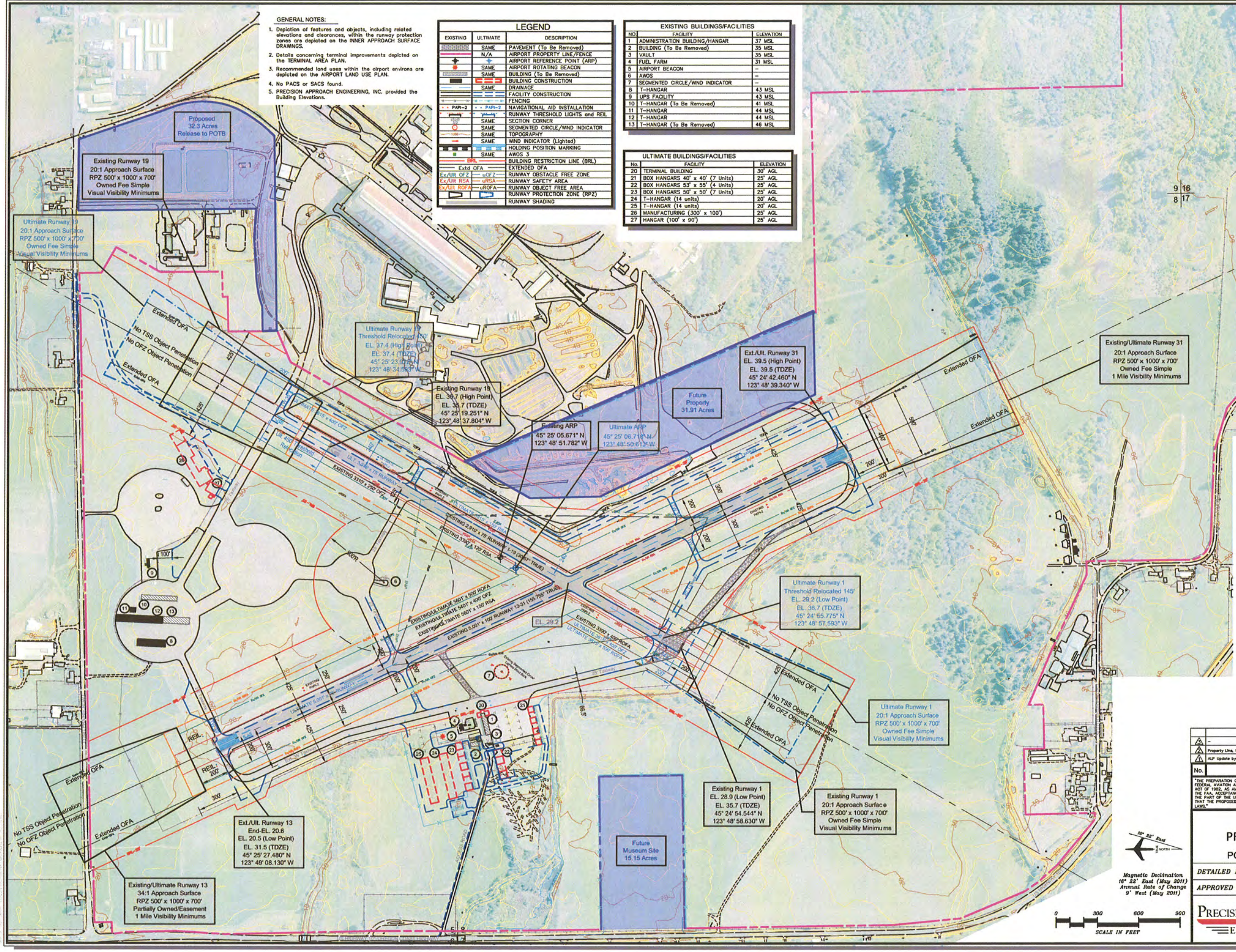
EXISTING	ULTIMATE	DESCRIPTION
	SAME	PAVEMENT (To Be Removed)
	N/A	AIRPORT PROPERTY LINE/FENCE
		AIRPORT REFERENCE POINT (ARP)
	SAME	AIRPORT ROTATING BEACON
	SAME	BUILDING (To Be Removed)
		BUILDING CONSTRUCTION
	SAME	DRAINAGE
		FACILITY CONSTRUCTION
		FENCING
PAPI-2	PAPI-2	NAVIGATIONAL AID INSTALLATION
		RUNWAY THRESHOLD LIGHTS and REIL
	SAME	SECTION CORNER
	SAME	SEGMENTED CIRCLE/WIND INDICATOR
	SAME	TOPOGRAPHY
	SAME	WIND INDICATOR (Lighted)
		HOLDING POSITION MARKING
	SAME	AWOS 3
BRL		BUILDING RESTRICTION LINE (BRL)
Extd OFA		EXTENDED OFA
Ex/Ult OFZ	uOFZ	RUNWAY OBSTACLE FREE ZONE
Ex/Ult RSA	uRSA	RUNWAY SAFETY AREA
Ex/Ult ROFA	uROFA	RUNWAY OBJECT FREE AREA
		RUNWAY PROTECTION ZONE (RPZ)
		RUNWAY SHADING

EXISTING BUILDINGS/FACILITIES

NO.	FACILITY	ELEVATION
1	ADMINISTRATION BUILDING/HANGAR	37 MSL
2	BUILDING (To Be Removed)	35 MSL
3	VAULT	35 MSL
4	FUEL FARM	31 MSL
5	AIRPORT BEACON	–
6	AWOS	–
7	SEGMENTED CIRCLE/WIND INDICATOR	–
8	T-HANGAR	43 MSL
9	UPS FACILITY	43 MSL
10	T-HANGAR (To Be Removed)	41 MSL
11	T-HANGAR	44 MSL
12	T-HANGAR	44 MSL
13	T-HANGAR (To Be Removed)	46 MSL

ULTIMATE BUILDINGS/FACILITIES

No.	FACILITY	ELEVATION
20	TERMINAL BUILDING	30' AGL
21	BOX HANGARS 40' x 40' (7 Units)	25' AGL
22	BOX HANGARS 53' x 55' (4 Units)	25' AGL
23	BOX HANGARS 50' x 50' (7 Units)	25' AGL
24	T-HANGAR (14 units)	20' AGL
25	T-HANGAR (14 units)	20' AGL
26	MANUFACTURING (300' x 100')	25' AGL
27	HANGAR (100' x 90')	25' AGL



FAA APPROVAL STAMP

FOR APPROVAL BY:
Port of Tillamook Bay

Michele Bradley
General Manager
DATE:

Magnetic Declination
16° 22' East (May 2011)
Annual Rate of Change
9' West (May 2011)

0 300 600 900
SCALE IN FEET

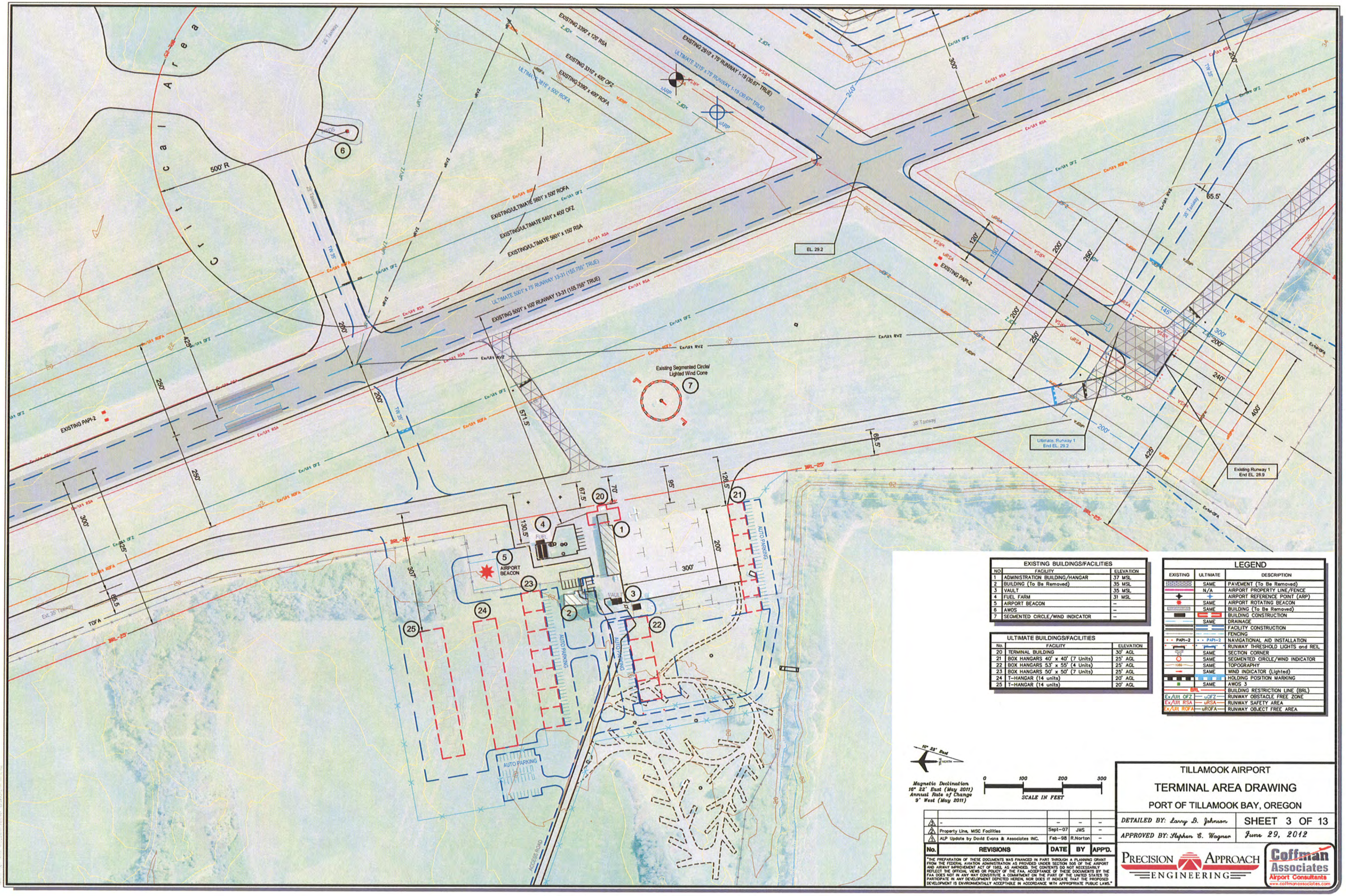
No.	REVISIONS	DATE	BY	APP'D.
3	–	–	–	–
2	Property Line, MISC Facilities	Sept-07	JWS	–
1	ALP Update by David Evans & Associates INC.	Feb-98	R.Norton	–

"THE PREPARATION OF THESE DOCUMENTS WAS FINANCED IN PART THROUGH A PLANNING GRANT FROM THE FEDERAL AVIATION ADMINISTRATION AS PROVIDED UNDER SECTION 505 OF THE AIRPORT AND AIRWAY IMPROVEMENT ACT OF 1982, AS AMENDED. THE CONTENTS DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THESE DOCUMENTS BY THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATE IN ANY DEVELOPMENT DEPICTED HEREIN, NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE IN ACCORDANCE WITH APPROPRIATE PUBLIC LAWS."

TILLAMOOK AIRPORT
PROPOSED LAND USE DRAWING
PORT OF TILLAMOOK BAY, OREGON

DETAILED BY: Larry B. Johnson | SHEET 2A OF 13
APPROVED BY: Stephen C. Wagner | June 29, 2012

PRECISION APPROACH ENGINEERING
Coffman Associates Airport Consultants www.coffmanassociates.com



EXISTING BUILDINGS/FACILITIES		
NO.	FACILITY	ELEVATION
1	ADMINISTRATION BUILDING/HANGAR	37 MSL
2	BUILDING (To Be Removed)	35 MSL
3	VAULT	35 MSL
4	FUEL FARM	31 MSL
5	AIRPORT BEACON	–
6	AWOS	–
7	SEGMENTED CIRCLE/WIND INDICATOR	–

ULTIMATE BUILDINGS/FACILITIES		
No.	FACILITY	ELEVATION
20	TERMINAL BUILDING	30' AGL
21	BOX HANGARS 40' x 40' (7 Units)	25' AGL
22	BOX HANGARS 53' x 55' (4 Units)	25' AGL
23	BOX HANGARS 50' x 50' (7 Units)	25' AGL
24	T-HANGAR (14 units)	20' AGL
25	T-HANGAR (14 units)	20' AGL

LEGEND

EXISTING	ULTIMATE	DESCRIPTION
	SAME	PAVEMENT (To Be Removed)
	N/A	AIRPORT PROPERTY LINE/FENCE
		AIRPORT REFERENCE POINT (ARP)
	SAME	AIRPORT ROTATING BEACON
	SAME	BUILDING (To Be Removed)
		BUILDING CONSTRUCTION
	SAME	DRAINAGE
		FACILITY CONSTRUCTION
		FENCING
PAPI-2	PAPI-2	NAVIGATIONAL AID INSTALLATION
		RUNWAY THRESHOLD LIGHTS and REIL
	SAME	SECTION CORNER
	SAME	SEGMENTED CIRCLE/WIND INDICATOR
1080	SAME	TOPOGRAPHY
	SAME	WIND INDICATOR (Lighted)
		HOLDING POSITION MARKING
	SAME	AWOS 3
BRL		BUILDING RESTRICTION LINE (BRL)
Ex/Ult OFZ	uOFZ	RUNWAY OBSTACLE FREE ZONE
Ex/Ult RSA	uRSA	RUNWAY SAFETY AREA
Ex/Ult ROFA	uROFA	RUNWAY OBJECT FREE AREA

16° 22' East
TRUE NORTH

Magnetic Declination
16° 22' East (May 2011)
Annual Rate of Change
9' West (May 2011)

0 100 200 300
SCALE IN FEET

No.	REVISIONS	DATE	BY	APP'D.
3	-	–	–	–
2	Property Line, MISC Facilities	Sept–07	JWS	–
1	ALP Update by David Evans & Associates INC.	Feb–98	R.Norton	–

"THE PREPARATION OF THESE DOCUMENTS WAS FINANCED IN PART THROUGH A PLANNING GRANT FROM THE FEDERAL AVIATION ADMINISTRATION AS PROVIDED UNDER SECTION 505 OF THE AIRPORT AND AIRWAY IMPROVEMENT ACT OF 1982, AS AMENDED. THE CONTENTS DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THESE DOCUMENTS BY THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATE IN ANY DEVELOPMENT DEPICTED HEREIN, NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE IN ACCORDANCE WITH APPROPRIATE PUBLIC LAWS."

TILLAMOOK AIRPORT

TERMINAL AREA DRAWING

PORT OF TILLAMOOK BAY, OREGON

DETAILED BY: Larry D. Johnson — SHEET 3 OF 13

APPROVED BY: Stephen C. Wagner — June 29, 2012

PRECISION APPROACH ENGINEERING

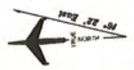
Coffman Associates Airport Consultants www.coffmanassociates.com

LEGEND:

EXISTING PROPERTY LINE

ULTIMATE RPZ

EXISTING RPZ



Magnetic Declination
16° 22' East (May 2011)
Annual Rate of Change
00° 09' West (May 2011)

0 400 800 1200
SCALE IN FEET

No.	REVISIONS	DATE	BY	APP'D.
3	-	-	-	-
2	Property Line, MISC Facilities	Sept-07	JWS	-
1	ALP Update by David Evans & Associates INC.	Feb-98	R.Norton	-

"THE PREPARATION OF THESE DOCUMENTS WAS FINANCED IN PART THROUGH A PLANNING GRANT FROM THE FEDERAL AVIATION ADMINISTRATION AS PROVIDED UNDER SECTION 505 OF THE AIRPORT AND AIRWAY IMPROVEMENT ACT OF 1982, AS AMENDED. THE CONTENTS DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THESE DOCUMENTS BY THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATE IN ANY DEVELOPMENT DEPICTED HEREIN, NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE IN ACCORDANCE WITH APPROPRIATE PUBLIC LAWS."

TILLAMOOK AIRPORT

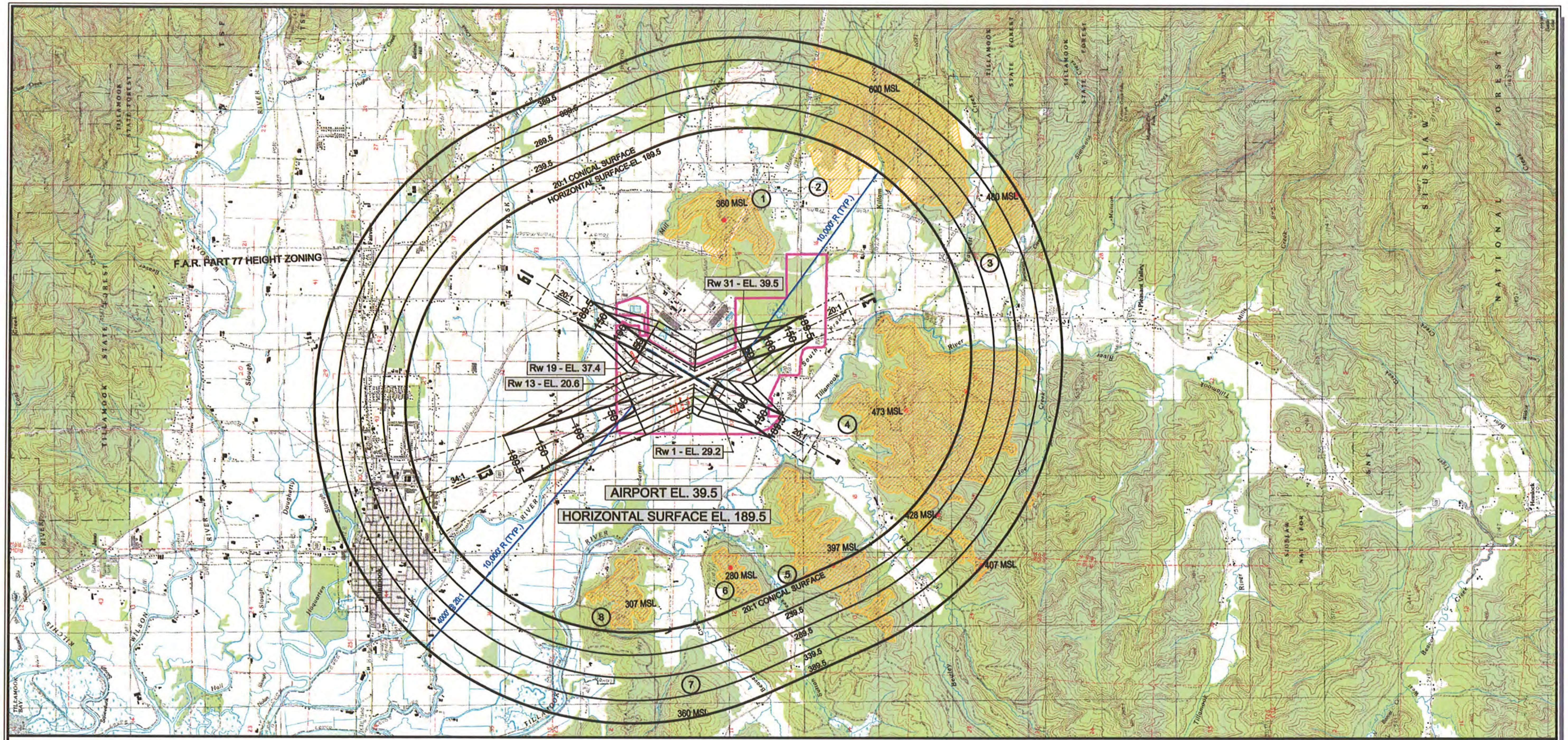
AIERIAL PHOTO

PORT OF TILLAMOOK BAY, OREGON

DETAILED BY: *Larry D. Johnson*	SHEET 4 OF 13
APPROVED BY: *Stephen C. Wagner*	*June 29, 2012*

PRECISION APPROACH ENGINEERING

Coffman Associates
Airport Consultants
www.coffmanassociates.com



16° 6' East

TRUE NORTH

Magnetic Declination
16° 22' East (May 2011)
Annual Rate of Change 9' West

0 2000 4000 6000
SCALE IN FEET

OBSTRUCTION TABLE				
Description/Elevation	Obstructed Part 77 Surface	Surface Elevation	Object Penetration	Proposed Object Disposition
1. TERRAIN EL 360	Horizontal Surface	189.5 MSL	170'	Request Aeronautical Study
2. TERRAIN EL 400 (UP TO 600 MSL)	Horizontal Surface Conical Surface	189.5 MSL 370.0 MSL	210.5' 230'	Request Aeronautical Study
3. TERRAIN EL 480	Conical Surface	390 MSL	90'	Request Aeronautical Study
4. TERRAIN EL 473	Horizontal Surface Conical Surface	189.5 MSL 190 MSL	283.5 250'	Request Aeronautical Study
5. TERRAIN EL 397	Conical Surface	189.5 MSL	207.5'	Request Aeronautical Study
6. TERRAIN EL 280	Horizontal Surface	189.5 MSL	90.5	Request Aeronautical Study
7. TERRAIN EL 360	Conical Surface	340 MSL	20'	Request Aeronautical Study
8. TERRAIN EL 307	Horizontal Surface Conical Surface	189.5 MSL	117.5'	Request Aeronautical Study

OBSTRUCTION LEGEND

- OBSTRUCTION
- TOPOGRAPHIC OBSTRUCTION

GENERAL NOTES:

1. Obstructions, clearances, and locations are calculated from ultimate runway end elevations and ultimate approach surfaces, unless otherwise noted. Road obstructions reflect a safety clearance of 10' for dirt Roads or private Roads, 15' for noninterstate Roads, 17' for interstate Roads, and 23' for railroad.
2. Depiction of features and objects within the primary, transitional, and horizontal Part 77 surfaces, is illustrated on the AIRPORT AIRSPACE DRAWINGS.
3. Depiction of features and objects within the outer portion of the approach surfaces, is illustrated on the APPROACH SURFACE PROFILES.
4. Depiction of features and objects within the inner portion of the approach surfaces, is illustrated on the INNER PORTION OF THE RUNWAY APPROACH SURFACE DRAWINGS.

No.	REVISIONS	DATE	BY	APP'D.
3	-	-	-	-
2	Property Line, MISC Facilities	Sept-07	JWS	-
1	ALP Update by David Evans & Associates INC.	Feb-98	R.Norton	-

"THE PREPARATION OF THESE DOCUMENTS WAS FINANCED IN PART THROUGH A PLANNING GRANT FROM THE FEDERAL AVIATION ADMINISTRATION AS PROVIDED UNDER SECTION 505 OF THE AIRPORT AND AIRWAY IMPROVEMENT ACT OF 1982, AS AMENDED. THE CONTENTS DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THESE DOCUMENTS BY THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATE IN ANY DEVELOPMENT DEPICTED HEREIN, NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE IN ACCORDANCE WITH APPROPRIATE PUBLIC LAWS."

TILLAMOOK AIRPORT

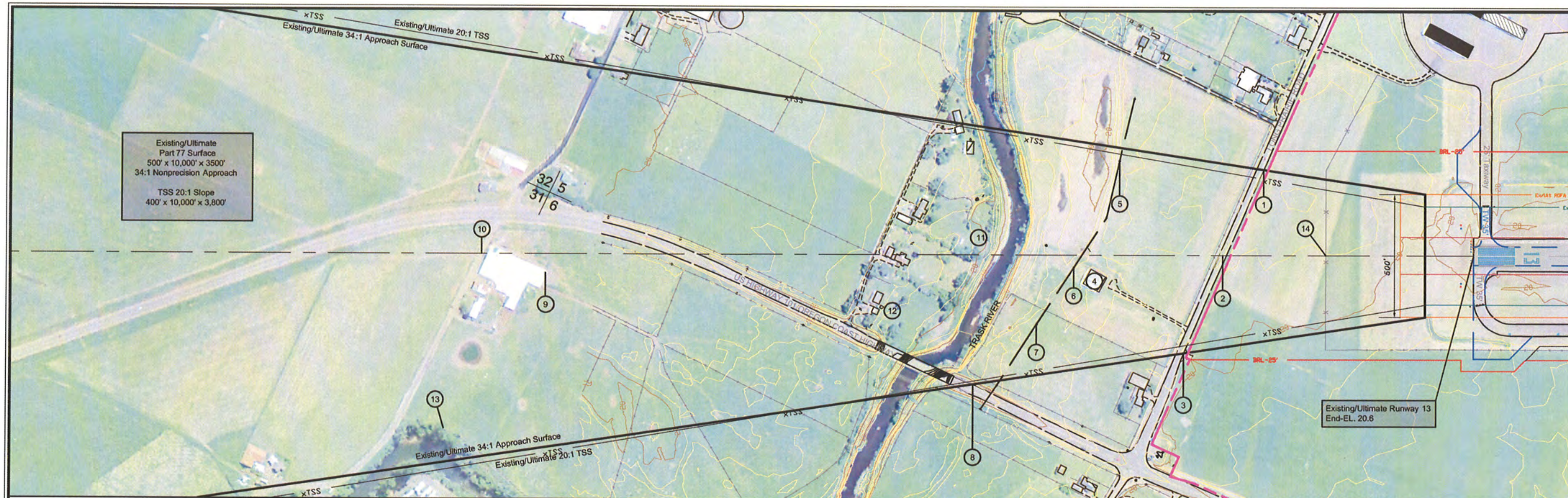
AIRPORT AIRSPACE DRAWING

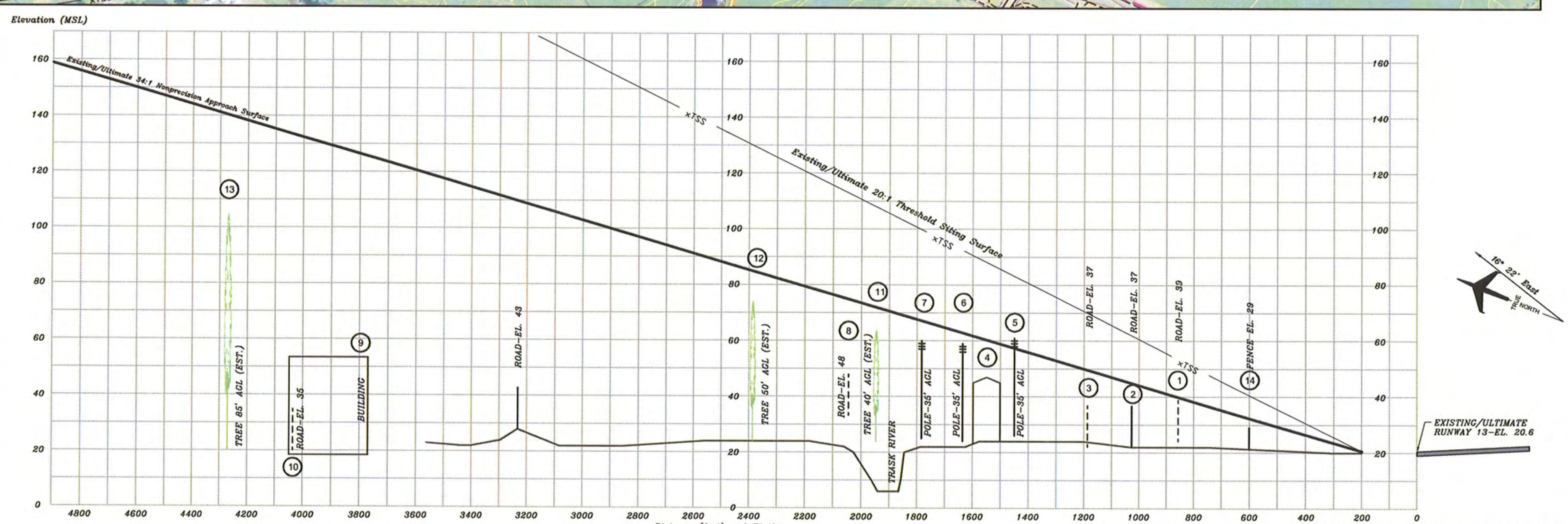
PORT OF TILLAMOOK BAY, OREGON

DETAILED BY: Larry D. Johnson	SHEET 5 OF 13
APPROVED BY: Stephen C. Wagner	June 29, 2012

PRECISION APPROACH ENGINEERING

Coffman Associates Airport Consultants www.coffmanassociates.com





OBSTRUCTION TABLE				
Runway 13 Object Description/Elevation	Obstructed Part 77 Surface	Object Penetration	TSS 20:1 Penetration	Proposed Object Disposition
5. POWER POLES	34:1 Approach	4'	0'	Add Obstruction Light
– –	–	–	–	–
– –	–	–	–	–
– –	–	–	–	–

GENERAL NOTES:

1. Obstructions, clearances, and locations are calculated from ultimate runway end elevations and ultimate approach surfaces, unless otherwise noted. Road obstructions reflect a safety clearance of 10' for dirt Roads or private Roads, 15' for noninterstate Roads, 17' for interstate Roads, and 23' for railroad.

Magnetic Declination
16° 22' East (May 2011)
Annual Rate of Change 9' West

0 20 40 60
VERTICAL SCALE IN FEET

0 200 400 600
HORIZONTAL SCALE IN FEET

No.	REVISIONS	DATE	BY	APP'D.
3	–	–	–	–
2	Property Line, MISC Facilities	Sept–07	JWS	–
1	ALP Update by David Evans & Associates INC.	Feb–98	R.Norton	–

"THE PREPARATION OF THESE DOCUMENTS WAS FINANCED IN PART THROUGH A PLANNING GRANT FROM THE FEDERAL AVIATION ADMINISTRATION AS PROVIDED UNDER SECTION 505 OF THE AIRPORT AND AIRWAY IMPROVEMENT ACT OF 1982, AS AMENDED. THE CONTENTS DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THESE DOCUMENTS BY THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATE IN ANY DEVELOPMENT DEPICTED HEREIN, NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE IN ACCORDANCE WITH APPROPRIATE PUBLIC LAWS."

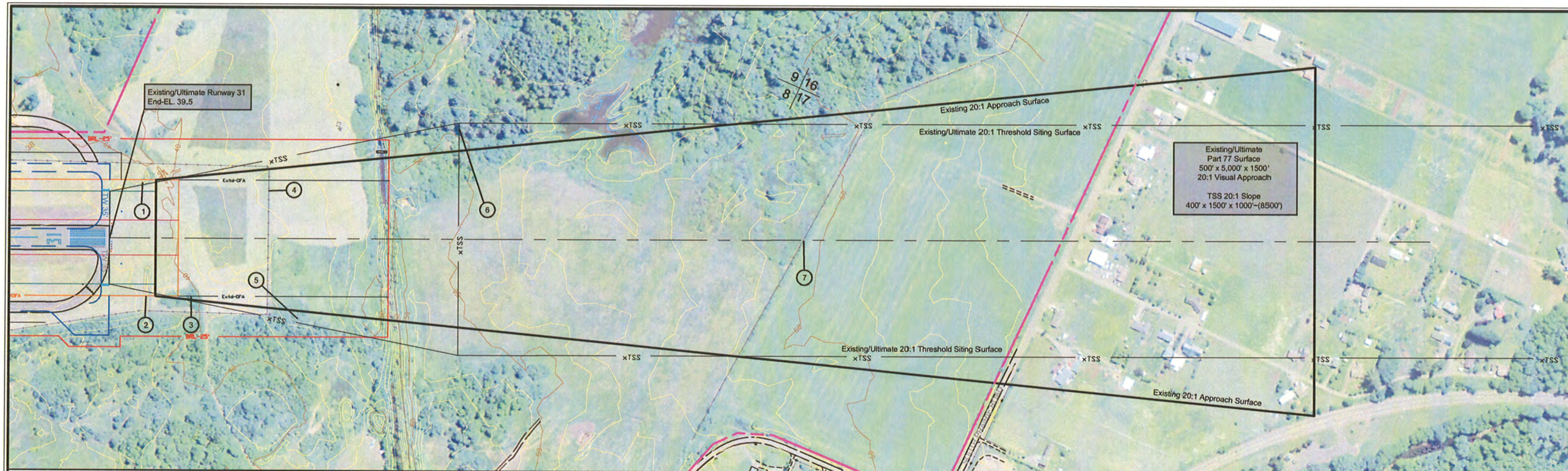
TILLAMOOK AIRPORT
INNER PORTION OF RUNWAY 13
APPROACH SURFACE DRAWING
PORT OF TILLAMOOK BAY, OREGON

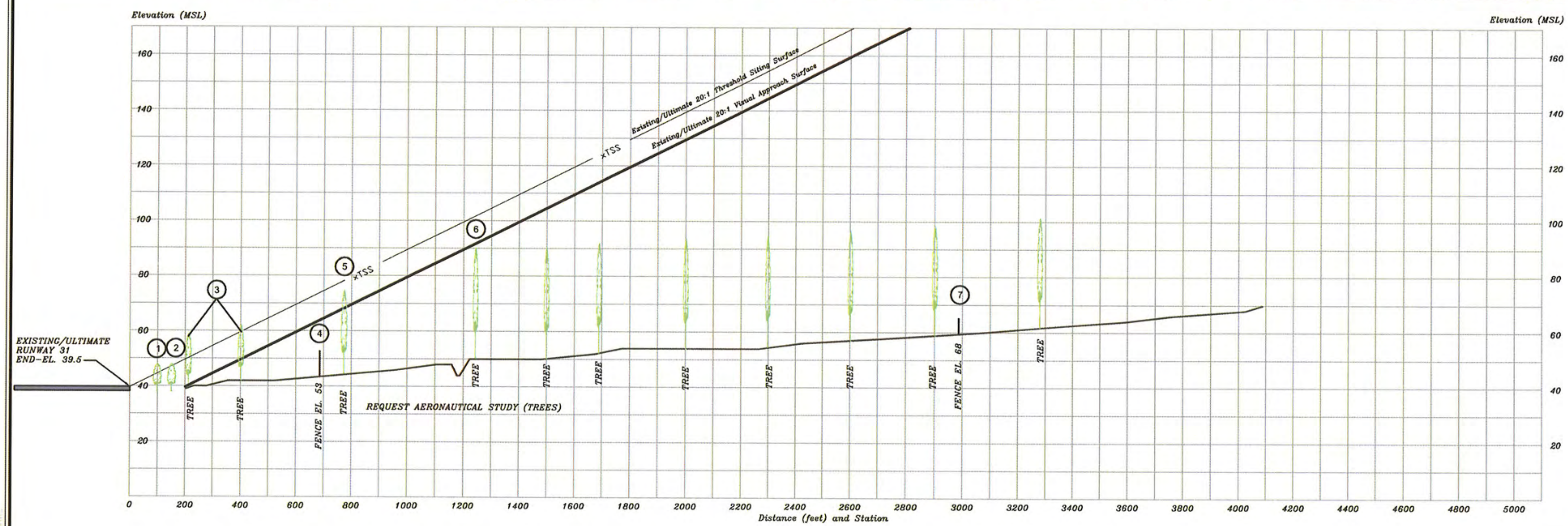
DETAILED BY: Larry D. Johnson
APPROVED BY: Stephen C. Wagner

June 29, 2012

PRECISION APPROACH ENGINEERING

Coffman Associates
Airport Consultants
www.coffmanassociates.com





OBSTRUCTION TABLE

Runway 31 Object Description/Elevation	Obstructed Part 77 Surface	Object Penetration	TSS 20:1 Penetration	Proposed Object Disposition
1. Brush EL. 48	20:1 Approach	8.5'	0'	Remove Brush/Trees
2. Brush EL. 48	20:1 Approach	8.5'	0'	Remove Brush/Trees
3. Trees	–	–	–	Remove Trees
5. Trees	–	–	–	Remove Trees
6. Trees	–	–	–	Request Aeronautical Study

GENERAL NOTES:

1. Obstructions, clearances, and locations are calculated from ultimate runway end elevations and ultimate approach surfaces, unless otherwise noted. Road obstructions reflect a safety clearance of 10' for dirt Roads or private Roads, 15' for noninterstate Roads, 17' for interstate Roads, and 23' for railroad.

Magnetic Declination
16° 22' East (May 2011)
Annual Rate of Change
9' West (May 2011)

16° 22' East
TRUE NORTH

VERTICAL SCALE IN FEET: 0 20 40 60

HORIZONTAL SCALE IN FEET: 0 200 400 600

No.	REVISIONS	DATE	BY	APP'D.
3	-	–	–	–
2	Property Line, MISC Facilities	Sept–07	JWS	–
1	ALP Update by David Evans & Associates INC.	Feb–98	R.Norton	–

"THE PREPARATION OF THESE DOCUMENTS WAS FINANCED IN PART THROUGH A PLANNING GRANT FROM THE FEDERAL AVIATION ADMINISTRATION AS PROVIDED UNDER SECTION 505 OF THE AIRPORT AND AIRWAY IMPROVEMENT ACT OF 1982, AS AMENDED. THE CONTENTS DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THESE DOCUMENTS BY THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATE IN ANY DEVELOPMENT DEPICTED HEREIN, NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE IN ACCORDANCE WITH APPROPRIATE PUBLIC LAWS."

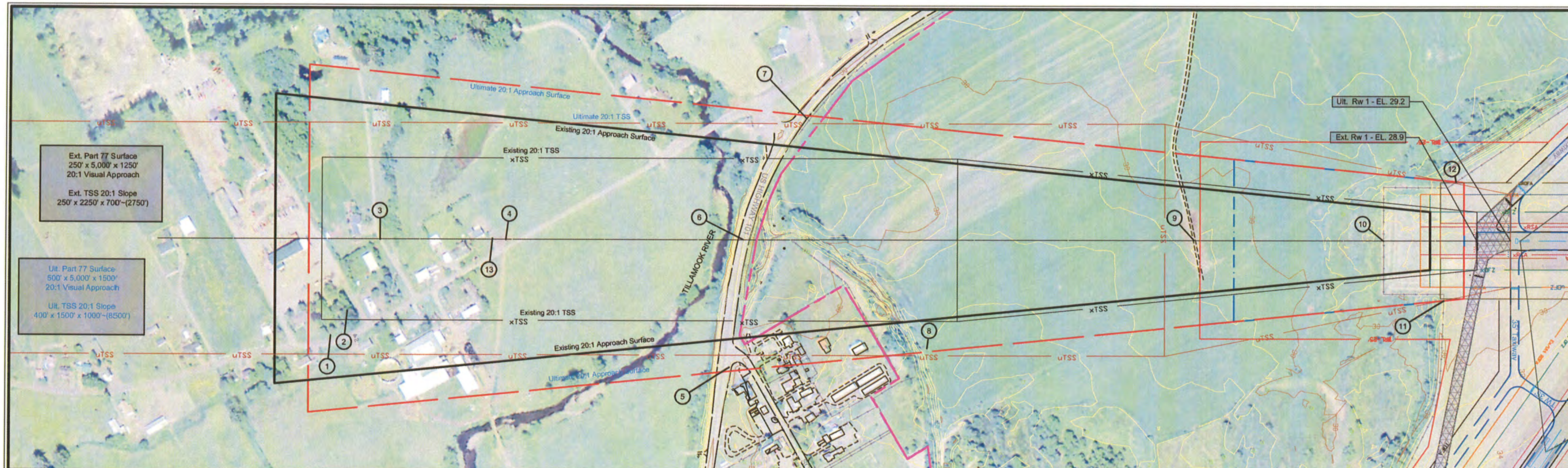
TILLAMOOK AIRPORT
INNER PORTION OF RUNWAY 31
APPROACH SURFACE DRAWING
PORT OF TILLAMOOK BAY, OREGON

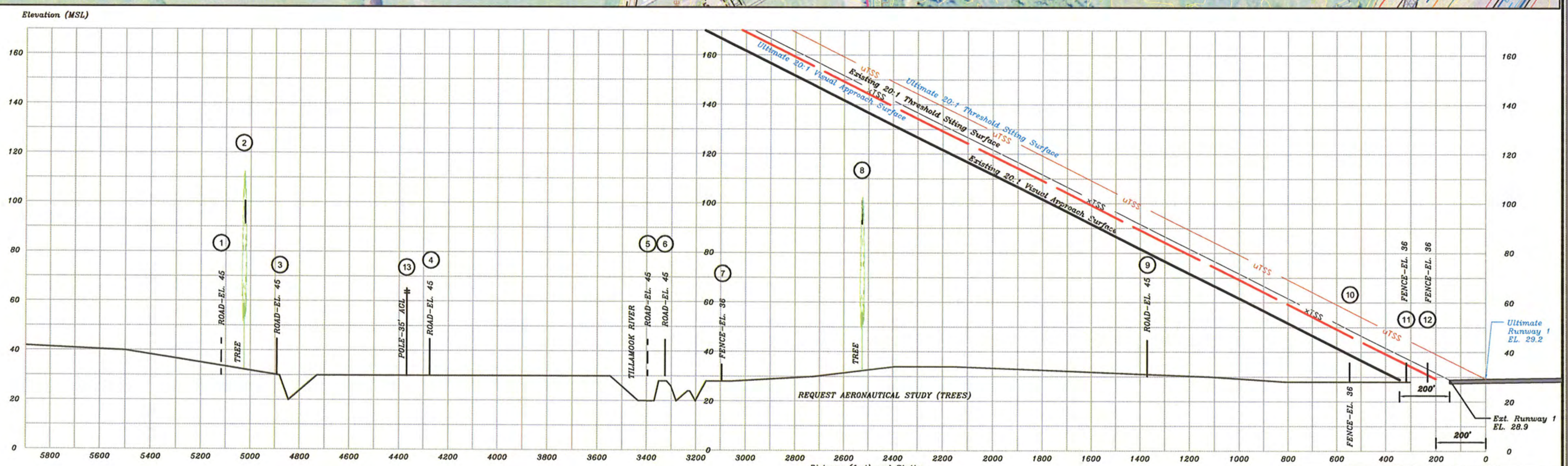
DETAILED BY: Larry B. Johnson | SHEET 7 OF 13

APPROVED BY: Stephen B. Wagner | June 29, 2012

PRECISION APPROACH ENGINEERING

Coffman Associates
Airport Consultants
www.coffmanassociates.com





OBSTRUCTION TABLE

Runway 1 Object Description/Elevation	Obstructed Part 77 Surface	Object Penetration	TSS 20:1 Penetration	Proposed Object Disposition
11. FENCE EL 36	20:1 APPROACH	5'	0'	RELOCATE FENCE
12. FENCE EL 36	20:1 APPROACH	5'	0'	RELOCATE FENCE

GENERAL NOTES:

1. Obstructions, clearances, and locations are calculated from ultimate runway end elevations and ultimate approach surfaces, unless otherwise noted. Road obstructions reflect a safety clearance of 10' for dirt Roads or private Roads, 15' for noninterstate Roads, 17' for interstate Roads, and 23' for railroad.

TRUE NORTH
16° 22' East

Magnetic Declination
16° 22' East (May 2011)
Annual Rate of Change
9' West (May 2011)

0 20 40 60
VERTICAL SCALE IN FEET

0 200 400 600
HORIZONTAL SCALE IN FEET

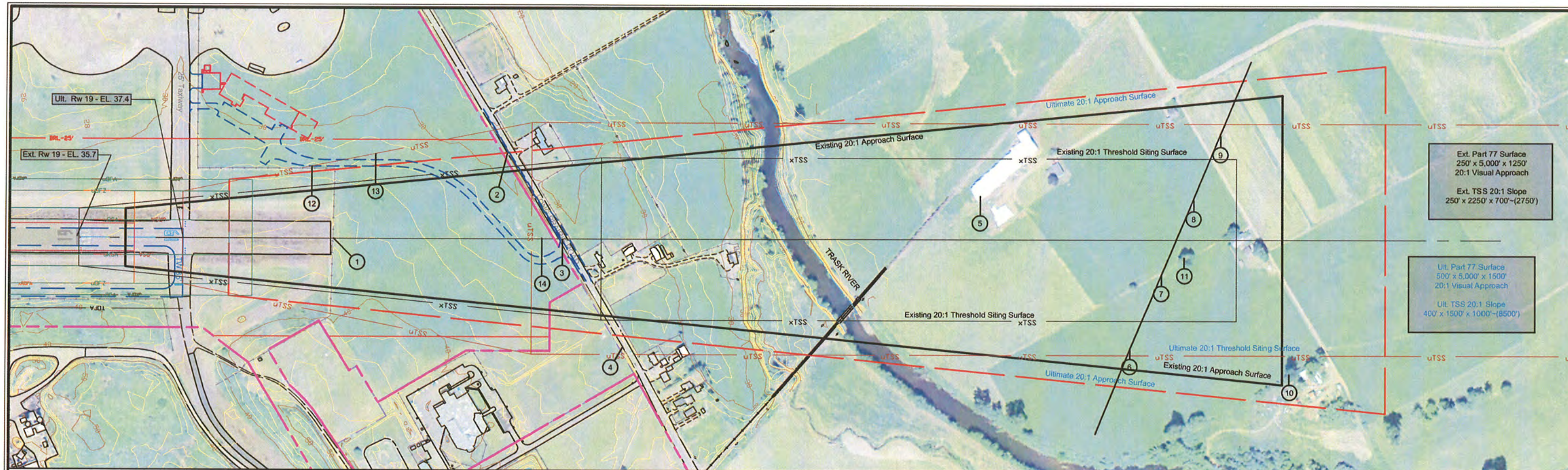
No.	REVISIONS	DATE	BY	APP'D.
3	-	-	-	-
2	Property Line, MISC Facilities	Sept-07	JWS	-
1	ALP Update by David Evans & Associates INC.	Feb-98	R.Norton	-

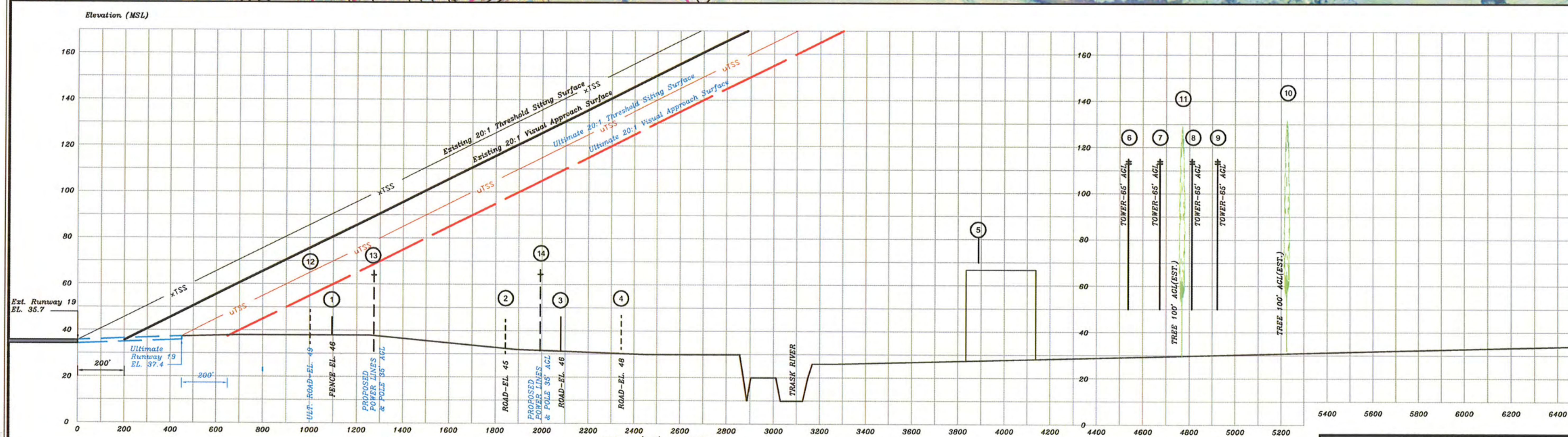
"THE PREPARATION OF THESE DOCUMENTS WAS FINANCED IN PART THROUGH A PLANNING GRANT FROM THE FEDERAL AVIATION ADMINISTRATION AS PROVIDED UNDER SECTION 505 OF THE AIRPORT AND AIRWAY IMPROVEMENT ACT OF 1982, AS AMENDED. THE CONTENTS DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THESE DOCUMENTS BY THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATE IN ANY DEVELOPMENT DEPICTED HEREIN, NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE IN ACCORDANCE WITH APPROPRIATE PUBLIC LAWS."

TILLAMOOK AIRPORT
INNER PORTION OF RUNWAY 1
APPROACH SURFACE DRAWING
PORT OF TILLAMOOK BAY, OREGON

DETAILED BY: Larry D. Johnson — SHEET 8 OF 13
APPROVED BY: Stephen C. Wagner — June 29, 2012

PRECISION APPROACH ENGINEERING
Coffman Associates Airport Consultants
www.coffmanassociates.com





OBSTRUCTION TABLE

Runway 19 Object Description/Elevation	Obstructed Part 77 Surface	Object Penetration	TSS 20:1 Penetration	Proposed Object Disposition
None	–	–	–	–

GENERAL NOTES:

1. Obstructions, clearances, and locations are calculated from ultimate runway end elevations and ultimate approach surfaces, unless otherwise noted. Road obstructions reflect a safety clearance of 10' for dirt Roads or private Roads, 15' for noninterstate Roads, 17' for interstate Roads, and 23' for railroad.

TRUE NORTH
16° 22' East

Magnetic Declination
16° 22' East (May 2011)
Annual Rate of Change
9' West (May 2011)

0 20 40 60
VERTICAL SCALE IN FEET

0 200 400 600
HORIZONTAL SCALE IN FEET

No.	REVISIONS	DATE	BY	APP'D.
3	-	–	–	–
2	Property Line, MISC Facilities	Sept–07	JWS	–
1	ALP Update by David Evans & Associates INC.	Feb–98	R.Norton	–

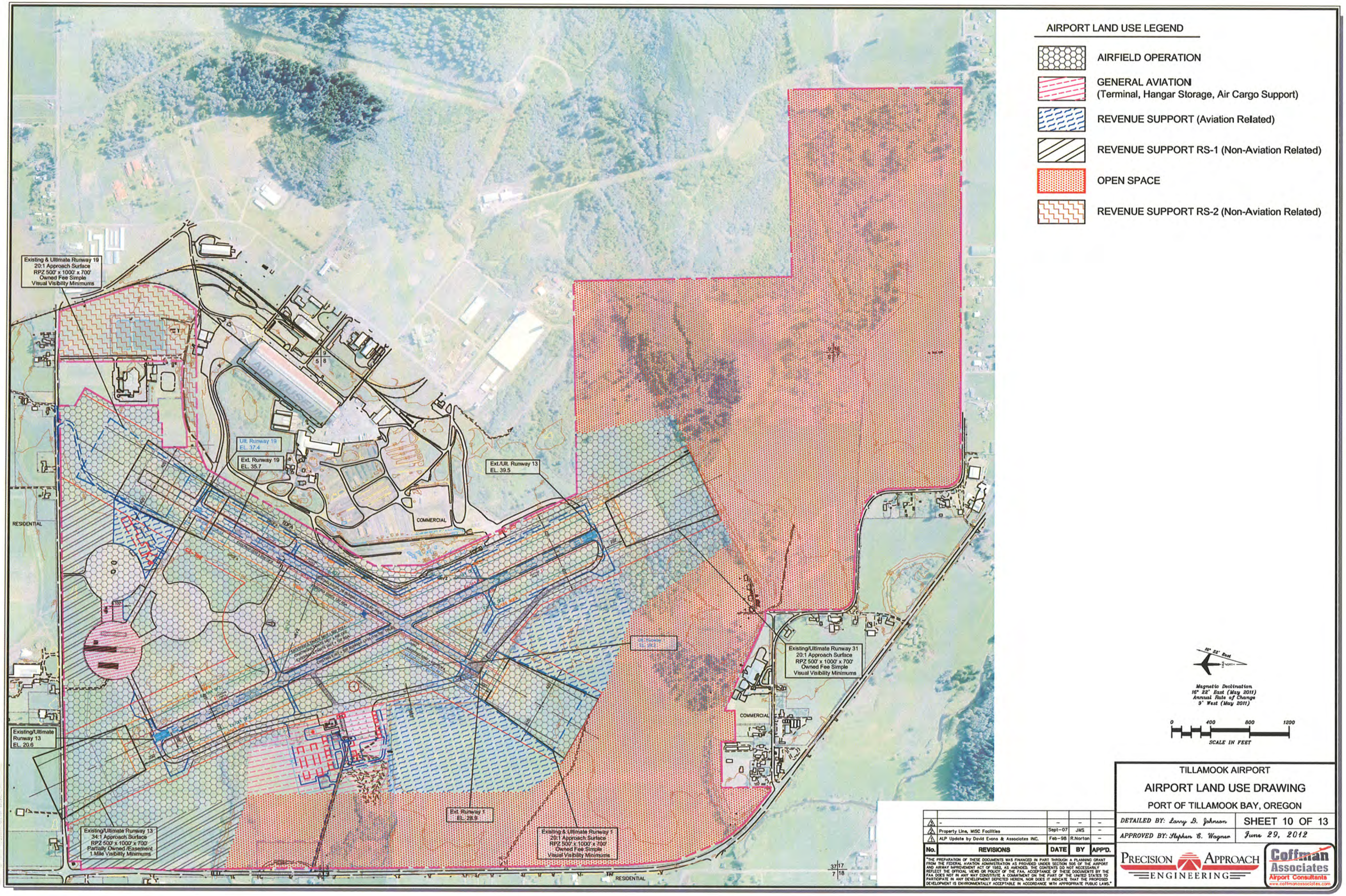
"THE PREPARATION OF THESE DOCUMENTS WAS FINANCED IN PART THROUGH A PLANNING GRANT FROM THE FEDERAL AVIATION ADMINISTRATION AS PROVIDED UNDER SECTION 505 OF THE AIRPORT AND AIRWAY IMPROVEMENT ACT OF 1982, AS AMENDED. THE CONTENTS DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THESE DOCUMENTS BY THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATE IN ANY DEVELOPMENT DEPICTED HEREIN, NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE IN ACCORDANCE WITH APPROPRIATE PUBLIC LAWS."

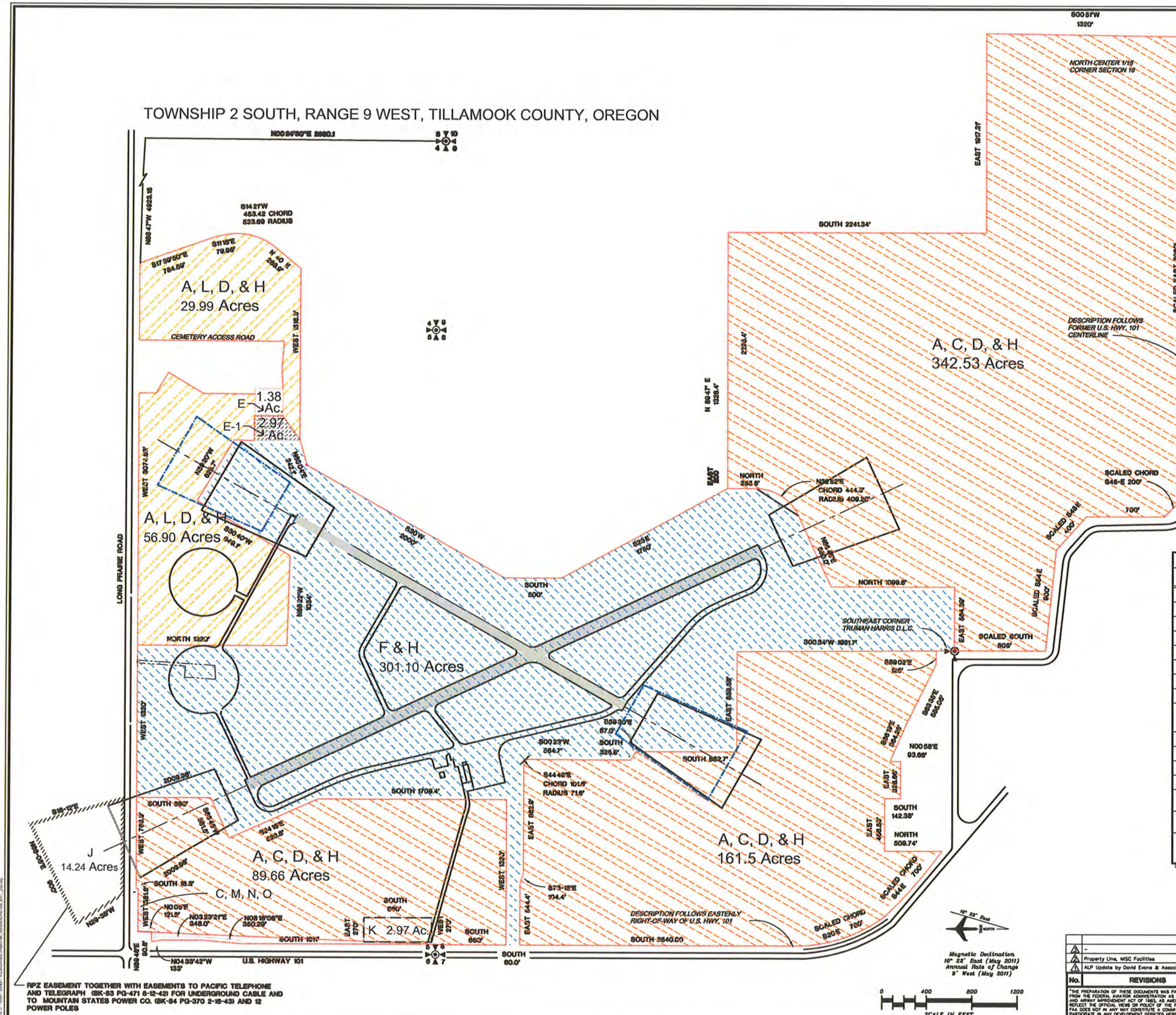
TILLAMOOK AIRPORT
INNER PORTION OF RUNWAY 19
APPROACH SURFACE DRAWING
PORT OF TILLAMOOK BAY, OREGON

DETAILED BY: Larry D. Johnson
APPROVED BY: Stephen E. Wagner

SHEET 9 OF 13
June 29, 2012

PRECISION APPROACH ENGINEERING
Coffman Associates Airport Consultants
www.coffmanassociates.com


AIRPORT LAND USE LEGEND
AIRFIELD OPERATION
GENERAL AVIATION
(Terminal, Hangar Storage, Air Cargo Support)
REVENUE SUPPORT (Aviation Related)
REVENUE SUPPORT RS-1 (Non-Aviation Related)
OPEN SPACE
REVENUE SUPPORT RS-2 (Non-Aviation Related)
Existing & Ultimate Runway 19
20:1 Approach Surface
RPZ 500' x 1000' x 700'
Owned Fee Simple
Visual Visibility Minimums
AIR MUSEUM
Ult. Runway 19
EL. 37.4
Ext. Runway 19
EL. 35.7
Ext./Ult. Runway 13
EL. 39.5
COMMERCIAL
RESIDENTIAL
Existing/Ultimate Runway 31
20:1 Approach Surface
RPZ 500' x 1000' x 700'
Owned Fee Simple
Visual Visibility Minimums
COMMERCIAL
Existing/Ultimate
Runway 13
EL. 20.6
Existing/Ultimate Runway 13
34:1 Approach Surface
RPZ 500' x 1000' x 700'
Partially Owned /Easement
1 Mile Visibility Minimums
Ext. Runway 1
EL. 28.9
Existing & Ultimate Runway 1
20:1 Approach Surface
RPZ 500' x 1000' x 700'
Owned Fee Simple
Visual Visibility Minimums
RESIDENTIAL
16° 22' East
TRUE NORTH
Magnetic Declination
16° 22' East (May 2011)
Annual Rate of Change
9' West (May 2011)
0 400 800 1200
SCALE IN FEET
TILLAMOOK AIRPORT
AIRPORT LAND USE DRAWING
PORT OF TILLAMOOK BAY, OREGON
DETAILED BY: Larry D. Johnson
SHEET 10 OF 13
APPROVED BY: Stephen C. Wagner
June 29, 2012
3 - - - -
2 Property Line, MISC Facilities Sept-07 JWS -
1 ALP Update by David Evans & Associates INC. Feb-98 R.Norton -
No. REVISIONS DATE BY APP'D.
"THE PREPARATION OF THESE DOCUMENTS WAS FINANCED IN PART THROUGH A PLANNING GRANT FROM THE FEDERAL AVIATION ADMINISTRATION AS PROVIDED UNDER SECTION 505 OF THE AIRPORT AND AIRWAY IMPROVEMENT ACT OF 1982, AS AMENDED. THE CONTENTS DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THESE DOCUMENTS BY THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATE IN ANY DEVELOPMENT DEPICTED HEREIN, NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE IN ACCORDANCE WITH APPROPRIATE PUBLIC LAWS."
PRECISION APPROACH
ENGINEERING
Coffman Associates
Airport Consultants
www.coffmanassociates.com



Source: DAVID EVANS and ASSOCIATES

DISTANCES AND BEARINGS SHOWN ARE BASED ON AVAILABLE RECORDS AND HAVE NOT BEEN FIELD VERIFIED UPDATED 8/07.

IT IS BELIEVED THAT THE PARCELS DEPICTED REPRESENT APPROXIMATE LEGAL BOUNDARIES, HOWEVER, SEVERAL SIGNIFICANT GEOMETRIC CLOSURE ERRORS WERE IDENTIFIED DURING THE PREPARATION OF THIS EXHIBIT.

AIRPORT PROPERTY

PARCEL	GRANTOR/GRANTEE	PROPERTY INTEREST	DATE ACQUIRED	BOOK/PAGE	FEDERAL PROJECT NUMBER
A	U.S. GOVERNMENT	QUITCLAIM TRANSFERRING TITLE TILLAMOOK COUNTY	10-27-64	BK-197/PG-512	N/A
B	U.S. GOVERNMENT	QUITCLAIM TRANSFERRING TITLE TILLAMOOK COUNTY	10-21-66	BK-204/PAGE 258	N/A
C	TILLAMOOK COUNTY	DEED TRANSFERRING TITLE TO PORT OF TILLAMOOK BAY	2-3-67	BK-205/PAGE 435	N/A
D	U.S. GOVERNMENT	RELEASE FROM EMERGENCY SEIZURE CLAUSE	4-12-68	BK-211/PAGE 925	-
E	TILLAMOOK COUNTY	RELEASE FOR CEMETERY EXPANSION	11-2-78	BK-260/PAGE 39	-
E1	TILLAMOOK COUNTY	DEED TRANSFERRING TITLE TO SACRED HEART CEMETERY	7-25-71	BK-36/PAGE 125	-
F	TILLAMOOK COUNTY	QUITCLAIM TRANSFERRING TITLE TO PORT OF TILLAMOOK BAY	8-22-79	BK-264/PAGE 769	-
G	TILLAMOOK COUNTY	QUITCLAIM TRANSFERRING TITLE TO PORT OF TILLAMOOK BAY	8-22-79	BK-264/PAGE 770	-
H	U.S. GOVERNMENT & PORT OF TILLAMOOK BAY	REVENUE DESIGNATED FOR AIRPORT	11-21-79	BK-266/PAGE 946	- -
I	U.S. GOVERNMENT & PORT OF TILLAMOOK BAY	RPZ EASEMENT	5-22-79	BK-263/PAGE 359	-
J	TILLAMOOK COUNTY	PARCEL FOR NEW CORRECTIONS FACILITY	1-23-96	BK-375/PAGE 624	-
K	U.S. FOREST SERVICE	DEED TRANSFERRING TITLE TO PORT OF TILLAMOOK BAY	12-97	UNAVAILABLE	-
L	FAA	DEED OF RELEASE TO PORT OF TILLAMOOK BAY	4-26-07	FILE: 2007-003434	-
M	PORT OF TILLAMOOK BAY	WARRANTY DEED TRANSFERING TITLE TO OREGON DEPARTMENT OF TRANSPORTATION	4-26-07	FILE: 2007-003435	-
N	GARY ABBOTT	QUITCLAIM DEED OF RIGHTS, TITLE AND INTEREST TO OREGON DEPARTMENT OF TRANSPORTATION	4-26-07	FILE: 2007-003436	-
O	PORT OF TILLAMOOK BAY	PERMANENT EASEMENT TO TILLAMOOK COUNTY	4-13-07	FILE: 2007-003437	-

No.	REVISIONS	DATE	BY	APP'D.
3	-	-	-	-
2	Property Line, MISC Facilities	Sept-07	JWS	-
1	ALP Update by David Evans & Associates INC.	Feb-98	R.Norton	-

"THE PREPARATION OF THESE DOCUMENTS WAS FINANCED IN PART THROUGH A PLANNING GRANT FROM THE FEDERAL AVIATION ADMINISTRATION AS PROVIDED UNDER SECTION 505 OF THE AIRPORT AND AIRWAY IMPROVEMENT ACT OF 1982, AS AMENDED. THE CONTENTS DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THESE DOCUMENTS BY THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATE IN ANY DEVELOPMENT DEPICTED HEREIN, NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE IN ACCORDANCE WITH APPROPRIATE PUBLIC LAWS."

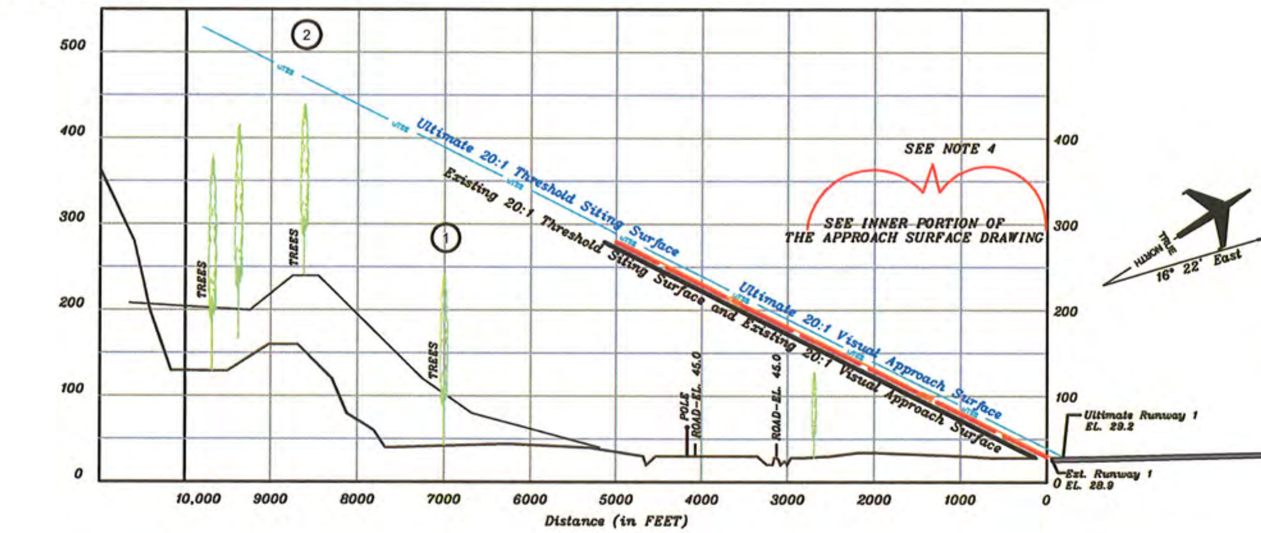
TILLAMOOK AIRPORT
AIRPORT PROPERTY MAP
EXHIBIT A
PORT OF TILLAMOOK BAY, OREGON

DETAILED BY: Larry D. Johnson | SHEET 11 OF 13
APPROVED BY: Stephen C. Wagner | June 29, 2012

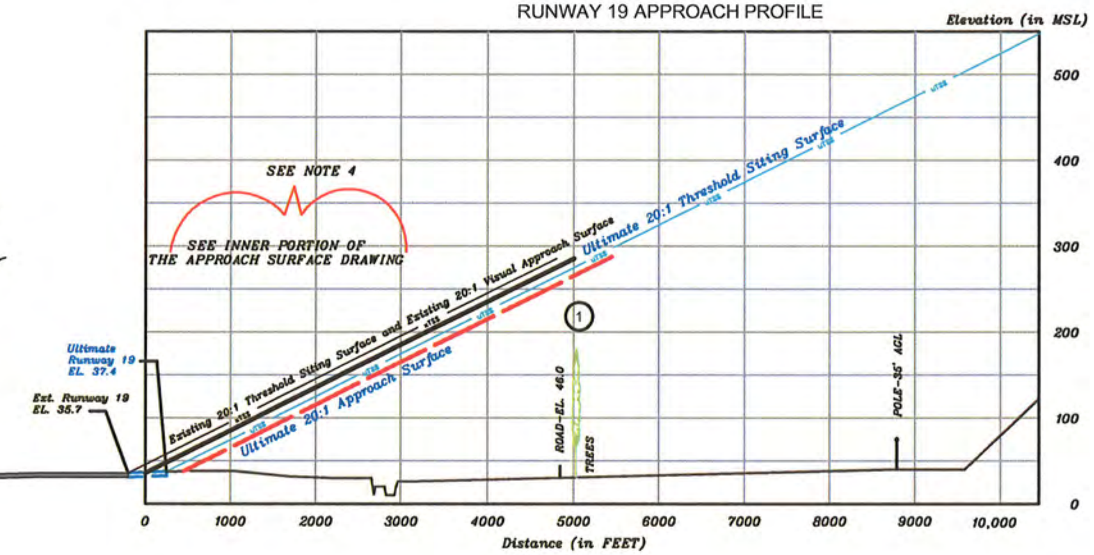
PRECISION APPROACH ENGINEERING

Coffman Associates Airport Consultants www.coffmanassociates.com

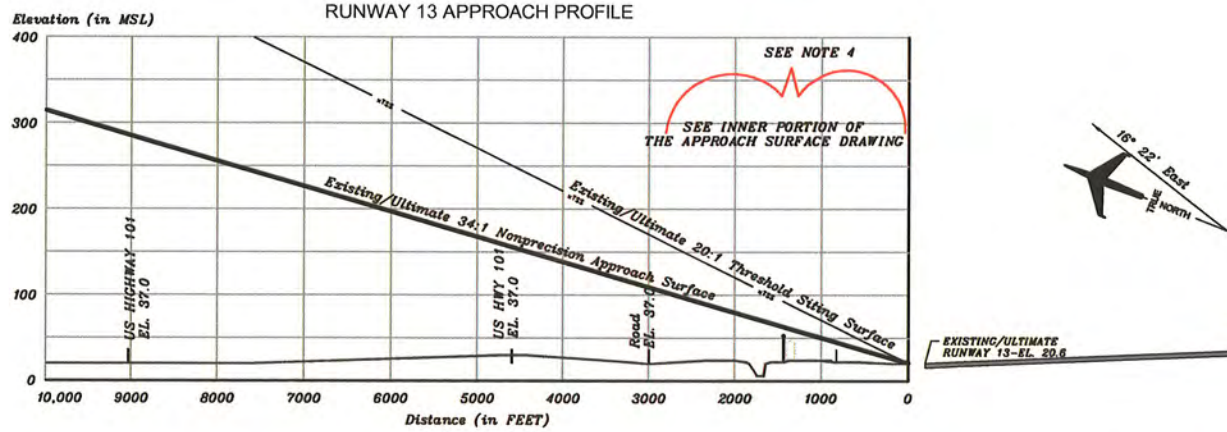
RUNWAY 1 APPROACH PROFILE



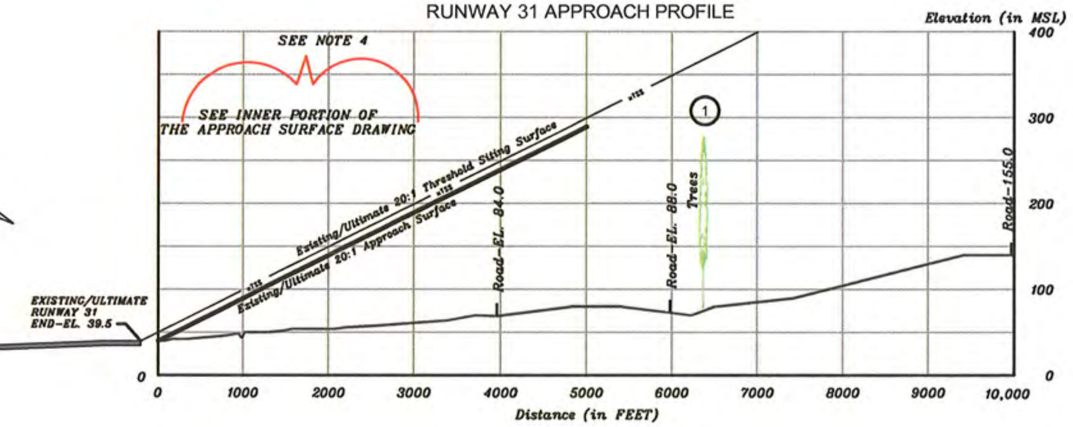
RUNWAY 19 APPROACH PROFILE



RUNWAY 13 APPROACH PROFILE



RUNWAY 31 APPROACH PROFILE



GENERAL NOTES:

1. Obstructions, clearances, and locations are calculated from ultimate runway end elevations and ultimate approach surfaces, unless otherwise noted. Road obstructions reflect a safety clearance of 10' for dirt Roads or private Roads, 15' for noninterstate Roads, 17' for interstate Roads, and 23' for railroad.
2. Depiction of features and objects within the primary, transitional, and horizontal Part 77 surfaces, is illustrated on the AIRPORT AIRSPACE DRAWINGS.
3. Depiction of features and objects within the outer portion of the approach surfaces, is illustrated on the APPROACH SURFACE PROFILES.
4. Depiction of features and objects within the inner portion of the approach surfaces, is illustrated on the INNER PORTION OF THE RUNWAY APPROACH SURFACE DRAWINGS.

OBSTRUCTION TABLE

Runway 1 Object Description/Elevation	Approach Penetration Ext. 20:1	Approach Penetration Ult. 20:1	TSS Penetration Ext. 20:1	TSS Penetration Ult. 20:1	PROPOSED DISPOSITION
- NONE	-	-	-	-	-
-	-	-	-	-	-
-					

OBSTRUCTION TABLE

Runway 19 Object Description/Elevation	Approach Penetration Ext. 20:1	Approach Penetration Ult. 20:1	TSS Penetration Ext. 20:1	TSS Penetration Ult. 20:1	PROPOSED DISPOSITION
- NONE	-	-	-	-	-
-	-	-	-	-	-
-					

OBSTRUCTION TABLE

Runway 13 Object Description/Elevation	Approach Penetration Ext. 34:1	Approach Penetration Ult. 34:1	TSS Penetration Ext. 20:1	TSS Penetration Ult. 20:1	PROPOSED DISPOSITION
- NONE	-	-	-	-	-
-	-	-	-	-	-
-					

OBSTRUCTION TABLE

Runway 31 Object Description/Elevation	Approach Penetration Ext. 20:1	Approach Penetration Ult. 20:1	TSS Penetration Ext. 20:1	TSS Penetration Ult. 20:1	PROPOSED DISPOSITION
- NONE	-	-	-	-	-
-	-	-	-	-	-
-					

Magnetic Declination
16° 22' East (May 2011)
Annual Rate of Change 9' West

0 100 200 300
VERTICAL SCALE IN FEET

0 1000 2000 3000
HORIZONTAL SCALE IN FEET

No.	REVISIONS	DATE	BY	APP'D.
3	-	-	-	-
2	Property Line, MISC Facilities	Sept-07	JWS	-
1	ALP Update by David Evans & Associates INC.	Feb-98	R.Norton	-

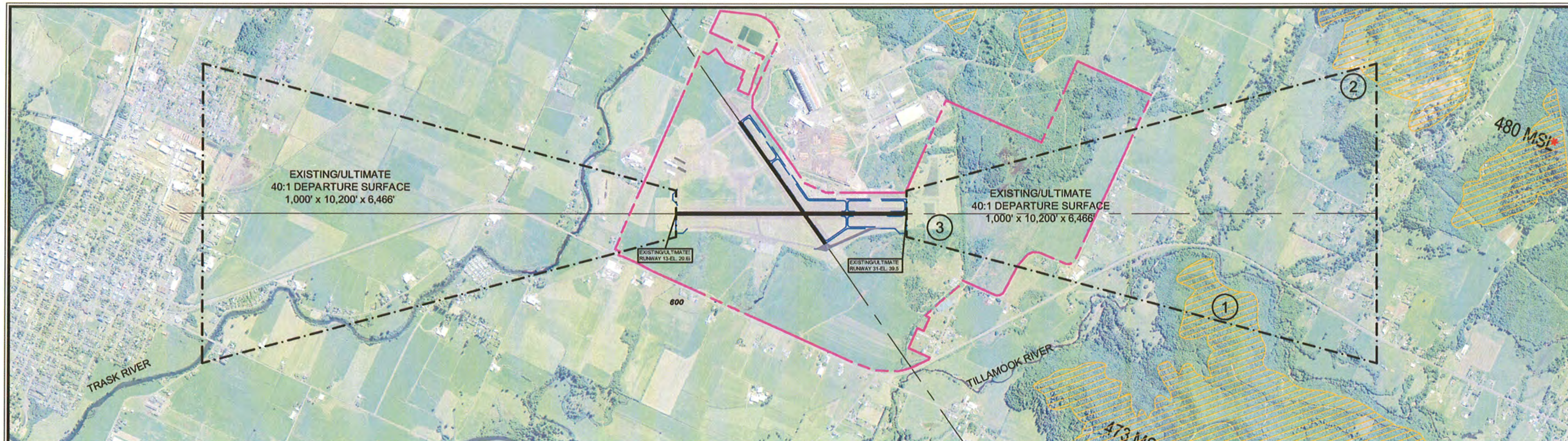
"THE PREPARATION OF THESE DOCUMENTS WAS FINANCED IN PART THROUGH A PLANNING GRANT FROM THE FEDERAL AVIATION ADMINISTRATION AS PROVIDED UNDER SECTION 505 OF THE AIRPORT AND AIRWAY IMPROVEMENT ACT OF 1982, AS AMENDED. THE CONTENTS DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THESE DOCUMENTS BY THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATE IN ANY DEVELOPMENT DEPICTED HEREIN, NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE IN ACCORDANCE WITH APPROPRIATE PUBLIC LAWS."

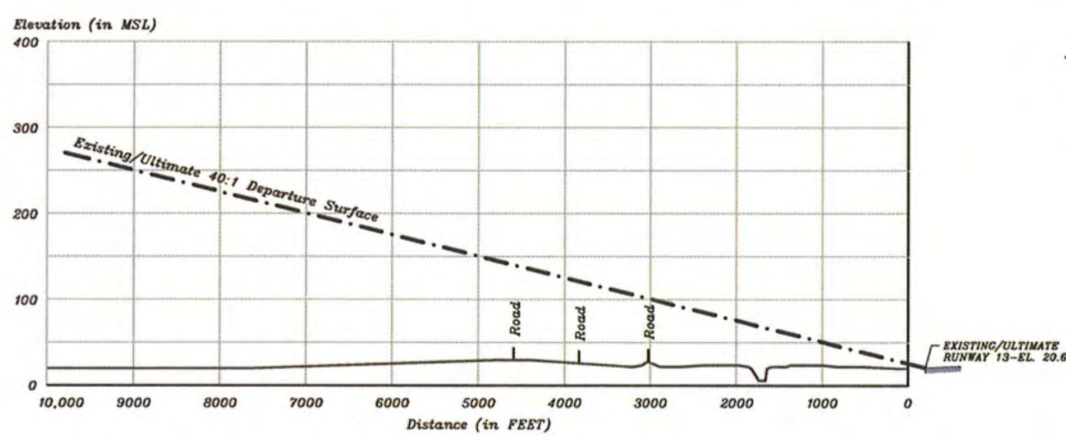
TILLAMOOK AIRPORT
RUNWAY 1-19 & RUNWAY 13-31
APPROACH SURFACE
PORT OF TILLAMOOK BAY, OREGON

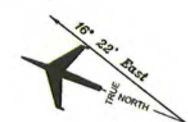
DETAILED BY: Larry D. Johnson	SHEET 12 OF 13
APPROVED BY: Stephen C. Wagner	June 29, 2012

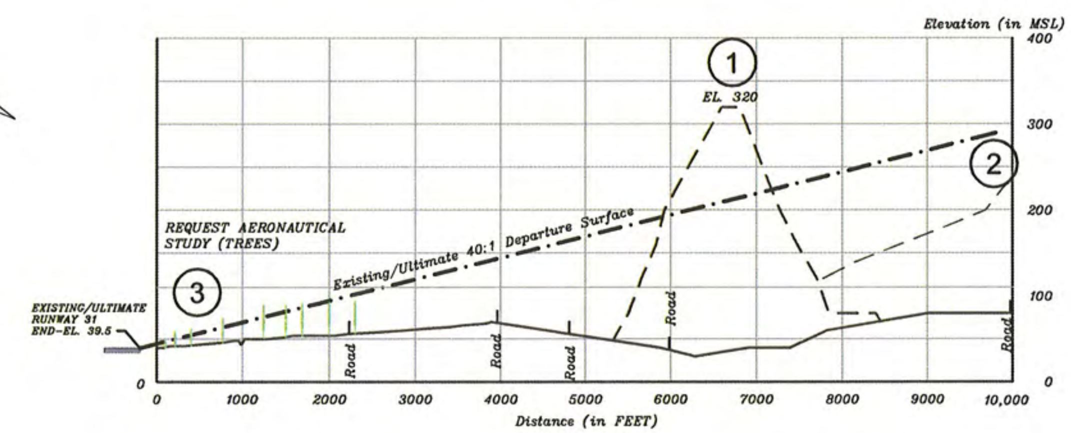
PRECISION APPROACH ENGINEERING

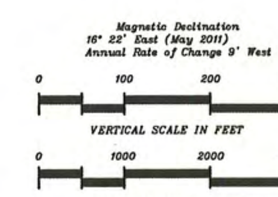
Coffman Associates
Airport Consultants
www.coffmanassociates.com











GENERAL NOTES:

1. Obstructions, clearances, and locations are calculated from ultimate runway end elevations and ultimate approach surfaces, unless otherwise noted. Road obstructions reflect a safety clearance of 10' for dirt roads or private roads, 15' for noninterstate roads, 17' for interstate roads, and 23' for railroad.
2. Standard in AC 150/5300-13 Appendix 2, Runway End Siting Requirements are not applicable for identifying objects affecting navigable airspace. See CFR Part 77 Title 14.
3. Roads and Buildings Clearance of more than 50 feet AGL are not detailed in Departure Surface Profiles.

OBSTRUCTION TABLE

Runway 13 Object Description/Elevation	40:1 Departure Surface		Obstacle Clearance Requirements (Remove, Relocate, or Lower Object)
	Elevation	Penetrations	
NONE	–	–	REMOVE

OBSTRUCTION TABLE

Runway 31 Object Description/Elevation	40:1 Departure Surface		Obstacle Clearance Requirements (Remove, Relocate, or Lower Object)
	Elevation	Penetrations	
1. TERRAIN EL 320	212 MSL	108'	Request Aeronautical Study
3. BRUSH/TREES VARIES	VARIES	VARIES	Request Aeronautical Study

No.	REVISIONS	DATE	BY	APP'D.
3	-	–	–	–
2	Property Line, MISC Facilities	Sept-07	JWS	–
1	ALP Update by David Evans & Associates INC.	Feb-98	R.Norton	–

"THE PREPARATION OF THESE DOCUMENTS WAS FINANCED IN PART THROUGH A PLANNING GRANT FROM THE FEDERAL AVIATION ADMINISTRATION AS PROVIDED UNDER SECTION 505 OF THE AIRPORT AND AIRWAY IMPROVEMENT ACT OF 1982, AS AMENDED. THE CONTENTS DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THESE DOCUMENTS BY THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATE IN ANY DEVELOPMENT DEPICTED HEREIN, NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE IN ACCORDANCE WITH APPROPRIATE PUBLIC LAWS."

TILLAMOOK AIRPORT

RUNWAY 13-31 DEPARTURE SURFACE

PORT OF TILLAMOOK BAY, OREGON

DETAILED BY: Larry D. Johnson

SHEET 13 OF 13

APPROVED BY: Stephen C. Wagner

June 29, 2012

PRECISION APPROACH ENGINEERING

Coffman Associates Airport Consultants www.coffmanassociates.com

PRECISION APPROACH
ENGINEERING

4575 SW Research Way
Suite 250
Corvallis, OR 97333
541-754-0043

KANSAS CITY
(816) 524-3500
237 N.W. Blue Parkway
Suite 100
Lee's Summit, MO 64063

Coffman Associates
Airport Consultants

PHOENIX
(602) 993-6999
4835 E. Cactus Road
Suite 235
Scottsdale, AZ 85254

www.coffmanassociates.com