North Bend Municipal Airport

Operated by OREGON INTERNATIONAL PORT OF COOS BAY

AIRPORT MASTER PLAN

AIRPORT MASTER PLAN

FINAL TECHNICAL REPORT

for

NORTH BEND MUNICIPAL AIRPORT
NORTH BEND, OREGON

Operated By Oregon International Port of Coos Bay

Developed
through the
Coordinated Efforts of
W&H Pacific, Beaverton, Oregon
Coffman Associates, Lee's Summit, Missouri
Landrum & Brown, Seattle Washington
Richard Turi Architecture & Planning, North Bend, Oregon
The Benkendorf Associates, Portland, Oregon

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North Bend, Oregon
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North Bend Municipal Airport

Chapter One
EXECUTIVE SUMMARY

Executive Summary

This master planning effort was undertaken by the Oregon International Port of Coos Bay to update the master plan done in May 1997 by David Evans and Associates in association with David Miller and Associates for the North Bend Municipal Airport. The plan created in 1997 called for a number of improvements to the airport that need to be revised due to changed circumstances and situations. This Master Plan was developed through the coordinated efforts of W&H Pacific, Inc./The IT Group, Beaverton, Oregon, Coffman Associates, Lee's Summit, Missouri, Landrum & Brown, Seattle, Washington, Richard Turi Architecture & Planning, North Bend, Oregon, and The Benkendorf Associates, Portland, Oregon.

In addition to the consultants and Port staff who were involved in the development of the master plan, a planning advisory committee (PAC) was assembled to review and comment on the drafts of the master plan chapters as they were developed. The planning advisory committee consisted of representatives from the Port, the Coast Guard, the cities of North Bend and Coos Bay, local business persons and local pilots. As the sections of the master plan were developed, they were distributed to the PAC, the FAA and the Oregon Department of Aviation two weeks prior to the PAC meetings. A total of six PAC meetings were held to review any comments on the chapters. In addition, two public information workshops were held to inform the public of the progress on the master plan and receive input. The master plan consists of eight different chapters, as follows:

- *Executive Summary*
- *Inventory*
- *Forecasts*
- *Facility Requirements*

- *Airport Alternatives*
- *Terminal Siting/ Alternatives*
- *Financial Plan*
- *Airport Plans*

INVENTORY

The North Bend Municipal Airport is located in the northern part of the City of North Bend, a city on the southern coast of Oregon. The airport is bordered on the north/northwest by Coos Bay and on the east by Pony Slough. The airport is in a marine climate, with mild and somewhat humid weather. The area economy is based in fishing, timber, and shipping, but continues to evolve. Tourism is another contributor to the local economy, with destination sights such as the Oregon Coast Lighthouses, Bandon Dunes resort Golf Course, a walk-through safari, and Shore Acres State Park. The airport terminal is approximately 1 mile from Highway 101, the area's major highway.

The airport was originally constructed as a military airport in 1943. The airport has three asphalt runways, one of which is no longer in use. Runway 4-22 is the primary instrument runway and Runway 13-31 is the primary general aviation runway. There are two main parallel taxiways. A fixed base operator to serve general aviation and the United States Coast Guard operate out of the airport. The airport has commercial service through Seattle-based Horizon Airlines, with four flights a day, in and out of the airport. Horizon Air, Fed Ex and Ameriflight also operate air cargo services out of the airport.

FORECASTS

Aviation demand forecasts were prepared for the planning horizon years of 2005, 2010, and 2020. Passenger enplanements are projected to increase from the current level of 29,034 (year 2000) to 70,000 by 2020. Total annual operations are projected to increase from 39,016 to 58,100. The number of based aircraft are expected to grow from 67 to 85, and reflect an increasing transition from single-engine to multi-engine aircraft and light business jets.

FACILITY REQUIREMENTS

The facility requirements evaluation translated forecast demand into needed facilities and evaluated the airport's compliance with FAA design standards. A benefit/cost analysis has indicated that the airport is eligible for 68 percent federal funding of an airport traffic control tower.

AIRPORT ALTERNATIVES

The overall objective of the airport alternatives effort was to achieve a balanced airside and landside complex to serve future aviation demand. A series of development alternatives were developed which could work in conjunction with several locations which were identified for future passenger terminal facilities. Consequently, the final decision with regard to the recommended master plan concept was driven by the future terminal location.

TERMINAL SITING/ ALTERNATIVES

In 2000, Richard Turi was asked by the Port Commission to analyze the existing terminal building and prepare options for reconfiguring/reconstructing the facility. It was later determined that a new building is more cost effective than renovating the existing building. As a result, a layout for a new terminal was developed based on the needs dictated by forecasted passenger demand. Based on demand, the terminal development is recommended to occur in two phases. A layout for the terminal is provided in the chapter. Also included in the development of the new terminal area is a recommendation to replace the existing ARFF building. The vehicle bays in the existing building are not large enough for modern-size firefighting vehicles.

There were three options for the location of the airport terminal. The locations were at the existing terminal, the existing large hangar (just north of the existing terminal), and the plateau on the northwest side of the airport. The three alternatives were evaluated based on general layout and site conditions, expansion capability, construction costs, environmental effects, infrastructure, function and operations, development benefits, construction phasing, community views and tsunami survival. The recommendation presented to the PAC was Alternative #1, at the existing terminal site. After reviewing the alternatives, the PAC requested additional cost information on the alternatives. A feasibility cost analysis was then performed on the alternatives and brought back to the PAC (see the appendix for construction costs for the terminal alternatives). The PAC decided that they preferred Alternative #2 because it facilitated the removal of the old hangar and allowed the use of the existing terminal for FBO's. The Port Commission then approved this alternative.

FINANCIAL PLAN

The financial plan presents the development schedule and examines potential funding sources for the program. Within this evaluation, the airport's operating fund was examined for its continuing ability to support future capital improvements. The 20-year $35 million development program will be eligible for $28 million in federal funding assistance.

The direction that the Port has chosen to take optimizes the opportunities available to the airport. Renovation of the existing terminal, removal of old buildings, and specific airport facility improvements will combine to rejuvenate the airport. However, revenue enhancement will be necessary to support the overall program.

The loss of tax levy, combined with the loss of lease rents (as buildings are removed) will curtail cash flow. Given the added burden of the cost of improvements, the Port will be asked to wisely determine a direction that both generates new revenue and seeks financial backing in the form of federal aid and loans. Marketing and sound management will contribute a great deal to this impetus. The *Airport*

Business Park Master Plan indicates a marketing strategy for greater revenue production.

AIRPORT PLANS

The airport plans are one of the last pieces of the master planning effort. The plans are a visual representation of the improvements to the airport that have been evaluated and decided upon during the course of the Facility Requirements and the Airport and Terminal Siting Alternatives. The plans provide a pictorial representation of the capital improvement projects that are presented in the financial plan, and incorporate how those changes affect the different aspects of the airport. There are nine plan sheets in the master plan drawing set. They are: the cover sheet, the airport layout plan, the terminal area plan, the airport airspace plan, the runway approach and protection zone profiles, and the land use plan. The airport layout plan is the one sheet in the set that is approved by the FAA. The other sheets are reviewed by the FAA, but are produced for the airport for reference and application of the master plan.

North Bend Municipal Airport

Chapter Two
INVENTORY

Inventory

INTRODUCTION

The first part of the master planning effort is to update the inventory. The inventory chapter will summarize economic and population changes around the airport, as well as the airport facilities, and operations information. By establishing a thorough and accurate inventory, an appropriate forecast, financial plan and airfield and landside development can be determined.

LOCATION AND GEOGRAPHY

North Bend Municipal Airport is located in the City of North Bend, Oregon in Coos County. The City of North Bend, along with the Cities of Coos Bay and Charleston, make up the "Bay Area" of Coos County on the Southern Oregon Coast. The "Bay Area" is approximately 110 miles north of the Oregon/California border, and midway between Seattle, Washington and San Francisco California. **Exhibit 2A** depicts the airport within its regional setting.

The airport is situated in the northern part of the city, bordered by the Coos Bay, Oregon's largest bay and natural deepwater port. The airport is surrounded by water on two sides: on the north/northwest by Coos Bay, and on the east by Pony Slough, a mud flat area stemming from the bay. The airport is surrounded by varied terrain, which is generally flat in the immediate area of the airport and to the west toward the Pacific Ocean, but is hilly to the north, east and south. These hills are covered with tall evergreen trees. The Oregon Dunes National Recreation Area is northwest of the airport. There is commercial development to the south of the airport, and a residential neighborhood to the southeast.

North Bend has a marine climate, which results in mild and somewhat humid weather. The highest maximum daily average temperature (1961-1990) was 67.1 degrees Fahrenheit, occurring in August. The lowest average daily minimum temperature was in January at 38.9 degrees Fahrenheit. The average total precipitation for the most recent recorded 30-year period was 63.48 inches, with approximately 161 days of rain with over 0.10 inches of precip-itation. The rainfall is induced by the

Coast Range, and occurs mostly in November, December and January. Snowfall is rare in the area, due to the low MSL elevation of North Bend at 6 feet. Winds come generally from the northwest from March through October, and from the southwest during November through February.

LOCAL HISTORY AND COMMUNITY PROFILE

The Coos Bay Area was originally inhabited by the Coos, Umqua, Siuslaw and Coquille Native American tribes. In the mid-1800s, the Europeans began to settle in the area, attracted by the same fertile valleys, waterways and forests from which the Native Americans hunted, gathered and fished. The economy and growth of the area was fueled by coal and gold mining, fishing, timber and shipping.

Fishing, timber and shipping continue to be the strength of the economy for the Bay Area, but dwindling timber resources have caused a shift in emphasis to agriculture and tourism. The economic base for the Bay Area continues to diversify, and is beginning to include manufacturing of musical instruments, handcrafted furniture, precision tools, plastics, and even an internet-based company called *800-Support*. A number of tourist attractions draw people to the area, and include:

- Shore Acres State Park
- Oregon Coast Lighthouses
- The Game Park walk-through safari in the nearby City of Bandon.
- Bandon Dunes Resort Golf Course

Transportation to and from the area is available via Greyhound and Porter Stage Lines (bus), and Horizon Air Commercial Service at the North Bend Municipal Airport. Highway 101 runs through the Bay Area, and the area is also served by Highways 42, 38 and 126, which connect with Interstate 5.

The utilities serving the area are the Coos Bay-North Bend Water Board (drinking water), Verizon Communications (local and long distance phone and internet service), Pacific Power (electricity), and Coos Bay Sanitary Service and North Bend Sanitation. Efforts are being made to bring natural gas into the area, although it is not currently available.

POPULATION AND ECONOMIC GROWTH

The population in Coos County declined (approximately two percent) from 1994-1997, but has remained relatively stable from 1997-1999. However, the population in North Bend increased by approximately three percent from 1990 to 1998 (see Table 2A, Population).

Table 2A, Population

	1970	**1980**	**1990**	**1998**
North Bend	8,553	9,779	9,614	9,910
Coos Bay	13,466	14,424	15,076	15,615
Coos County	56,515	64,047	60,100	61,400

Source: Coos County Economic Indicators; Population Change by City and Place; Oregon Employment Department; Oregon's Bay Area 2000 Business Directory and Community Profile

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Exhibit 2A
LOCATION MAP

The average unemployment rate between 1994 and 1998 was approximately nine percent, and the average annual payroll per employee was about $22,400.

Among the major employers of the area are the following:

- Bay Area Hospital
- Southwestern Oregon Community College
- Coos County
- Coos Bay and North Bend School Districts
- The Mill Casino
- Lone Rock Timber Company
- Weyerhaeuser Company

All companies employing more than 100 people are listed in the table below.

ACCESS TO THE AIRPORT

Airport access is gained along either East Airport Way or West Airport Way, and both lead primarily to the terminal parking lot. The airport terminal is approximately one mile from Highway 101. To get to the airport from Highway 101, turn west onto Virginia Avenue, a main road through downtown North Bend; turn north on Maple Street, then right onto East or West Airport Way. There are some additional side streets off Virginia Avenue, which lead to key card or padlocked gates; therefore, no general public access is available at these locations.

AIRPORT ADMINISTRATION

At the time of the previous Master Plan, the North Bend Municipal Airport was owned by the City of North Bend and operated by its Public Works Department. Due to the lack of funding, the operations on the airport were transferred to the Port of Coos Bay by an intergovernmental agreement between the City of North Bend and the Oregon International Board of Coos Bay on July 1, 1999. The City of North Bend owns the airport and its property, while the operations of the airport and authority over the airport belong to the Port of Coos Bay.

AIRPORT FACILITIES

RUNWAYS

North Bend Municipal Airport has three runways as depicted on **Exhibit 2B**. Runway 4-22 is 5,330 feet by 150 feet, and has a relocated threshold on the 22 end of the runway. The second runway is Runway 13-31, which is 5,045 feet by 150 feet. Runway 13 has a relocated threshold. . Runway 16-34 is 2,300 feet by 150 feet, and has a relocated threshold on the 34 end of the runway. This runway is used least often by aircraft, but is used at times to avoid cross wind.

Runway 4-22 was originally built in 1943, along with the other two runways and the majority of the airport pavement, with the exception of the last 1,316 feet on the end of Runway 4, which was constructed in 1988. The asphalt base and subbase concrete section of the runway, built in 1943, has been overlaid with two inches of asphalt concrete in 1977, and was overlaid with one inch of PFC in 1988 when the extension was built. The pavement is in excellent condition.

Runway 13-31 has an original asphalt surfaced section with base and subbase, and was overlaid in 1977 with two inches of asphalt concrete. This pavement is considered to be in fair condition. The last

1,000 feet and center 75 feet of Runway 13 were rehabilitated in 1996 by removing the top four inches of the existing asphalt section, keeping the base and subbase intact, and replacing the surface with a new four inches of concrete.

Runway 16-34 was originally constructed in 1943 with asphalt surfacing, base and subbase, and was slurry sealed in 1952. No work has been done to improve this pavement since then. The middle 50-feet is in poor condition, and the outside 50 feet on both sides is in good condition. The United States Coast Guard uses Runway 16-34 for hovering practice and maintenance checks of their helicopters.

TAXIWAYS AND TAXILANES

There are two main parallel taxiways, Taxiway C (parallel to Runway 4-22), and Taxiway A (parallel to Runway 13-31). The parallel taxiways are 50 feet wide. The original 1943 parallel taxiway section is 9.5 inches of crushed aggregate base and a three-inch asphalt concrete surface. A three-inch overlay was done in 1979. The only parallel taxiway pavement section that varies is adjacent to Runway 4, has an aggregate subbase and base with an asphalt surface course built in 1988. The pavement condition on the parallel taxiways ranges from good to excellent. Taxiway E connects Runway end 34 to Runway 13-31; Taxiway D connects Runway end 22 to Runway end 16. Taxiway B provides a midpoint connection between Runway 16-34 and Runway 13-31. There are a number of additional taxiways and taxilanes on the airport, varying in width, all with asphalt concrete surfacing with the exception of those taxilanes connecting the main apron to Taxiway A. Taxiway and taxilane conditions vary (refer to the Pavement Condition Ratings on **Exhibit 2C**).

APRONS AND AIRCRAFT PARKING

The main apron at the airport is approximately 250 feet by 1,300 feet. The apron is adjacent to the majority of the buildings on the airport property, with the terminal located at the south end of this main apron. Passenger service and cargo aircraft use this main apron in the area adjacent to the terminal. The area designated for the passenger planes can accommodate two Dash 8 aircraft. The remainder of the apron serves transient and based aircraft. The apron has various tiedown layouts for aircraft parking, but was designed for parking of 71 single-engine aircraft and 6 multi-engine aircraft (although some of the tiedowns overlap, so this capacity could not be achieved simultaneously).

A 12-unit t-hangar structure that is located at the north end of the apron is currently being removed. A plan is in place to rehabilitate, repair and re-stripe this apron. The existing pavement is eight inches of Portland cement concrete that was placed in 1943, with four inches of crushed aggregate base. Although the pavement is generally in very good condition, there are some panels that should be replaced. Joint sealing and spalling repair should be performed on the entirety of the apron. Along with this apron rehabilitation, the existing tiedowns would be removed and replaced with a layout accommodating, simultaneously, two Dash 8 commercial service aircraft, 36 small aircraft, and 4 multi-engine aircraft.

Two smaller aprons are located south of the main apron toward Runway 31. These aprons serve the corporate and general aviation aircraft with hangars adjacent to the apron. The pavement on both aprons is asphalt concrete and crushed base section constructed in the 1990s, and is in excellent

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Exhibit 2B
EXISTING FACILITIES

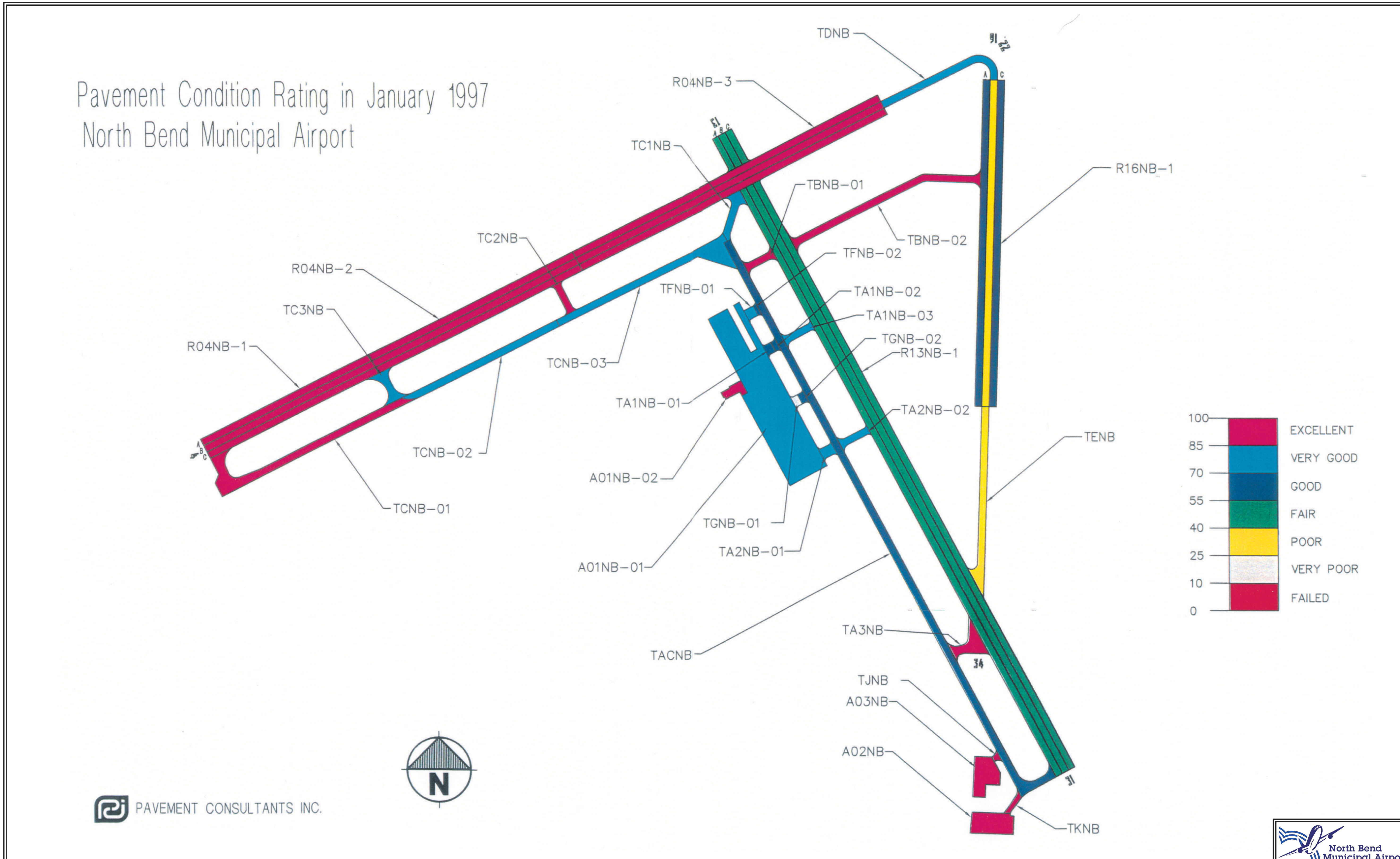

Exhibit 2C
PAVEMENT CONDITIONS RATINGS

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condition. The northernmost of the two aprons is adjacent to Taxiway A, connected by Taxiway J. The other apron is at the far south end of the airfield, and is connected to Taxiway A via Taxiway K. This apron has three standard tiedowns.

The United States Coast Guard has an apron adjacent to their building with roughly 4,200 square yards of pavement area. This apron is used for their five based Aerospatiale Dauphin helicopters. Taxiway H connects the Coast Guard apron to the southern end of Taxiway A.

Additional aircraft parking (transient and based) is available in hangars. A new t-hangar for based aircraft parking with 14 units was recently built at the northern end of the main apron. Transient and based aircraft parking is available in the large aircraft hangar, in the center of the main apron. Rates for tiedowns and hangars are shown in Table 2B, Ramp and Hangar Fees.

Table 2B, Ramp and Hangar Fees

Aircraft Type	Ramp per night	Ramp per month	Hangar per night	Hangar per month
Single Engine	$3.00	$30.00	$15.00	$75.00
Light Twin	3.00	30.00	20.00	100.00
Medium	5.00	50.00	30.00	120.00
Light Helicopter	3.00	30.00	15.00	75.00
Heavy Helicopter	5.00	50.00	30.00	120.00
Heavy Multi-Engine	20.00	200.00	N/A	N/A

Source: Oregon International Port of Coos Bay, North Bend Municipal Airport, Landing and Parking Fee Billing Information Form.

The airport also has landing fees of $1.30 per 1,000 pounds of aircraft weight, with a minimum fee of $15.00. There is no landing fee for aircraft owned or operated by a corporation or a company when it is being used for their own use, but there is a landing fee if the aircraft is a charter or operating for hire.

LANDSIDE FACILITIES

TERMINAL

The airport terminal is located adjacent to Runway 13-31 and Taxiway A, and at the south end of the main apron. The building was constructed in 1962. Airport management and operations offices are located in the terminal building on the main floor. Horizon Airlines, Hertz (a car rental service) and Verger Rent-a-car occupy space in the main area of the terminal building. A passenger waiting area and airport security are also on the main floor of the terminal building.

Short- and long-term parking is available in the parking lot in front of the terminal building.

FIXED BASE OPERATOR

North Bend Municipal Airport currently has one fixed base operator (FBO). Coos Aviation operates out of a hangar and buildings at the north end of the main apron. They provide aircraft maintenance, aircraft rental, and pilot training. Coos Aviation operates the only working fuel tanks on the airport (for their private use); i.e., an underground 12,000-gallon jet fuel tank and an above ground 5,000-gallon Avgas tank.

INTERNAL CIRCULATION AND ACCESS

Vehicle access to the airfield is limited by a number of fences around the airport. Pedestrian access can be gained through pedestrian access gates, through private hangars or through the terminal building. Vehicular traffic must get around the airport via the taxiways and aprons. There are a few gravel access roads around the airport that provide access to the airport NAVAIDS and lighting, and one paved access road that runs along the east side of the airport. This paved road was originally used to provide public access to the campgrounds along the east side of the airport. The campgrounds are now closed and the area is off-limits to the public.

AIRFIELD SUPPORT FACILITIES

SECURITY FENCING AND GATES

The entire airport is surrounded by a fence, with the exception of the areas adjacent to water and a portion of the area behind Taxiway C. There is a barbed wire fence on the south and northwest ends of the airport. A standard 6-foot fence with three strands of barbwire is located north of the terminal, along the main apron. The fence to the south of the terminal is standard fence and height, but is without barbwire.

There is a total of six vehicle access gates to the airport. There are three gates along the length of the main apron and one at the southernmost apron, all of which are operated by key cards. The other two gates are side-by-side at the beginning of the paved road on the east side of the airport. These gates are padlocked.

AIRCRAFT RESCUE AND FIREFIGHTING (ARFF)

The Aircraft Rescue and Firefighting is located northwest of the terminal building along the main apron. The building houses two Oskkosh fire\rescue vehicles. One vehicle holds 800 gallons of water and aqueous film forming foam (AFFF) and the other vehicle holds 50 gallons of the water and AFFF and 500 pounds of dry chemical powder. The Port is currently in the process of acquiring a new Index B to replace the 50-gallon vehicle. The new vehicle has a 1500-gallon water and AFFF capacity and holds 500 pounds of dry chemical powder. In addition to the on-airport firefighting capabilities, the North Bend Fire Department is under contract to provide primary ARFF response. The airport also has a mutual aid response agreement with the US Coast Guard who will provide additional firefighting assistance when necessary.

FUELING FACILITIES

There are no public fueling facilities on the airport. Coos Aviation maintains its own fueling facilities.

AIRPORT MAINTENANCE

Airport maintenance is performed by the Port of Coos Bay. A building behind the Coos Aviation aircraft maintenance building, adjacent to the main apron, houses the airport maintenance facilities.

UTILITIES

Utilities serving the airport are Pacific Power (electricity), City of North Bend (sewer), Coos County Water Board (water) and General Telephone (telephone).

NAVAIDS

Airport Navigational Aids, or NAVAIDS, provide electronic navigational assistance to aircraft for approaches to an airport. North Bend Municipal Airport is equipped with a number of NAVAIDS. A Non-Directional Beacon (NDB) is located 2.5 miles southwest of the airport. The NDB provides directional guidance through an established frequency. Approximately 3.4 miles east of the airport on one of the surrounding hills is a Very High Frequency Omnirange (VOR). The VOR also provides directional guidance through an established frequency. Runway 22 has a Microwave Landing System (MLS), which provides guidance for alignment and descent through the use of antennas on the ground transmitting to a receiver antenna on the aircraft. Runway 4 is equipped with an Instrument Landing System (ILS) which uses the combination of a line of sight signal and a reflected signal to give electronic alignment guidance, descent gradient and position to an approaching aircraft. These NAVAIDS are the basis for the instrument approach procedures at the airport. **Exhibit 2D** depicts the area airspace.

North Bend Municipal Airport has an Automatic Weather Observation Station (AWOS) from which the pilots can gain current weather information, such as temperature, wind and visibility. The AWOS is augmented by full-time weather observers.

LIGHTING AND SIGNING

Runways 4-22 and 13-31 are equipped with runway edge lighting and runway end-threshold lighting. Runway 4-22 has high intensity runway lighting, while Runway 13-31 has medium intensity runway lighting. Runway 4 and Runway 13 are both equipped with runway end identifier lights (REILs), which are flashing lights on either side of the runway threshold that help to delineate the end of the runway. The REILs on Runway 4 are radio-activated on a frequency of 122.95 MHz. Runway 16-34 has no runway lighting, but is delineated with edge reflectors.

A Precision Approach Path Indicator (PAPI) is available on Runway 31. PAPIs provide approach path guidance with a series of light units. The four-unit PAPI at North Bend Municipal Airport gives the aircraft an indication of whether its approach is too low, slightly low, too high, slightly high, or path through the pattern of red and white given by the light units.

Runway 4 has a Visual Approach Slope Indicator (VASI). A VASI is the older version of a PAPI, and uses only two light units. It also provides approach path guidance through the patterns of red and white lights.

North Bend Municipal Airport currently has no approach lighting systems. A rotating beacon is located on top of the large hangar adjacent to the main apron. The beacon delineates airport location through the use of 180-degree alternating lights.

All taxiways have edge lighting and taxilanes have either edge lights or edge reflectors. Runway 16-34 is equipped with only edge reflectors.

Signing at the airport was updated in 1994. The airport signing consists of lighted location signs, mandatory signs, directional and destination signs, and distance to go signs.

AIR TRAFFIC ACTIVITY

COMMERCIAL SERVICE AND AIR CARGO

Horizon Air, based out of Seattle, Washington, provides daily scheduled passenger air service to the airport. Horizon operates out of the west wing of the terminal building. They have service to and from Portland International Airport in Portland, Oregon and SeaTac International Airport in Seattle, Washington. All flights to and from Seattle stop in Portland, while all flights to and from Portland are non-stop. Dash 8 aircraft are used exclusively for the Horizon Air flights to and from North Bend. See Table 2C for the Horizon service schedule.

Table 2C, Horizon Air Service Schedule

To North Bend	To Portland	To Seattle
Arrival Time	**Departure Time**	**Departure Time**
11.15 a.m.	5:05 a.m.	5:05 a.m.
2:45 p.m.	11:35 a.m.	6:20 p.m.*
5:59 p.m.	3:30 p.m.	
9:40 p.m.*	6:20 p.m.*	

All flights operate daily, unless otherwise noted.
*No operations on Sundays.
Source: Horizon Air Direct Flight Timetable, October 29 to February 10, 2001

Horizon Air enplanements and deplanements grew 43 percent from 1995 to 1999. Passenger travel to and from North Bend Municipal Airport is consistently the busiest in August, and slowest in January and February. See Table 2D for Horizon Air passenger enplanement and deplanement detail.

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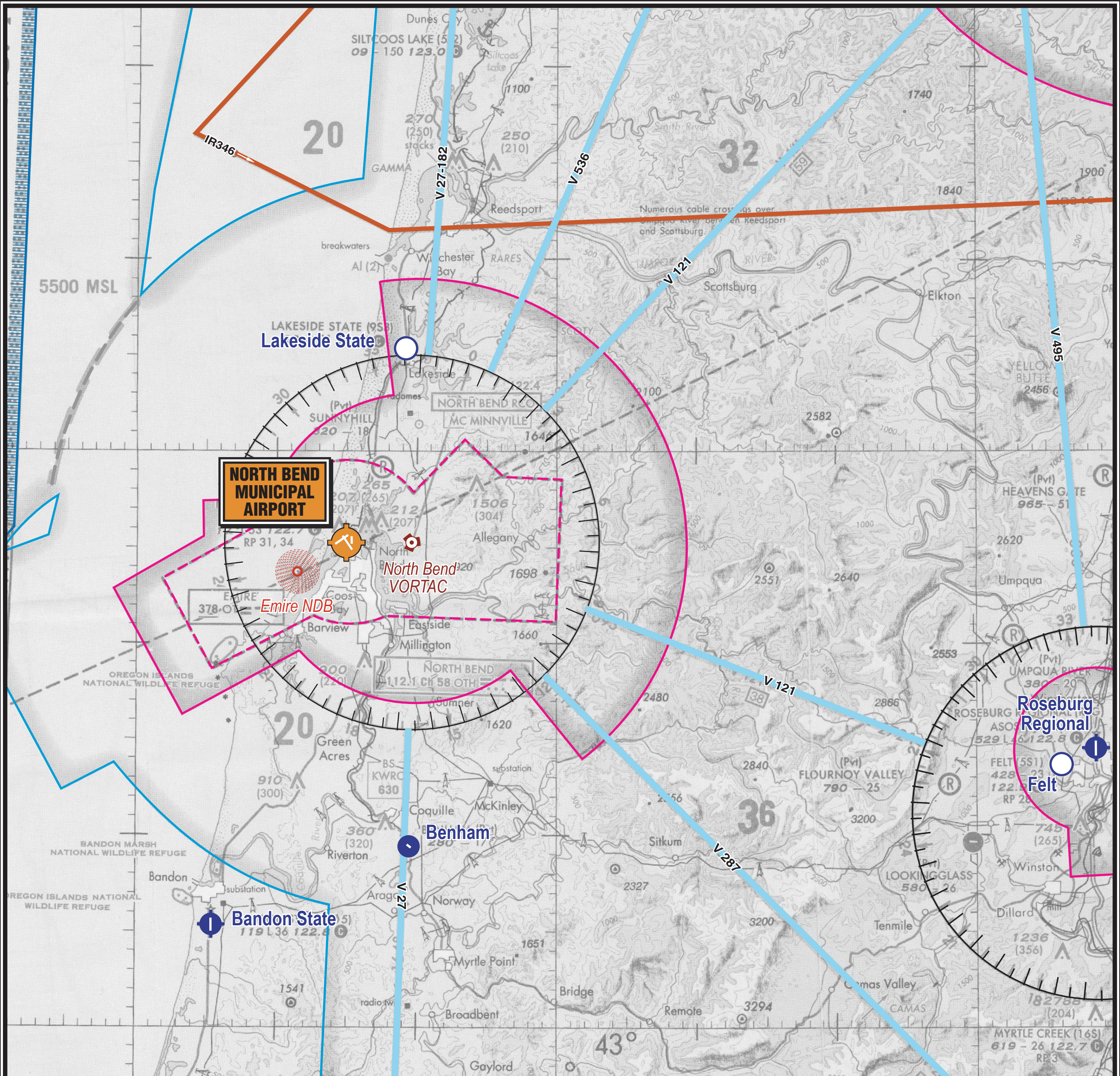

LEGEND

○	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'
	VOR
	VORTAC
	Non-Directional Radiobeacon (NDB)
	VOR-DME
	Compass Rose
- - - - (blue dashed)	Class D Airspace
(magenta solid)	Class E Airspace with Floor 700 ft. or greater above surface
(blue solid)	Class E Airspace with Floor 1200 ft. or greater above surface
- - - - (magenta dashed)	Class E Airspace
— — — (grey dashed)	Class E Airspace with Floor other than 700 ft. above surface
(light blue)	Victor Airways
(orange)	Military Training Routes
(hatched)	Restricted Areas

Source: Klamath Falls Sectional Chart, US Department of Commerce, National Oceanic and Atmospheric Administration

North Bend Municipal Airport

Exhibit 2D
AREA AIRSPACE & REGIONAL AIRPORTS

Table 2D, Horizon Air Enplanements and Deplanements

	1995	1996	1997	1998	1999	2000*
Enplanements	20,824	20,054	18,601	25,188	29,633	29,115
Deplanements	20,838	19,891	18,948	25,363	29,832	29,057
Total	**41,662**	**39,945**	**37,549**	**50,551**	**59,465**	**58,172**

* Numbers for December 2000 are not complete.
Source: Horizon Air Landing Reports and North Bend Municipal Airport Horizon Airlines Enplanements and Deplanements, 1995 to 2000.

Horizon Air, FedEx, and AmeriFlight, Inc. operate air cargo services on the airport. FedEx operates out of the hangar just to the northwest of the terminal building.

The weight of cargo carried by the air cargo companies is shown in Table 2E, Air Cargo Activity.

Table 2E, Air Cargo Activity

	Pounds Carried (Total of Enplanements and Deplanements)					
Carrier	**1995**	**1996**	**1997**	**1998**	**1999**	**2000***
AmeriFlight, Inc.					495,419[1]	669,875
FedeEx					296,880[2]	526,278
Horizon/Freight	372,511	350,246	248,582[3]	312,637	297,575	374,566
Horizon/Mail	10,729	12,914	6,348[3]	8,091	9,074	9,139

[1] No records for January through May 1999.
[2] No records for January through June 1999.
[3] No records for March or August 1997.
* Does not include December 2000
Source: Horizon Air Landing Reports and Airport Management Records.

UNITED STATES COAST GUARD

The United States Coast Guard runs helicopter operations out of the North Bend Municipal Airport. They have their own building and apron for their five based helicopters south of the terminal building. Two of the five based helicopters generally run out of the Newport Municipal Airport. This building is a Coast Guard base that includes training and maintenance facilities.

BASED AIRCRAFT AND OPERATIONS

Based aircraft at the airport have remained consistent over the past 20 years, ranging between 61 and 68 aircraft. The majority of the aircraft based at the airport are single engine aircraft, with some multi-engine aircraft, a jet, an ultra-light, and the five US Coast Guard helicopters.

Table 2F, Based Aircraft

Aircraft Type	1995	1997	1998	1999	2000
Single Engine	51	51	51	51	51
Multi-Engine	9	9	9	9	9
Jet	1	1	1	1	1
Helicopter	1	1	1	1	0
Military	5	5	5	5	5
Ultra-light	1	1	1	1	1
Source: FAA Form 5010					

Air traffic operations at the North Bend Municipal Airport, although steadily declining from 1995 to 1998, have been increasing since 1998. The period from 1998 to 1999 had slightly over one percent increase in operations, but the most significant change in operations in the past five years is from 1999 to 2000 when operations increased by 50 percent.

Large and business aircraft operations account for 30 to 60 percent of the operations at the airport. Local general aviation aircraft comprise about 20 percent of the airport operations, while itinerant general aviation rates are about 60 percent. Approximately 10 percent of the operations are commuter flights.

Table 2G, Air Traffic Operations

	1995	1996	1997	1998	1999	2000
Total	29,901	29,534	26,730	23,158	26,044	38,932
Large/Business Aircraft	14,221	13,438	11,963	11,173	14,630	14,143
Source: Airport Management Records.						

Operations activities increase during the spring and summer months, primarily as a result of improved weather conditions. December is historically the month with the least operations during the year.

EXISTING LAND USE AND ZONING

ON-AIRPORT LAND USE

The majority of the airport property is used for airfield and landside facilities. To the west of the airport is an airport-owned industrial park. The industrial park has a variety of businesses, such a senior center and a construction contracting business. Also, the City of North Bend sewage treatment plant is in the northwest corner of the airport property, adjacent to Runway 4-22. The southwest portion of the airport property is undeveloped. On the east side of the airport, along the Pony Slough, are an old parking lot, boat ramp and campground sites. This area is no longer open to the public, so the campgrounds have been closed and the parking lot is no longer in use. The boat ramp is used occasionally by the City of North Bend Fire Department Dive/Rescue team.

WETLANDS

There are significant amounts of wetlands on the North Bend Municipal Airport airfield. The wetlands were delineated with the last Master Plan Update (1997). The previous delineation will be used to determine impacts to wetlands for this Master Plan. No additional delineation will be performed.

OFF-AIRPORT LAND USE

To the north and east of the airport is a variety of light to heavy manufacturing. Weyerhaeuser has a large wood products plant northwest of the airport, across the bay. Southwest of the airport is residential property. Southeast of the airport is downtown North Bend, the main commercial district. Refer to **Exhibit 2E** for the zoning around the airport.

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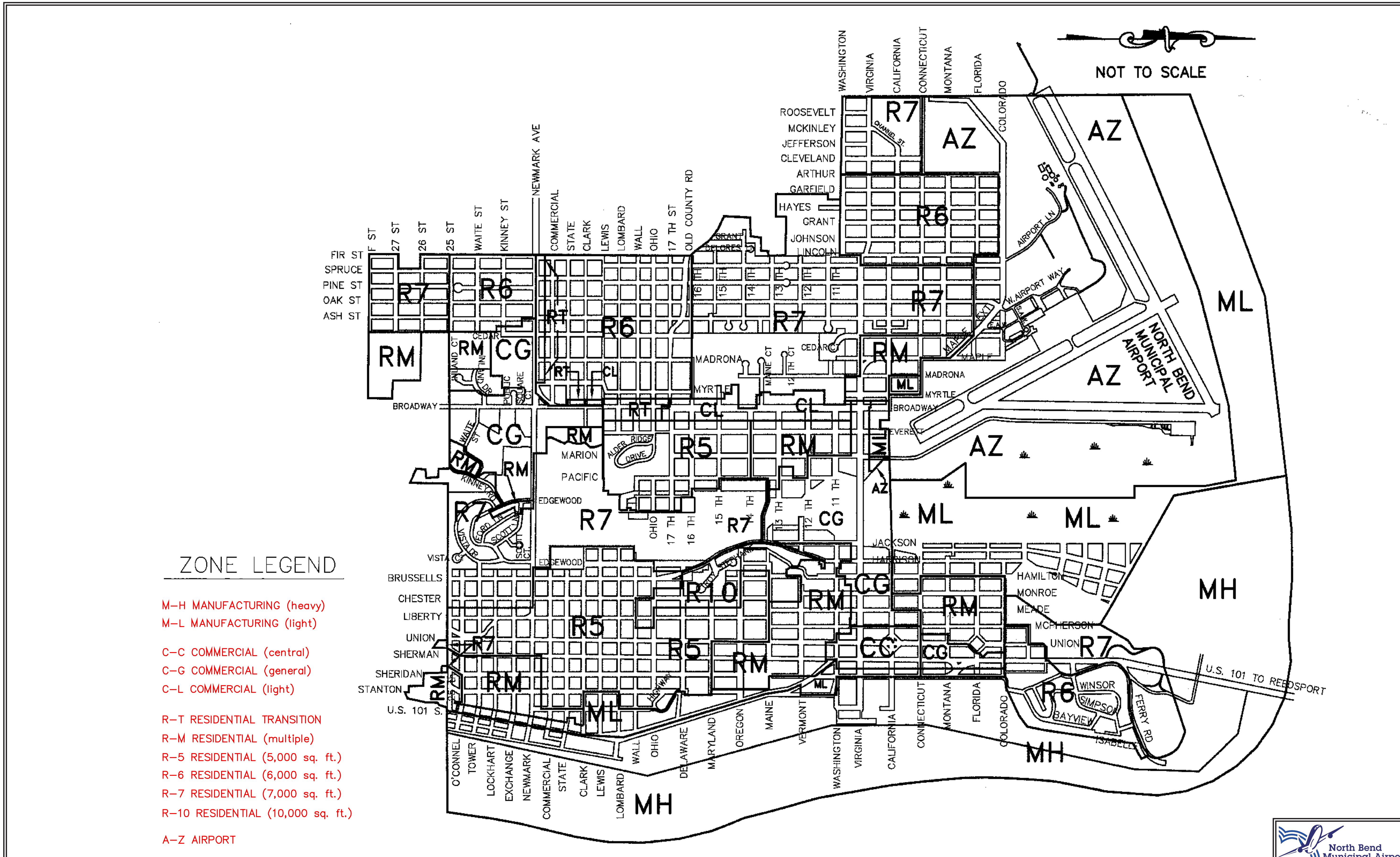


Exhibit 2E
CITY OF NORTH BEND ZONING MAP

Appendix A

GLOSSARY OF TERMS

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

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) transport mail by air pursuant to a current contract with the U.S. Postal Service. Certified in accordance with Federal Aviation Regulation (FAR) Parts 121 and 127.

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 ELEVATION: The highest point on an airport's usable runway expressed in feet above mean sea level (MSL).

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

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.

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.

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

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 (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 enroute phase of flight.

ALERT AREA: see special-use airspace.

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.

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

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

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.

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

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

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.

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

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.

CROSSWIND: wind flow that is not parallel to the runway of the flight path of an aircraft.

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

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.

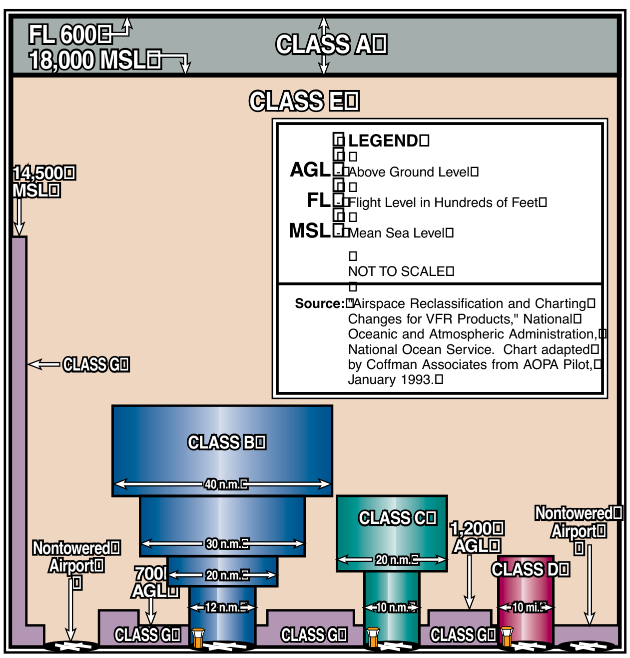
- *CLASS C:* generally, the airspace from the surface to 4,000 feet above the air port elevation (charted as MSL) surrounding those airports that have an operational control tower and radar approach control and are served by a qualifying number of IFR operations or passenger enplanements. Although individually 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 airport that have an operational control tower. Class D air space is individually tailored and configured to encompass published instrument approach procedures.
  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 LEG: A flight path at right angles to the landing runway off its upwind end. See "traffic pattern."

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

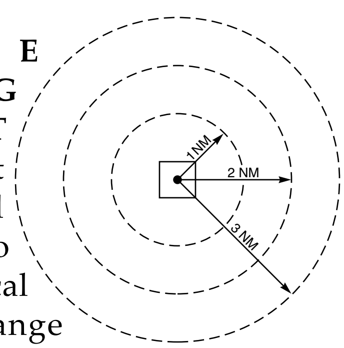
- *TAKEOFF RUNWAY AVAILABLE (TORA):* The runway length declared available and suitable for the ground run of an airplane taking off;

- *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; and

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

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



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

DNL: The 24-hour average sound level, in A-weighted 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."

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.

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

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."

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.

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

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

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: See "GPS."

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

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

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.

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

INSTRUMENT FLIGHT RULES (IFR): Rules governing the procedures for conducting instrument flight. Also a term used by pilots and controllers to indicate type of flight plan.

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

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

LANDING DISTANCE AVAILABLE (LDA): see declared distances.

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.

LORAN: long range navigation, an electronic navigational aid which determines aircraft position and speed by measuring the difference in the time of reception of synchronized pulse signals from two fixed transmitters. Loran is used for enroute navigation.

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

MILITARY OPERATIONS AREA (MOA): see special-use airspace.

MISSED APPROACH COURSE (MAC): The flight route to be followed if, after an instrument approach, a landing is not effected, 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.

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..)

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

NONDIRECTIONAL BEACON (NDB): A beacon transmitting nondirectional signals whereby the pilot of an aircraft equipped with direction finding equipment can determine his 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.

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

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

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

OPERATION: a take-off or a landing.

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

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 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.

PROHIBITED AREA: see special-use airspace.

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 enroute 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 enroute 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 BLAST PAD: a surface adjacent to the ends of runways provided to reduce the erosive effect of jet blast and propeller wash.

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

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

RUNWAY PROTECTION ZONE (RPZ): An area off the runway end to enhance the protection of people and property on the ground. The RPZ is trapezoidal in shape. Its dimensions are determined by the aircraft approach speed and runway approach type 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 VISUAL RANGE (RVR): an instrumentally derived value, in feet, representing the horizontal distance a pilot can see down the runway from the runway end.

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

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

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

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

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 pre-planned IFR departure procedure.

STANDARD TERMINAL ARRIVAL (STAR): a pre-planned IFR arrival procedure.

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.

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

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

TAKEOFF 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.

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

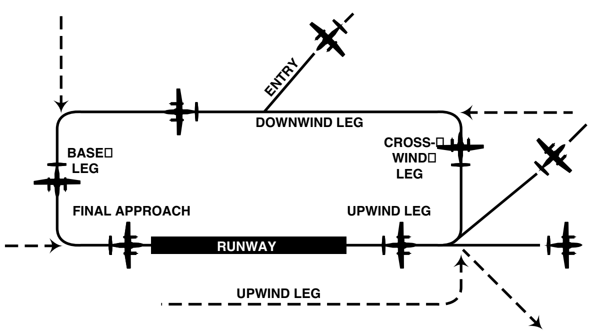
THRESHOLD: the beginning of that portion of the runway available for landing. In some instances the landing threshold may be displaced.

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 ZONE LIGHTING (TDZ): 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.

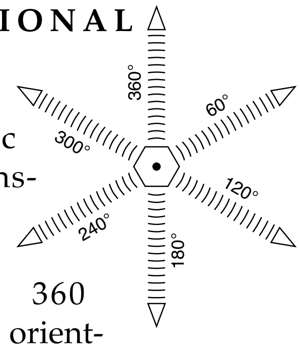
UNICOM: A nongovernment communication facility which may provide airport information at certain airports. Locations and frequencies of UNICOM's are shown on aeronautical charts and publications.



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

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

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



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

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

VISUAL APPROACH: An approach wherein an aircraft on an IFR flight plan, operating in VFR conditions under the control 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

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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.

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

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

WARNING AREA: see special-use airspace.

ABBREVIATIONS

AC: advisory circular

ADF: automatic direction finder

ADG: airplane design group

AFSS: automated flight service station

AGL: above ground level

AIA: annual instrument approach

AIP: Airport Improvement Program

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 light ing system with sequenced flashers (CAT II configuration)

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 (100LL)

AWOS: automated weather observation station

BRL: building restriction line

CFR: Code of Federal Regulations

CIP: capital improvement program

DME: distance measuring equipment

DNL: day-night noise level

DWL: runway weight bearing capacity for air

	craft with dual-wheel type landing gear
DTWL:	runway weight bearing capacity for 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 middle marker
LOC:	ILS localizer
LOM:	compass locator at ILS outer marker
LORAN:	long range navigation
MALS:	medium intensity approach lighting system
MALSR:	medium intensity approach lighting system with sequenced flashers
MALSR:	medium intensity approach lighting system with runway alignment indicator lights
MIRL:	medium intensity runway edge lighting
MITL:	medium intensity taxiway edge lighting
MLS:	microwave landing system
MM:	middle marker
MOA:	military operations area
MSL:	mean sea level
NAVAID:	navigational aid
NDB:	nondirectional radio beacon
NM:	nautical mile (6,076 .1 feet)
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

RCO: remote communications outlet

REIL: runway end identifier lighting

RNAV: area navigation

RPZ: runway protection zone

RTR: remote transmitter/receiver

RVR: runway visibility range

RVZ: runway visibility zone

SALS: short approach lighting system

SASP: state aviation system plan

SEL: sound exposure level

SID: standard instrument departure

SM: statute mile (5,280 feet)

SRE: snow removal equipment

SSALF: simplified short approach lighting system with sequenced flashers

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

STAR: standard terminal arrival route

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

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

TAF: Federal Aviation Administration (FAA) Terminal Area Forecast

TACAN:	tactical air navigational aid
TORA:	takeoff runway available
TODA:	takeoff distance 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

North Bend
Municipal Airport

Chapter Three

AVIATION DEMAND FORECASTS

Aviation Demand Forecasts

Facility planning must begin with the definition of the demand that may reasonably be expected to occur over the twenty-year planning period. In airport master planning this involves forecasts of aviation activity indicators that define the level of airport demand. Forecasts of commercial service and general aviation are used as the basis for facility planning, financial projections, and environmental analysis.

It is virtually impossible to predict with certainty year-to-year fluctuations of activity when looking twenty years into the future. Because aviation activity can be affected by many influences at the local, regional, and national level, 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. This makes it important to review the airport's activity on a regular basis to determine if changes to the guidelines are necessary.

The last master plan was completed in 1997, but based on 1993 data. Annual passenger volumes have continued to increase, reflecting strong regional demands for air service. The air cargo industry has had a sustained period of growth which has created increasing demands on companies providing feeder services.

The following forecast analysis examines recent developments, historical information, and current aviation trends for North Bend Municipal Airport to provide an updated set of passenger and operational projections. The intent is to permit the Oregon International Port of Coos Bay to make the planning adjustments necessary to ensure that

the facility meets projected demands in an efficient and cost effective manner.

NATIONAL AVIATION TRENDS

Each year, the Federal Aviation Administration (FAA) publishes it's national aviation forecast. Included in this publication are forecasts for major air carriers, regional/commuters, general aviation, and FAA workload measures. The forecasts are prepared to meet 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 by the general public. The current edition when this chapter was prepared was *FAA Aerospace Forecasts- Fiscal Years 2000-2011.* The forecast uses 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.

For the U.S. aviation industry, the outlook for the next twelve years is for moderate economic growth, declining real fuel prices (after an expected one-year spike in 2000), and moderate inflation. Based on these assumptions, aviation activity by fiscal year 2011 is forecast to increase by 18.9 percent at combined FAA and contract towered airports and 24.6 percent at air route traffic control centers. The general aviation active fleet is projected to increase by almost 12.5 percent, while general aviation hours flown are forecast to increase by 18.1 percent. Scheduled domestic passenger enplanements are forecast to increase 54.6 percent -- air carriers increasing 52.8 percent and regional/ commuters growing by 90.1 percent.

COMMERCIAL AVIATION

The commercial aviation industry recorded its seventh consecutive year of strong traffic growth in 1999. To a large extent, growth in both domestic and international markets was driven by the continued strong expansion in the U.S. and world economies. Domestic passenger enplanements grew by 3.5 percent, while load factors reached 70.8 percent, down 0.1 percent from the previous year, due to a 4.6 percent increase in available seat-miles in 1999.

Although operating profits were down $702 million in 1999, it was the second highest year for operating profits since deregulation of the industry in 1978. The industry operating profit in 1998 was $9.3 billion. In 1999 the operating profit was $8.6 billion. The significant decline in the growth rate of operating expenses in 1998 and 1999 was due, largely, to the low cost of fuel.

The commercial aviation industry will need similar or higher profits over the next several years if the industry is to be able to finance the replacement and new aircraft needed to accommodate future growth and meet the federally mandated noise regulations.

New aircraft deliveries totaled 623 in FY 1997, a 36.2 percent increase over the same period in 1996. The relatively large increase in new aircraft deliveries in 1997 is due, in large part, to the industry's dismal financial performance during the early 1990s, a period during which there were relatively few orders for new aircraft. As such, new aircraft deliveries slowed considerably during the 1995-96 period.

The demand for narrowbody aircraft continues to outpace the demand for widebody aircraft, accounting for nearly 60 percent of deliveries last year. However, this does not reflect the increasing demand for the new regional jets among the commuter airlines. While the number of regional jets in worldwide service now total less than 400, orders for the 30 to 75 seat regional jets currently total in excess of 700.

While there are a number of positive signs that point towards a continuation of the current rebound in commercial aviation, there are also a number of uncertainties that could limit the growth of the economy, and ultimately, the demand for aviation services.

These include higher fares being paid by business travelers, increasing personal debt which may affect discretionary travel, and continuing stagnation in middle class incomes.

The FAA's projections for domestic and international commercial service passenger enplanements indicate relatively strong growth. Domestic enplanements are projected to grow at an average annual rate of 3.6 percent through the year 2011. International enplanements are projected to grow at an average annual rate of 5.8 percent.

REGIONAL/COMMUTER AIRLINES

The regional/commuter airline industry is defined as the air carriers providing regularly scheduled passenger service with fleets composed primarily of aircraft having 60 seats or less. (Note: Carriers such as Horizon Air, who operate aircraft in both size categories, report passenger traffic as both scheduled air carriers and commuters, requiring an adjustment by the FAA to avoid duplication). However, this definition is expected to change in the future as regional airlines add large regional jets to their operating fleets.

Similar to the commercial air carriers, the smaller regional/commuter airlines experienced continued growth in 1999, but at a higher rate than experienced by the commercial jet airlines.

The regional/commuter industry continues to be the strongest growth sector of the commercial air carrier industry. Dramatic growth in code-sharing agreements with the major carriers, followed by a wave of air carrier acquisitions and purchases of equity interests, has resulted in the transfer of large numbers of short-haul jet routes to their regional partners and fueled the industry's growth.

Industry growth is expected to continue to outpace that of the larger commercial air carriers. The introduction of new state-of-the-art aircraft, especially high-speed turboprops and regional jets with ranges of up to 1,000 miles, is expected to open up new opportunities for growth in non-traditional markets. While the primary role of the regional airline industry will remain that of feeding traffic to the major and national carriers, the regional jet should provide new growth opportunities to serve distant point-to-point markets.

The regional airline industry will continue to benefit from the continued integration with the large air carriers. The further need for larger commercial air carriers to reduce costs and fleet size will insure that these carriers continue to transfer smaller, marginally profitable routes to the regional air carriers.

Likewise, the increased use of regional jets is expected to lead to another round of route rationalization by the larger commercial carriers, particularly on low-density routes in the 500-mile range. Regional jet aircraft can serve these markets with the speed and comfort of a large jet, while at the same time providing greater service frequency that is not economically feasible with the larger jet. This is expected to contribute to strong growth during the early portion of the planning period, although this phenomenon is expected to diminish during the mid to latter portion of the planning period.

Passenger enplanements are expected to increase at an average annual rate of 5.5 percent during FAA's 12-year forecast period from 1999 to 2011, with annual enplanements increasing from 72.4 million in 1999 to 137.5 million by 2011. (Actual enplanements for 1999 were 72.3 million). The average seats per aircraft is also projected to grow, from 36 seats in 1999 to 44.3 seats in 2011. **Exhibit 3A** depicts passenger and fleet mix forecasts for the U.S. Regional/Commuter market.

GENERAL AVIATION

By most statistical measures, general aviation recorded its fifth consecutive year of growth. Following more than a decade of decline, the general aviation industry was revitalized with the passage of the *General Aviation Revitalization Act* in 1994 (federal legislation which limits the liability on general aviation aircraft to 18 years from the date of manufacture). This legislation sparked an interest to renew the manufacturing of general aviation aircraft due to the reduction in product liability and a renewed optimism for the industry. The high cost of product liability insurance was a major factor in the decisions by many American aircraft manufacturers to slow or discontinue the production of general aviation aircraft.

According to the General Aviation Manufacturers Association (GAMA), aircraft shipments and billings grew for the fifth consecutive year in 1999, following fourteen years of annual declines. In the first three quarters of 1999, general aviation aircraft manufacturers shipped a total of 1,692 aircraft. For 1999, aircraft shipments were up 10.8 percent for piston aircraft and 26.2 percent for jets. In 1996, general aviation aircraft manufacturers shipped a total of 1,130 aircraft totaling $3.1 billion.

The total pilot population is projected to increase from 640,113 in 1999 to 824,490 by 2011, an annual increase of

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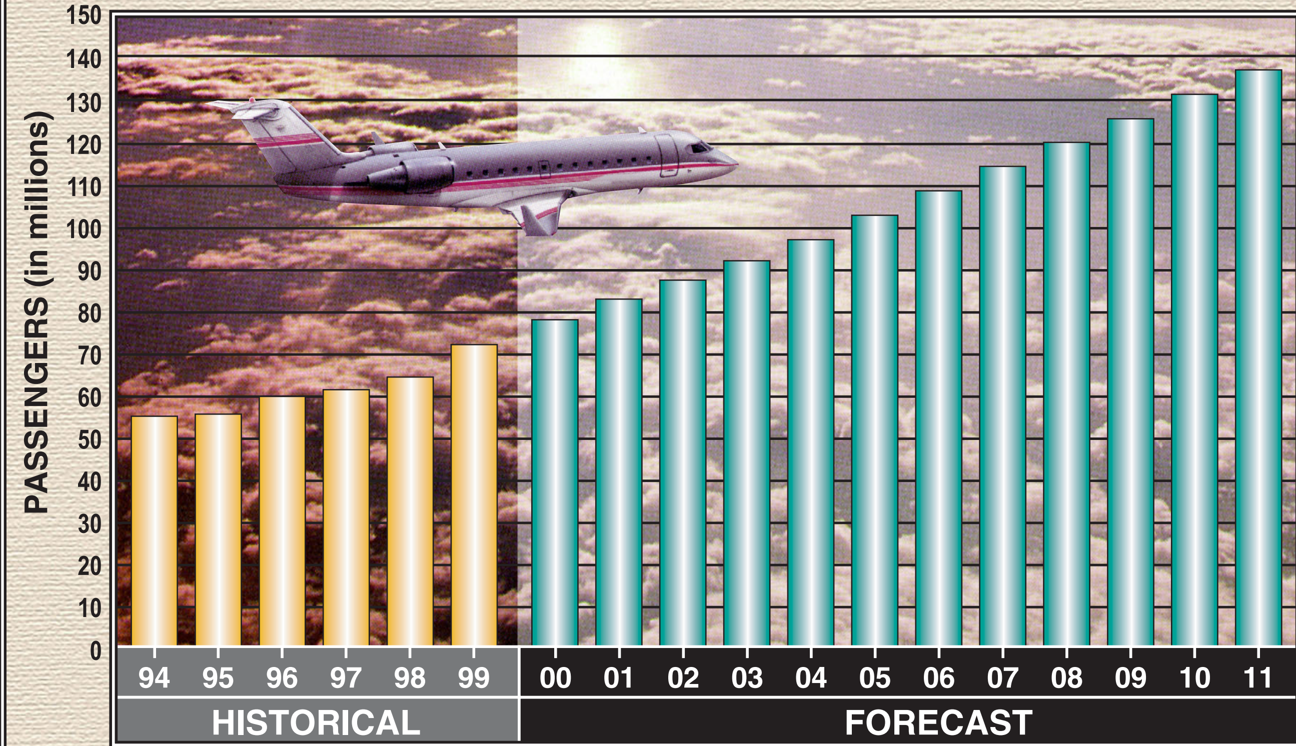
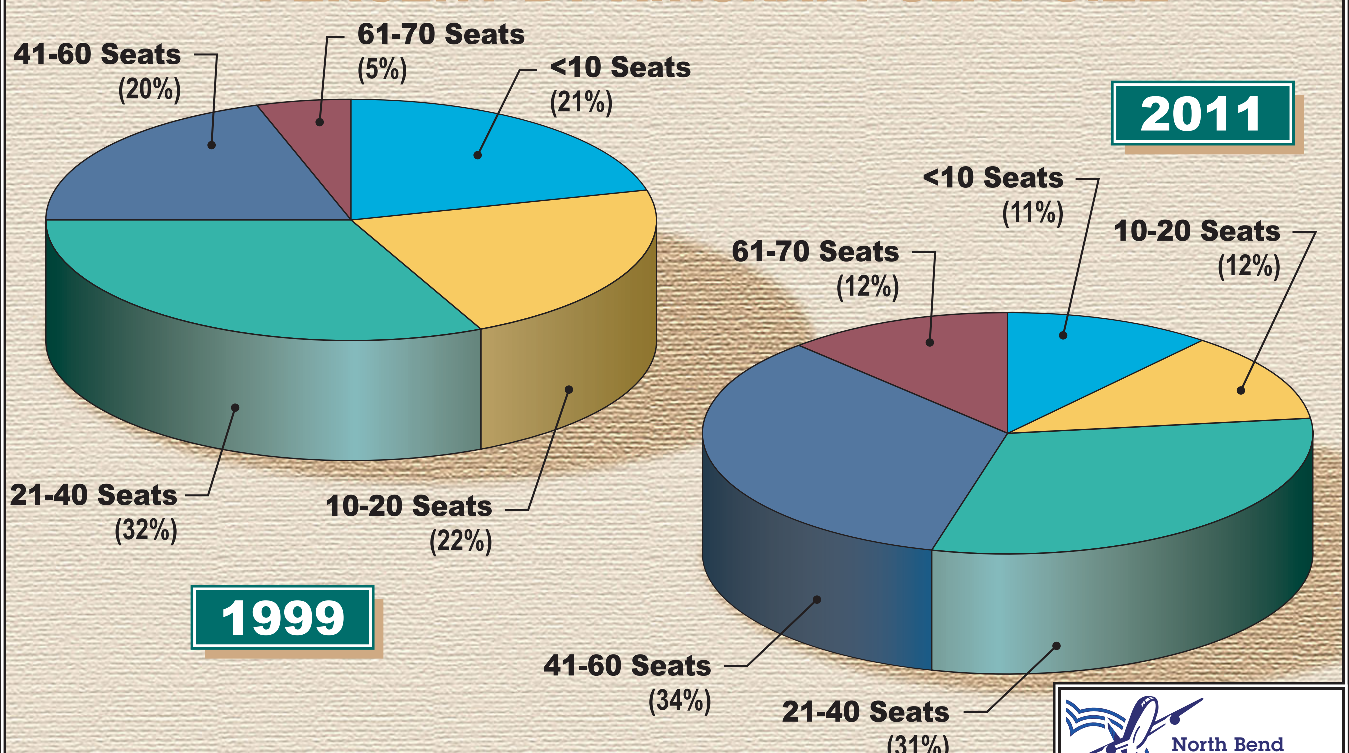
U.S. REGIONAL/COMMUTER SCHEDULED PASSENGER ENPLANEMENTS



Source: FAA Aerospace Forecasts, FY 2000-2011

PERCENT BY AIRCRAFT SEAT SIZE



North Bend Municipal Airport

Exhibit 3A
U.S. REGIONAL/COMMUTER FORECASTS

2.1 percent over the 12-year forecast period. The pilot category showing the largest increase over the forecast period are student pilots, up 3.4 percent. In 1999, historical student pilot starts increased for the third consecutive year, increasing by 4.4 percent over 1998. These student pilots are the future of general aviation and are one of the key factors impacting the future direction of the general aviation industry. This increase, combined with the increases in piston-powered aircraft shipments and aircraft production, are a signal that many of the industry initiated programs to revitalize general aviation are taking hold.

The most notable trend in general aviation is the continued strong use of general aviation aircraft for business and corporate uses. According to the FAA, general aviation operations and general aviation aircraft handled at en route traffic control centers increased for the eighth consecutive year, signifying the continued growth in the use of the more sophisticated general aviation aircraft. In 1998 (the latest year of recorded data), the number of hours flown by the combined use categories of business and corporate flying represented 23.9 percent of total general aviation activity. In 1990, the number of hours flown by the combined use categories of business and corporate flying represented 21.8 percent of total general aviation activity.

Manufacturer and industry programs and initiatives continue to revitalize the general aviation industry with a variety of programs. For example, Piper Aircraft company has created Piper Financial Services (PFS) to offer competitive interest rates and/or leasing of Piper aircraft.

The most striking industry trend is the continued growth in fractional ownership programs. Fractional ownership programs allow businesses and individuals to purchase an interest in an aircraft and pay for only the time that they use the aircraft. This has allowed many businesses and individuals to own and use general aviation aircraft for business and corporate uses. Aircraft manufacturers such as Raytheon, Bombardier, and Dassault Falcon Jets have all established fractional ownership programs. Industry leader Executive Jet Aviation has expanded their program to include Boeing Business Jets and Gulfstream Aircraft.

Exhibit 3B depicts the FAA forecast for active general aviation aircraft in the United States. The FAA forecasts general aviation active aircraft to increase at an average annual rate of 0.9 percent over the 12 year planning period. General aviation aircraft are projected to increase from 204,710 in 1998 to 230,995 in 2011. Over the forecast period, the active fleet is expected to increase by almost 2,000 annually (this assumes approximately 2,000 annual retirements of older piston aircraft and new aircraft production at 4,000 annually). Turbine-powered aircraft are projected to grow faster than all other segments of the national fleet and grow 3.2 percent annually through the year 2011.Turbojet aircraft are projected to provide the largest portion of this growth and grow at 1.2 percent annually. Turboprop aircraft are projected to grow at 1.2 percent annually. The strong growth projected for the turbojet aircraft is the result of the strong growth in the fractional ownership industry, new product offerings (which include both new entry level aircraft and long range global jets), and a shift from commercial air travel by many travelers and corporations.

AIRPORT SERVICE AREA

The service area is generally defined by the proximity of other airports. As noted previously, there are only a few public and private use facilities in the immediate area. From a commercial service perspective, several factors affect the decision to fly from North Bend Municipal Airport: drive time to Eugene, Medford, or Portland (which are 130 miles, 175 miles, and 220 miles from North Bend/Coos Bay, respectively), availability of flights and equipment, airfares, and the type of traveler (business vs. pleasure), to name but a few.

From a general aviation perspective, the service area is generally more closely defined around the airport since other general aviation airports in the area will provide services to smaller aircraft. However, this factor is influenced by the need for many general aviation operators to have the level of services provided at North Bend Municipal Airport, including longer runways, mechanical and airframe services, and instrument capability.

Therefore, it is difficult to draw a specific line around the airport and define it as the true service area. However, with the heaviest concentration of population based in Coos County, socioeconomic characteristics of this one county will be used in subsequent forecasting analyses. It is recognized that the surrounding counties in southwestern Oregon - Douglas, Curry, and Josephine- contribute to local aviation demands.

North Bend Municipal Airport is classified as a "non-hub" primary commercial service airport, enplaning less than 0.05 percent of the total passenger enplanements reported nationally. It functions as a commuter service airport, feeding passengers into Portland and Seattle.

It also serves an important function to the U.S. Coast Guard for air-sea rescue operations. The Coast Guard bases five Aerospatiale Dauphin helicopters on their property which has through-the-fence access to the airport.

Increasing demands for air cargo and air mail services are met by several air cargo operators and Horizon Air. There are 67 aircraft based at North Bend Municipal Airport. The local fixed base facility is Coos Aviation, providing fueling service, aircraft maintenance, aircraft rental, and pilot training.

LOCAL DEMOGRAPHICS AND ECONOMY

The population in Coos County in 2000 was estimated to be 62,968. Projections were researched from *The Complete Economic and Demographic Data Source, 2000 (CEDDS)* as maintained

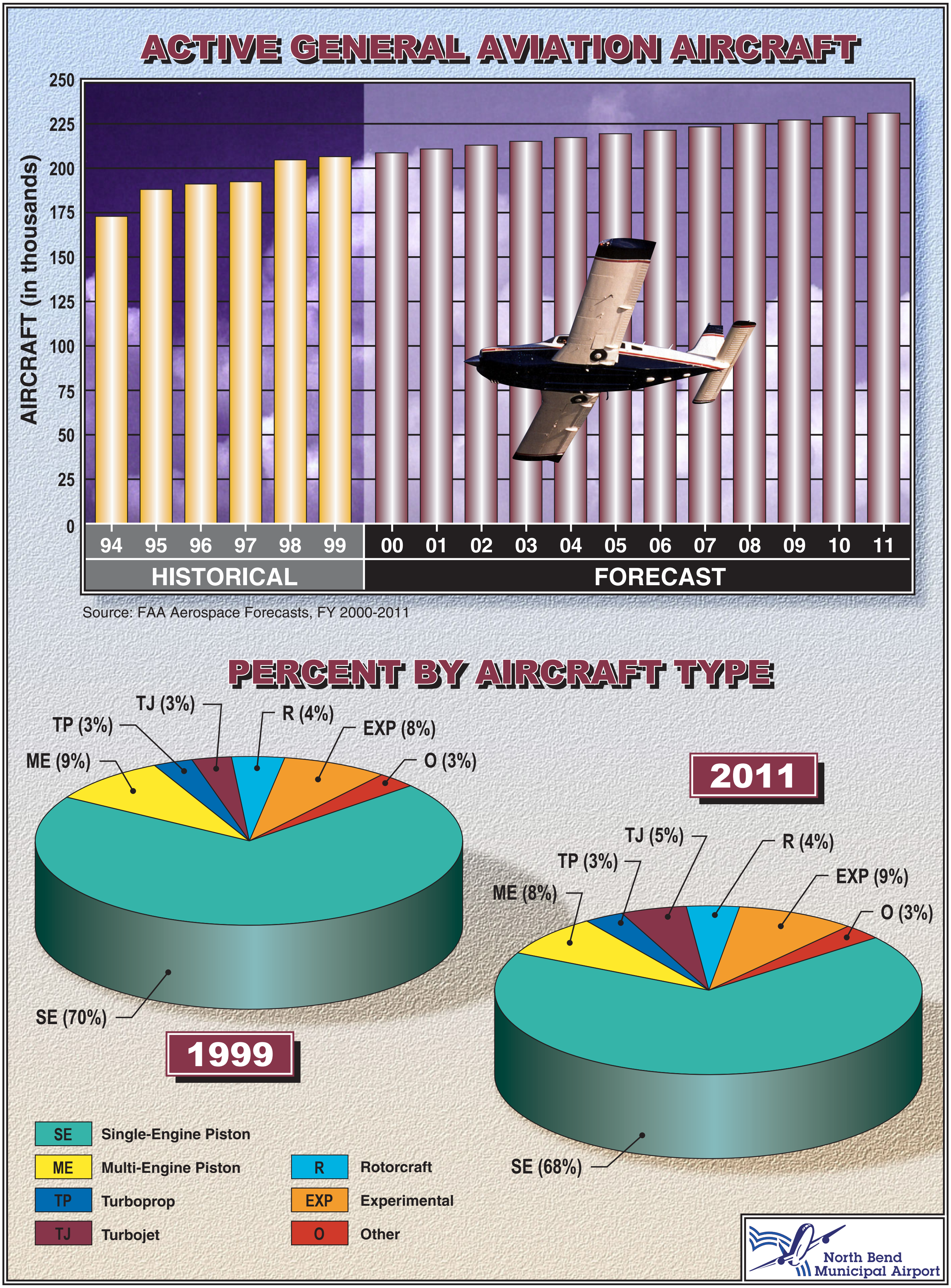


Exhibit 3B
U.S. ACTIVE GENERAL AVIATION
AIRCRAFT FORECASTS

by Woods and Poole Economics, Washington, D.C. and the Oregon Employment Department. These reflect a projected average annual growth rate of 0.7 percent from 2000 to the year 2020. These scenarios are presented in **Table 3A**. Both historical and forecast data for Coos County and the state of Oregon indicate a moderate increase in employment and Per Capita Personal Income (PCPI), with population for Oregon and, particularly, Coos County, increasing at a slower pace.

The communities of Coos Bay and North Bend represent the immediate service area for North Bend Municipal Airport with a current combined population of 25,625. The International Port of Coos Bay, the largest deep draft harbor between San Francisco and Puget Sound, is the second busiest maritime commerce center in Oregon. The Port has authority over the airport and the Foreign Trade Zone No. 132, which includes sites at four marine terminals and the airport.

Several of the area's largest employers are directly related to maritime commerce: Roseburg Forest Products, which receives timber by ship and exports plywood products; Southern Oregon Marine, a supplier of barges; and Hallmark Fisheries, a producer of seafood products.

The service sector has experienced growth over the past two decades and is represented by the largest employer in the area, the Bay Area Hospital, with its associated medical and health services. As population has grown after losses in the 1980s, so have local government and school districts increased in employment numbers to provide needed services.

Historically the area suffered economic setbacks in the recession of the 1980s. This was compounded by a loss of manufacturing jobs in the 1980s and 1990s, as a result of increased pressure to restrict timber harvests on federal lands. This had been a mainstay of the local economy. A transition is underway to diversify the economy, with emphasis on a growing tourism industry, forest and timber finishing industries, and the fisheries and agricultural sectors. Another compounding factor in the economic downturn of the area stems from the fact that many jobs are seasonally related, including agriculture, logging, construction, and tourism and are reflected by a seasonal employment ebb and flow.

Employment growth and growth in PCPI in Coos County have remained relatively slow over the recording period. Forecasts predict increases in employment at slower rates of gain than at historical levels, down from 1.53 percent to 1.13 percent. Likewise, the PCPI from 1980 to 2000 averaged 1.53 percent growth and the forecast increase in PCPI averages 1.13 percent growth. While nominal income has increased slightly, real income (or purchasing power) has remained stagnant. Job losses in high paying occupations, like manufacturing, have played a major role in this trend.

While PCPI for Coos County has increased, the percentage of capture of the total PCPI for the state of Oregon has decreased, dropping Coos County to rank 27th of 36 counties in 1995.

Expected increases in an older population, resulting from the area's attraction of the retirement community, will further reduce personal income because most seniors rely on transfer payments (Social Security, Medicare, Veteran's benefits, etc.), typically lower than wages.

TABLE 3A
Socioeconomic Forecasts
North Bend Municipal Airport

	HISTORICAL				FORECAST			
	1990	1995	1999	%Annual Average Increase 1990-99	2005	2010	2020	%Annual Average Increase 2000-20
Coos County								
Population	60,100	62,824	61,350	0.23%	62,968.00	66,759.00	71,040.00	0.70%
Employment	28,057	29,922	32,160	1.53%	32,619.00	36,313.00	40,708.00	1.13%
PCPI	$15,995	$16,634	$18,342	1.53%	$19,819	$21,078	$23,871	1.26%
State of Oregon								
Population	2,858,551	3,141,000	3,335,404	1.73%	3,613,000	3,803,000	4,177,000	1.08%
Employment	1,637,899	1,870,403	2,117,249	2.89%	2,352,479	2,536,687	2,909,949	1.53%
PCPI	$18,753	$20,099	$22,577	2.08%	$24,599	$26,218	$29,530	1.29%
City Populations								
North Bend	9,614	9,883	9,995	0.43%	na	na	na	na
Coos Bay	15,076	15,633	15,630	0.40%	na	na	na	na

na=Not Available
Source: County from Woods & Poole, CEDDS 2000; City Populations from Oregon Economic Development Department, Oct. 2000.

COMMERCIAL SERVICE FORECASTS

Commercial service activity at North Bend Municipal Airport consists of regional/commuter carriers. Regional/commuter carriers who operate aircraft with 60 seats or less are required by the FAA to file DOT Form 298-C. Carriers who operate both large aircraft with over 60 seats and smaller aircraft are required to file DOT Form 41. (Horizon Air operates smaller aircraft out of North Bend and a mix of large and small air carrier aircraft in other markets). Upon receipt of this information, the FAA is able to calculate the distribution formulae for airport improvement funds each year. Enplanement figures for CY 2000 will be used to calculate entitlements for FY 2002.

To determine the types and sizes of facilities necessary to properly accommodate present and future airline activity, two basic elements must be forecast: annual enplaned passengers and annual aircraft operations. From projections of these two indicators, peak period activity levels will be calculated and applied to various facility needs assessments in subsequent chapters of the master plan.

AIR SERVICE

North Bend Municipal Airport offers scheduled air carrier service to the southern coastal region and much of southwestern Oregon. All air service is currently provided by Horizon Air, a regional commuter owned by Alaska Airlines, and based in Seattle. Horizon has been the dominant carrier, in the local market at North Bend since the 1980s, when Horizon was a subsidiary airline of United Airlines. In 1998 Horizon changed operating aircraft from the Swearingen Metroliner, which had served its markets for the prior decade, to the De Havilland (DHC) Dash 8-200. This twin turbo prop aircraft seats 37-39 persons. Horizon flies four flights daily from North Bend to Portland, with one connecting flight daily to Seattle. These flights have exceptionally high passenger loads, averaging approximately 18 passengers per flight in 2000.

In a recent fleet upgrade, as reported in the January 15, 2001, *Aviation Week and Space Technology*, Horizon Air received the first of fifteen Bombardier Q-400 turboprop regional transports, the most recent Dash-8 series. Horizon inaugurated service of the Q-400 in February, 2001, using 70-seat aircraft on several of the high density Northwestern routes. Horizon reports that the older Dash 8-100s will be gradually retired, while retaining the newer Q-200s in addition to the newly acquired Q-400s. Routes have not yet been determined.

Air service in North Bend has fluctuated with regard to routes and scheduling. In 1990 Horizon Air offered over seventy flights per week to four destinations (Seattle, Portland, Eugene, and Salem). By 1992 the number of flights and destinations had been cut in half, only serving Portland and Eugene. Despite this period of service uncertainty, North Bend enplanements remained fairly steady.

The figures indicate steady growth in enplanements from 1990 until a slight decline in 1994. Enplanements rebounded the following year, 1995, and peaked at 20,824, according to the *FAA Terminal Area Forecast (TAF)* reports. A decline followed for the next two years. During this time service was cut to Eugene, with the, now aging Metroliner fleet, serving only Portland. Although retaining a good enplanement base for air service with over 18,000 enplanements annually, air service declined again to approximately 34 flights per week to Portland. The decline in enplanements subsided by mid 1997. The new Dash 8-200s were brought on line in early 1998. A fare promotion that coincided with the new aircraft helped to stimulate ticket sales, achieving an all time high enplanement figure of 25,188 and capturing a high 0.039 percent of the United States (U.S.) market.

This growth of enplanements, plus the stability of the consumer base, point to the stamina of the market, despite uncertain economic times in this region throughout the 1990s. In 1999 North Bend Municipal Airport surpassed the previous year's high with 29,633 enplanements, capturing 0.040 percent of the U.S. market. It is likely that 1999 enplanement statistics may have been artificially spiked by local event induced enplanements. In this case the reduction of 2000 enplanements are not seen as part of an overall downward trend in enplanements, rather an adjustment back to a more gradual increase.

ENPLANEMENT FORECASTS

Several analytical techniques have been used to examine trends in passenger growth. These have included time series extrapolation, population-based regression, and market share analysis. While the potential time frames used for regression and time series analysis can be rather extensive, the past ten-year period was considered to be a good reflection of recent trends.

The acceptability of time series or regression analysis is based upon the correlation between the data. The correlation coefficient (Pearson's "r") measures the association between changes in the dependent and independent variables. If the r-squared value (coefficient of determination) is greater than 0.95, it indicates good predictive reliability. A value below 0.95 may be used with the understanding that the predictive reliability is lower.

A time series regression was performed on historical enplanement data for the 1990-2000 time period. This provided a rather low correlation (r-squared=0.825); therefore, local enplanements were extrapolated to 2005, 2010, and 2020, with the understanding that the reliability is lower. This was the highest r-squared value in a series of attempted regressions. Therefore, it is the only regression to be used and, then, only as a trend line rather than for specific milestone identification. The remainder of the forecasts will use market share evaluations. The results of the time series regression, as indicated in **Exhibit 3C, Enplanements Forecast,** project that enplanements for North Bend Municipal Airport will increase to 35,512 enplanements by the short term (2005), 42,883 enplanements by the intermediate term (2010), and 57,623 by the long term, (2020).

The population of Coos County has been used for comparisons with aviation activity since it may in turn affect the demand for aviation services. Per capita ratios were determined between Coos County population and the number of reported enplanements. Forecasts were then extrapolated for annual enplanements for the years 2005, 2010, and 2020. As indicated in **Table 3B**, there were 0.238 enplanements per capita in 1990. By 1995, this per capita ratio had increased to 0.331. With the exception of 1996 and 1997, the ratio continued to climb, doubling the enplanement per capita ratio in 2000 (compared to that of 1990). Therefore, a forecast was developed using an increasing ratio of enplanements per capita scenario. The resulting forecast is depicted in **Table 3B** and **Exhibit 3C** as the Enplanements Per Capita - Increasing Ratio projection. (A projection at a Constant Ratio was formulated and rejected due to a relatively flat outcome, based on the

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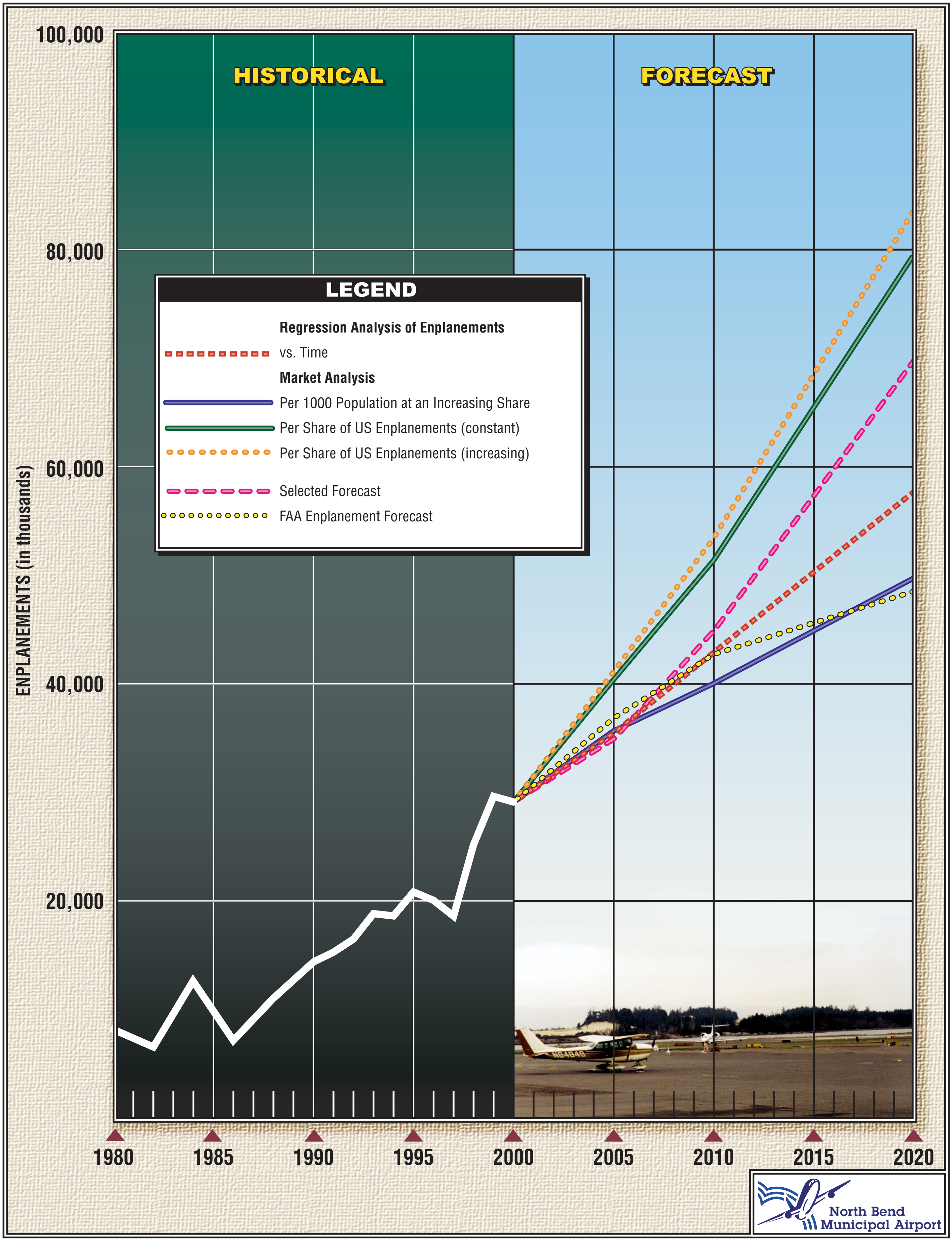

Exhibit 3C
ENPLANEMENT FORECASTS

fact that population growth projections are moderate). The ratio trend line depicts an increasing share of enplanements per capita (per one thousand population), which has historically been the pattern at North Bend. With an increasing ratio of .55, .60, and .70 (for 2005, 2010, and 2020) the forecast shows enplanements increasing from 35,646 in the short term, to 40,056 in the intermediate term, and, finally, to almost 50,000 by the long term planning period.

TABLE 3B
Enplanements Per Capita Forecast
North Bend Municipal Airport

Year	North Bend Enplanements	Coos County Population	Enplanements per Capita
1990	14,377	60,409	0.238
1991	15,283	60,887	0.251
1992	16,489	61,825	0.267
1993	18,830	62,533	0.301
1994	18,622	62,697	0.297
1995	20,824	62,824	0.331
1996	20,054	62,659	0.320
1997	18,970	62,519	0.298
1998	25,188	62,164	0.405
1999	29,633	62,593	0.473
2000	29,034	62,968	0.462
Constant Ratio Projection			
2005	32,405	64,810	0.500
2010	33,380	66,760	0.500
2020	35,520	71,040	0.500
Increasing Ratio Projection			
2005	35,646	64,810	0.550
2010	40,056	66,760	0.600
2020	49,728	71,040	0.700

Source: Enplanements from North Bend Municipal Airport records; County populations from CEDDS

The market share analysis presented in **Table 3C** indicates that North Bend's market share of the total U.S. market of regional/commuter enplanements has remained relatively constant over the past ten years. Starting with 0.038 percent of the entire U.S. Regional/ Commuter market in 1990, North Bend's share rate increases to 0.041 percent of the U.S. in 1999. With the exception of a few lower years, the figure of 0.039 percent has been very consistent. The two forecasts at constant and increasing market shares of the entire U.S. enplanements (as forecast by the FAA) are depicted in **Exhibit 3C** and **Table 3C**.

A great deal of credibility is given to the U.S. Regional/Commuter forecast as produced by the FAA. These have been studied and revised on an annual basis by aviation experts and have been historically good predictors of growth rates. With the consistency of the market shares shown over time by the enplanement statistics for North Bend, a planning projection should place added weight to these figures.

TABLE 3C
Market Share Enplanements Forecast
North Bend Municipal Airport

Year	North Bend Enplanements	U.S. Regional/Commuter Enplanements	North Bend Market Share of U.S.
1990	14,377	37,700,000	0.038%
1991	15,283	38,700,000	0.039%
1992	16,489	44,700,000	0.037%
1993	18,830	49,200,000	0.038%
1994	18,622	55,300,000	0.034%
1995	20,824	55,800,000	0.037%
1996	20,054	60,100,000	0.033%
1997	18,970	61,900,000	0.030%
1998	25,188	64,600,000	0.039%
1999	29,633	72,400,000	0.041%
2000	29,034	78,200,000	0.037%
Constant Share Projection			
2005	40,170	103,000,000	0.0390%
2010	51,363	131,700,000	0.0390%
2020	79,365	203,500,000	0.0390%
Increasing Share Projection			
2005	41,200	103,000,000	0.0400%
2010	53,339	131,700,000	0.0405%
2020	83,435	203,500,000	0.0410%

Source: North Bend Municipal Airport, as reported by regional/commuter airlines; FAA Aerospace Forecasts - FY 2000-2012 and earlier documents for 1990- 1995 data

The spread between the high and low forecasts is a reasonable window within which actual enplanement numbers may fall in the future, based upon several factors: number of local airlines, frequency, equipment, fares, non-stop destinations, and the local economy. For planning purposes, a mid-range forecast is generally chosen, if it provides a reasonable growth rate. Therefore, the selected forecast is one that closely mirrors the percent of U.S. trend at a constant ratio, but at a slightly lower value over time: 35,000 enplanements by 2005; 45,000 by 2010; and 70,000 enplanements by 2020.

FLEET MIX AND OPERATIONS FORECASTS

The fleet mix defines a number of key parameters in airport planning, including critical aircraft, stage length capabilities, and terminal gate configurations. A fleet mix projection for North Bend Municipal Airport has been developed, recognizing the changes which have taken place over the past few years in the fleet composition, and with familiarization of the most recent information available on the new aircraft being purchased by the carriers serving the airport.

TABLE 3D
Scheduled Carrier Fleet Mix and Operations Forecast
North Bend Municipal Airport

		Forecast		
Fleet Mix Seating Capacity	**Actual 2000**	**2005**	**2010**	**2020**
40-70 (55average)	0%	0%	12%	25%
20-39 (36 average)	100%	100%	88%	75%
Total	100%	100%	100%	100%
Average Seats Per Departure	36	36	38	41
Boarding Load Factor	0.56	0.55	0.56	0.57
Enplanements Per Departure	20	20	21	23
Annual Enplanements	29,034	35,000	45,000	70,000
Annual Departures	1,460	1,800	2,100	3,000
Annual Operations	2,920	3,600	4,200	6,000

Source: Horizon Air Landing Reports, as reported to North Bend Municipal Airport.

Changes in equipment, airframes, and engines have always had a significant impact on airlines and airport planning. There are many on-going programs by the manufacturers to improve performance characteristics. These programs are focusing on improvements in fuel efficiency, noise suppression, and the reduction of air emissions.

Regional/commuter airlines are transitioning to advanced turboprop aircraft and small regional jets to fit their respective market needs. The FAA views the introduction of regional jets as the most significant change in the composition of the future regional/ commuter fleet. These aircraft have greater seating capacity, stand-up headroom, and lower operating costs. A good example of this transition, as already explored in this chapter, is the recent aircraft upgrade by Horizon Air to Dash8-200 aircraft and the newly acquired Q-400 aircraft.

The long term outlook in fleet transition is dependent on traffic growth, technological improvements, and airfield facilities which can meet aircraft demands. **Table 3D** summarizes the fleet mix and operations projections.

The fleet mix projections have been used to calculate the average seats per departure, which (after applying a load factor) were used to project annual departures. The fleet mix is expected to remain the same through the short term (2005). However, seating is near capacity at the present. The short term forecast proposes an increase in departures, typically weekday flights, bringing down the load factor slightly. This load factor increases gradually from this point through the long term. Starting in the intermediate term (2010) additional aircraft offering higher seating capacity, are introduced into the fleet mix. By the long term (2020) the enplanements are forecast to be able to support further transition in the fleet mix to accommodate several flights per day that operate with higher seating capacity. This is indicated by the 25-75 mix percentage.

However, should the airlines choose not to transition to larger aircraft, then operations will increase at a faster rate. It should be noted that the projected growth in average seating capacity by 2010 closely mirrors the projections developed by the FAA at a national level.

AIR CARGO/ AIR MAIL FORECASTS

At North Bend Municipal Airport, air freight is handled by both all-cargo carriers and the scheduled passenger air carrier, Horizon Air. Air mail is solely handled by Horizon. The air cargo operations at North Bend can be segregated into four distinct areas of operations: Ameriflight, Inc., handling UPS cargo; Empire Air, which handles FedEx air cargo; Horizon Freight; and Horizon Air Mail service. The current aircraft fleet used at North Bend Municipal by the all-cargo carriers consists of Cessna 208 Caravans, operated by Empire; the Beech 1900 and the Cessna 402 operated by Ameriflight; and the Dash 8-200, operated by Horizon.

To put air cargo operations at North Bend into perspective, it is valuable to review air cargo industry trends. The air cargo industry has seen tremendous expansion over the past decade. The cargo fleet size has doubled in the past ten years to over 1,600 jet freighters. Worldwide cargo increased from 54.8 billion ton-miles in 1990 to an estimated 102.8 billion ton-miles in 2000, averaging an annual growth rate of about 6.5 percent. Over the next twenty years air freight traffic is forecast to grow at an average annual rate of about 6 percent. Although capturing less than 2 percent of the overall tonnage shipped worldwide, air freight moved 40 percent of the "high-value" goods. As immediacy and reliability are given higher priority in shipping, so will the air cargo industry continue to expand to meet this demand.

The *FAA Aerospace Forecasts- FY 2000-2011,* indicate that domestic all-cargo carrier Revenue Ton-Miles (RTMs) will increase at annual rates of 6.4 percent over the 12 year forecast period. Smaller growth is predicted for mail RTMs as electronic alternatives reduce mail volume that moves by air. Domestic mail RTMs are projected to increase at an annual rate of 3.8 percent for the domestic market.

The future levels of air freight and air mail will always be sensitive to the contracts which the individual carriers may have with local companies. The Port of Coos Bay, in addition to management of the airport, is responsible for the management and development of the international port. Recent activities include development of the Airport Business Park and the Business Enterprise Center across from the airport; deepening of the deep draft channel to make the Port of Coos Bay more commercially viable to shipping; plan development to repair the rail bridge, keeping rail service to the area; and renovation of existing facilities for the fishing and tourism industries. It is perceived that this determination and will for the port to succeed on many levels will maintain a market base that supports additional cargo operations at the airport.

Both total freight and air mail for Horizon Air, is indicated in **Table 3E**,**Horizon Air Cargo and Air Mail Forecast**. Horizon's freight numbers also indicate good, consistent cargo business both in and out of Coos County. The following **Table 3F** depicts forecasts of freight weight and operations for the all cargo aircraft at North Bend, using FAA forecasts for air cargo: 6.0 percent annual increases for air cargo and 3.8 percent for air mail. Because the reporting period for the all-cargo air carriers was limited, the forecasts are projected from the latest figures without consideration of any long-term historical trend.

TABLE 3E
Horizon Air Cargo/Air Mail Forecasts
North Bend Municipal Airport

Year	Air Freight In (lbs)	Air Freight Out (lbs)	Air Mail In (lbs)	Air Mail Out (lbs)	Annual Ops	Pounds per Operation	Total Air Freight/Mail
1995	106,020	225,198	2,096	8,633	4,118	135	341,947
1996	99,903	204,753	3,126	9,788	4,040	76	317,570
1997	78,762	200,067	2,844	4,667	3,432	83	286,340
1998	61,720	225,536	2,458	5,633	2,788	106	295,347
1999	53,863	243,533	4,126	5,148	2,708	113	306,670
2000	52,518	305,568	5,061	4,849	2,920	126	367,996
Forecast							
2005	68,000	397,000	6,600	6,300	3,540	135	478,000
2010	84,000	489,000	8,100	7,800	4,200	140	588,000
2020	116,000	672,000	11,100	10,700	6,027	134	810,000

Source: North Bend Landing Reports; Annual Operations Forecast from **Table 3D**.

Table 3F indicates the freight weight and operations for Empire Air and Amerflight. Although the cargo figures for the two private all-cargo carriers cover only part of 1999 and eleven months of 2000, they do provide a base line. What is evident is that all cargo hauling aircraft at North Bend Municipal Airport combined to move approximately 1.58 million pounds of cargo and mail in 2000.

TABLE 3F
All Cargo Carriers - Air Freight and Operations Forecast
North Bend Municipal Airport

	Empire Air			Ameriflight			
Year	Total Air Freight[1] (lbs)	Operations	Pounds/ Operation	Total Air Freight[2] (lbs)	Operations	Pounds/ Operation	Total Air Freight (lbs)
1999	296,880	282	1,067	495,419	1,264	392	792,299
2000	526,278	514	1,024	669,875	1,920	349	1,196,153
Forecast							
2005	700,000	700	1,000	864,000	2,700	320	1,564,000
2010	850,000	850	1,000	1,072,000	3,350	320	1,922,000
2020	1,200,000	1,200	1,000	1,472,000	4,600	320	2,672,000

Source: North Bend Landing Reports
[1]Empire reporting periods: 7/99-12/99, 1/00-11/00
[2]Ameriflight reporting periods: 6/99-12/99, 1/00-11/00

MILITARY OPERATIONS FORECAST

The FAA Form 5010-1, *Airport Master Record*, as recorded by the North Bend Municipal Airport, indicate that 3,342 itinerant military operations were performed at North Bend Municipal Airport in the latest recorded year. This estimate (since there is no tower), accounts for the total military activity. The reported levels of activity have remained the same through 2000. This is expected to change very little and is forecast to remain at 3,500 itinerant military operations, with no local training activity.

AIR TAXI OPERATIONS FORECAST

There is currently one FBO, Coos Aviation, on the airfield whose operations include air taxi operations. By normal definition, Air Taxi would include the Air Cargo carriers and the scheduled service carrier. However, these have been addressed previously within this text. With no control tower statistics and with no other providers of this service on the field, the estimated air taxi operations are determined to remain at 300 annual operations throughout the planning period.

It is recognized that this figure will change over the short term, by which time a contract control tower will be able to provide reliable statistics. The projections have been summarized in **Exhibit 3E, Forecast Summary**.

GENERAL AVIATION FORECASTS

General aviation is defined as that portion of civil aviation which encompasses all facets of aviation except commercial operations. To determine the types and sizes of facilities that should be planned to accommodate general aviation activity, certain elements of this activity must be forecast. These indicators of general aviation demand include: based aircraft, aircraft fleet mix, and annual operations.

BASED AIRCRAFT AND FLEET MIX PROJECTIONS

The number of based aircraft on the airport is the most basic indicator of general aviation demand. By first developing a forecast of based aircraft, the growth of other general aviation activities (and demands) can be projected. In 2000, there were 67 aircraft based on the airport. The number of based aircraft has hovered at 67 or 68 over the past five years. The fleet mix has gradually transitioned to a mix which includes higher performance aircraft. There are currently nine multi engine aircraft and one jet reported to be based on the airport.

The total number of aircraft registered in Coos County in 2000 was 157, which compares to 149 aircraft that were registered in the County in 1988. At that time North Bend Municipal Airport captured 43 percent of the County aircraft- the same as in 2000. This figure has fluctuated historically, but only slightly. This indicates a relatively stable aircraft population, with respect to County registrations.

The FAA has projected an increase in the total number of active U.S. aircraft, since it appears that the general aviation industry is in recovery, after a decade of decline. Not only are new aircraft being manufactured, but the FAA is recording an increase in operations at en route traffic control centers. The continued use of general aviation aircraft for business and corporate uses will be reflected in a rise in both the use of local aircraft registered in the Coos County area and the use of aircraft based elsewhere to access the local area.

The based aircraft projections have been summarized in **Exhibit 3D**. These have been developed using a market share projection at both constant and increasing market shares, a shown in **Table 3G**. The market share projections use the number of aircraft per 1,000 population of Coos County to project based aircraft numbers for the short term (2005), intermediate term (2010), and long term (2020). Several regressions were attempted, but failed to provide statistically reliable projections. The selected based aircraft forecast, as well as the representative fleet mix, is presented in **Exhibit 3D**.

The fleet composition is expected to continue to transition to greater percentages of turboprop, turbofans, and helicopters in the future, consistent with national trends, although single engine piston aircraft will continue to grow (more noticeably after 2005) as greater numbers of new aircraft are manufactured. A fleet mix projection has been developed in **Table 3H**.

TABLE 3G
Based Aircraft Forecast - Market Share Projection
North Bend Municipal Airport

Year	North Bend Based Aircraft	County Population	Aircraft per 1,000 Population
1980	93	63,940	1.45
1985	65	59,940	1.08
1990	64	60,410	1.06
1995	68	62,820	1.08
1998	68	62,160	1.09
1999	67	62,590	1.07
Constant Share Projection			
2005	70	64,810	1.08
2010	72	66,760	1.08
2020	77	71,040	1.08
Increasing Share Projection			
2005	71	64,810	1.10
2010	78	66,760	1.18
2020	89	71,040	1.25

Source: Enplanements from Airport records; County populations from CEDDS

TABLE 3H
General Aviation Fleet Mix Forecast
North Bend Municipal Airport

	EXISTING		FORECAST					
Type	2000	%	2005	%	2010	%	2020	%
Single Engine	51	76.12%	53	76.50%	56	76.50%	62	74.00%
Multi-Engine	9	13.43%	10	13.75%	10	13.00%	11	12.50%
Turboprop	0	0.00%	1	1.00%	2	2.00%	3	4.00%
Jet	1	1.49%	1	1.50%	2	2.00%	3	3.00%
Helicopter	5	7.46%	5	7.25%	5	6.50%	6	6.50%
Ultralight	1	1.49%	0	0.00%	0	0	0	0
Totals	67	100.00%	70	100.00%	75	100.00%	85	100.00%

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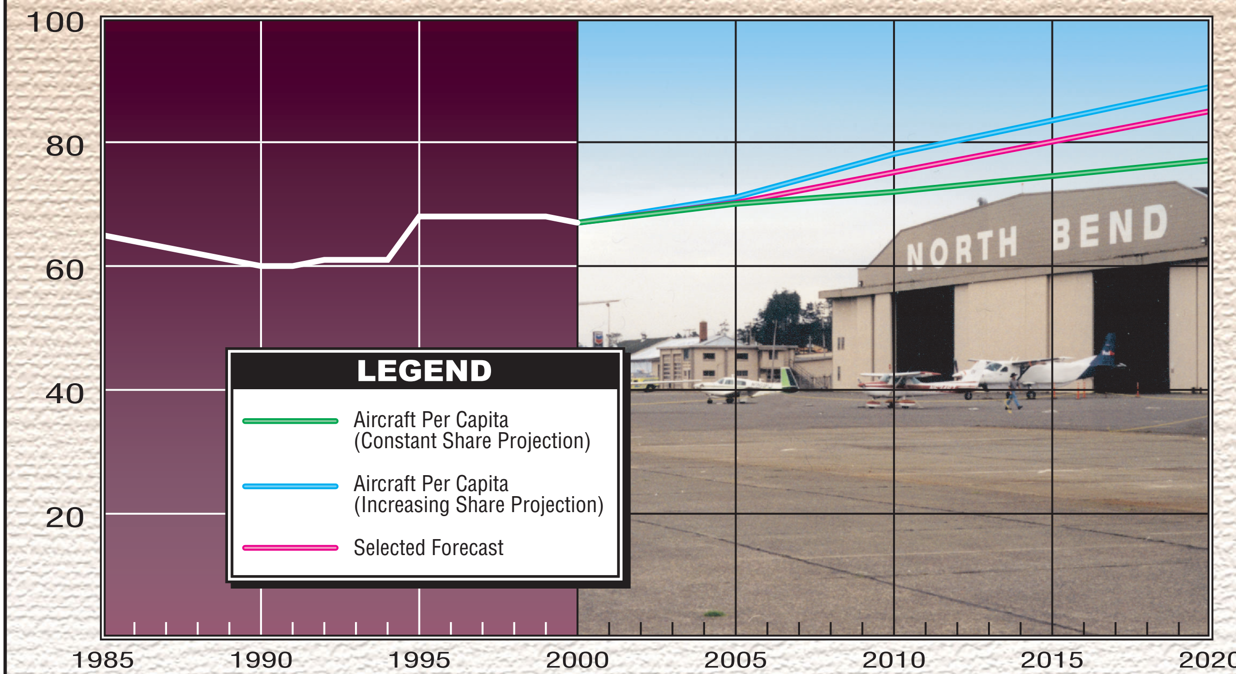
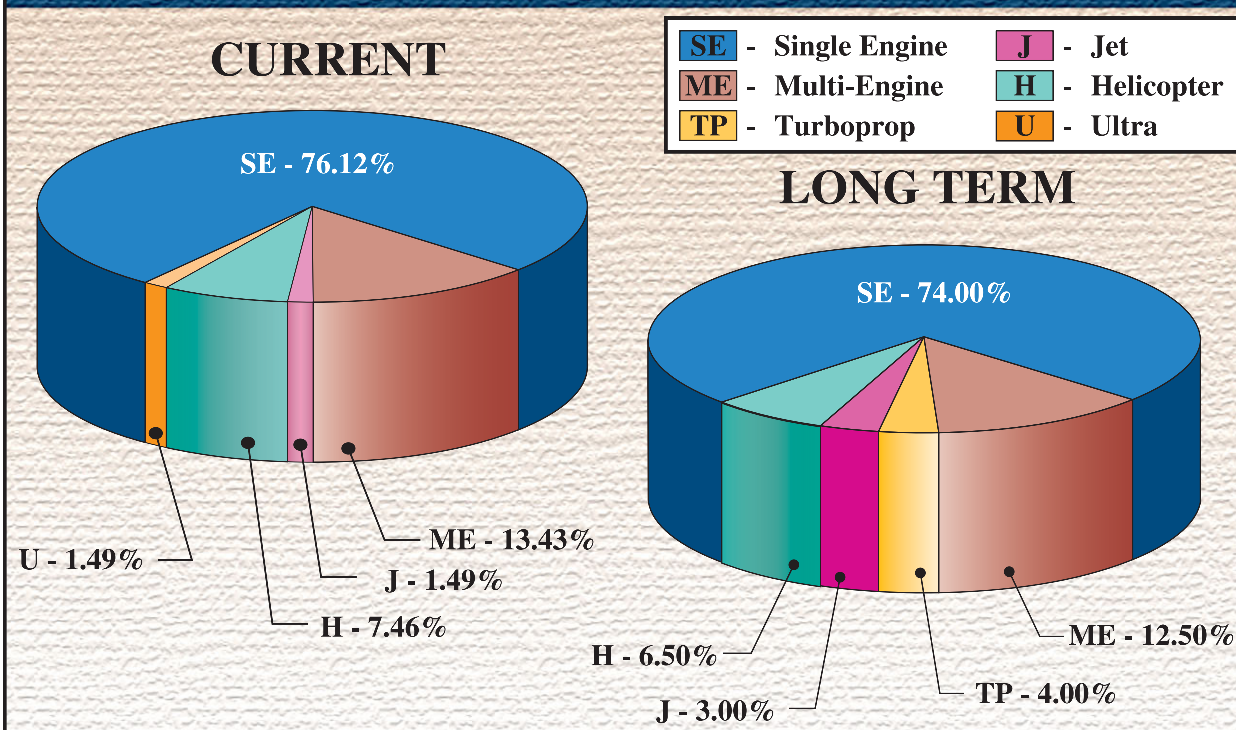
BASED AIRCRAFT



FLEET MIX BY AIRCRAFT TYPE



Source: Coffman Associates Analysis.

North Bend Municipal Airport

Exhibit 3D
BASED AIRCRAFT AND
FLEET MIX FORECAST

ANNUAL OPERATIONS PROJECTIONS

There are two types of general aviation operations at an airport: local and itinerant. A local operation is a take-off or landing performed by an aircraft that operates within site 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 operated at a higher frequency.

Operations per based aircraft (OPBA) ratios can range from 300 to 800 at airports similar to North Bend Municipal Airport. If the airport has a great deal of training activity, the OPBA ratio may be higher. In 2000, the ratio for North Bend Municipal Airport was 448 operations per 67 based aircraft, for a total 30,020 general aviation operations. The 30,020 total for the year 2000 was a significant increase over the previous year's 18,166 total general aviation operations. Itinerant general aviation operations have been categorized as large (over 12,500 pounds) or small aircraft, as presented in airport records. Local general aviation operations (as a percentage of total general aviation operations) are estimated at approximately one third of the total general aviation operations at North Bend Municipal Airport.

The forecasts indicate that local and itinerant operations will maintain a one-third/two-thirds split in operations, respectively. With a constant 500 operations per based aircraft the total general aviation operations are forecast to increase to 35,000 by the short term, 37,500 by the intermediate term, and to 42,500 by the long term. **Table 3J** summarizes the operations forecasts.

PEAKING CHARACTERISTICS

Most facility planning relates to levels of peak activity. The following planning definitions apply to the peak periods:

- Peak Month - The calendar month when peak passenger enplanements or aircraft operations occur.
- Design Day - The average day in the peak month.
- Busy Day - The busy day of a typical week in the peak month.
- Design Hour - The peak hour within the design day.

The design day is normally derived by dividing the peak month operations or enplanements by the number of days in the month. However, since commercial activity is heavier on weekdays, a 10 percent adjustment has been applied to the average day figures to reflect the peak weekday activity.

TABLE 3J
General Aviation Operations Forecast
North Bend Municipal Airport

Year	Itinerant		Local	Total GA	Based AC	Ops per Based Aircraft
	Large Itinerant	Small Itinerant				
1995	4,695	8,956	6,724	20,375	68	300
1996	3,912	9,563	6,637	20,111	68	296
1997	2,437	9,696	5,976	18,109	68	266
1998	1,647	8,690	5,091	15,428	68	227
1999	5,104	7,067	5,995	18,166	67	271
2000	5,231	14,882	9,907	30,020	67	448
General Aviation Operations Forecast						
2005	5,700	17,800	11,500	35,000	70	500
2010	6,100	19,000	12,400	37,500	75	500
2020	6,900	21,600	14,000	42,500	85	500

It is important to recognize that only the peak month is an absolute peak within a given year. All of the others will be exceeded at various times during the year. However, they represent reasonable planning standards that can be applied to future facility needs.

The peak month for passenger enplanements in 2000 was August, with 9.8 percent of the annual total. This percentage has been applied to the forecasts of annual enplanements. As indicated in **Table 3K,** the design hour enplanements were estimated at 33 percent of design day after reviewing the peak hourly departures, aircraft seating capacity, and average load factors. Peak monthly airline operations were projected at nine percent. Design hour operations were calculated at 25 percent based upon a review of the current schedule.

The peak month for general aviation operations in 2000 was August, with 10.8 percent of the annual total. The forecast of busy day operations at the airport was calculated as 1.25 times design day activity. Design hour operations were estimated at 15 percent of design day operations.

ANNUAL INSTRUMENT APPROACHES

Forecasts of annual instrument approaches (AIAs) provide guidance in determining an airport's requirements for navigational aid facilities. An instrument approach is defined by the FAA as "an approach to an airport with the intent to land by an aircraft in accordance with an instrument flight rule (IFR) flight plan, when visibility is less than three miles and/or when the ceiling is at or below the minimum initial approach altitude".

For North Bend Municipal Airport, historical data was obtained from *FAA Air Traffic Activity* (various years) and from records maintained by the Headquarters Office of the FAA in Washington, D.C. The data is recorded for fiscal years, and reflects the instrument approaches by air carrier, air taxi, general aviation, and military traffic.

TABLE 3K
Peak Period Forecasts
North Bend Municipal Airport

		FORECASTS		
	Actual 2000	**2005**	**2010**	**2020**
Airline Enplanements				
Annual	29,034	35,000	45,000	70,000
Peak Month (9.8%)	2,856	3,430	4,410	6,860
Design Day	95	114	147	228
Design Hour (33%)	31	38	49	75
Airline Operations				
Annual	2,756	3,600	4,200	6,000
Peak Month (9%)	246	324	378	540
Design Day	8	11	13	18
Design Hour (25%)	2	3	3	5
General Aviation Operations				
Annual	20,113	35,000	37,500	42,500
Peak Month (10.8%)	2,172	3,800	4,050	4,590
Busy Day	91	158	169	191
Design Day	72	127	135	153
Design Hour (15%)	11	19	20	23

In **Table 3L, Annual Instrument Approach Forecasts**, figures are shown for the historical and forecast number of annual instrument approaches, the number of total airport operations, and the percent of total airport operations that are AIAs. As the table indicates, the number of historical instrument operations fluctuates from 1996 to 1999, but shows growth over the last two years. AIAs also increased as a percent of the total airport operations.

Table 3L also indicates the percent of approaches attributable to the three aircraft categories. Based on AIAs as a percentage of total airport operations, a constant of five percent has been considered to be a reasonable average percent of total airport operations to be applied for forecast purposes. Five percent is used as a (constant) multiplier of the total forecast airport operations to arrive at the total AIAs forecasts. The average percent of total operations over the four year recorded period, is used to determine AIAs by type operation. The projections are summarized in **Table 3L**.

FORECAST SUMMARY

This chapter has outlined the various aviation demand levels anticipated over the planning period. Long-term aviation growth at North Bend Municipal Airport will be sustained by growth in the local economy and the trends experienced at the national level. In some areas, local aviation activity is expected to exceed national trends. The next step in the master planning process will be to assess the capacity of existing facilities, their ability to meet forecast demand, and to identify changes to the airfield or landside facilities which will create a more functional facility. The aviation forecasts have been summarized in **Exhibit 3E**.

TABLE 3L
Annual Instrument Approach Forecasts
North Bend Municipal Airport

	Air Carrier/Air Taxi		General Aviation		Military		
Year	**Operations**	**% of Total AIAs**	**Operations**	**% of Total AIAs**	**Operations**	**% of Total AIAs**	**Total AIAs**
1996	587	66.41%	270	30.54%	26	2.94%	884
1997	676	66.61%	256	25.22%	82	8.08%	1,015
1998	800	65.63%	352	28.88%	66	5.41%	1,219
1999	847	60.81%	473	33.96%	72	5.17%	1,393
4 Year Average		**64.86%**		**29.65%**		**5.40%**	
Forecast							
2005	1,500		690		110		2,300
2010	1,625		750		125		2,500
2020	1,885		870		145		2,900

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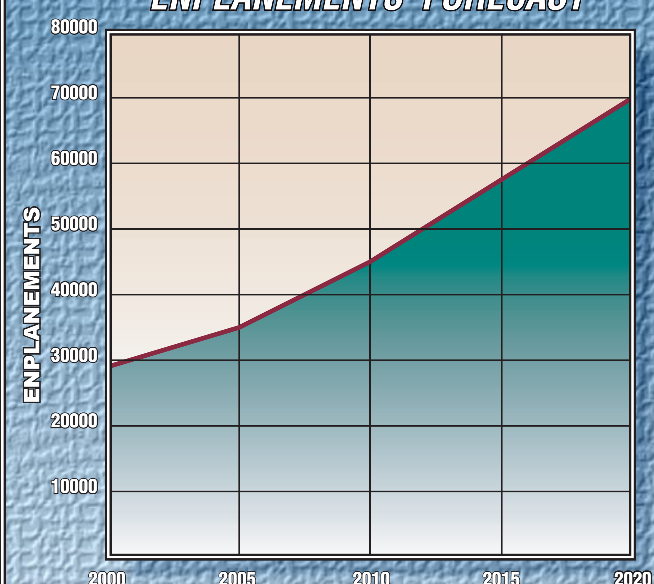
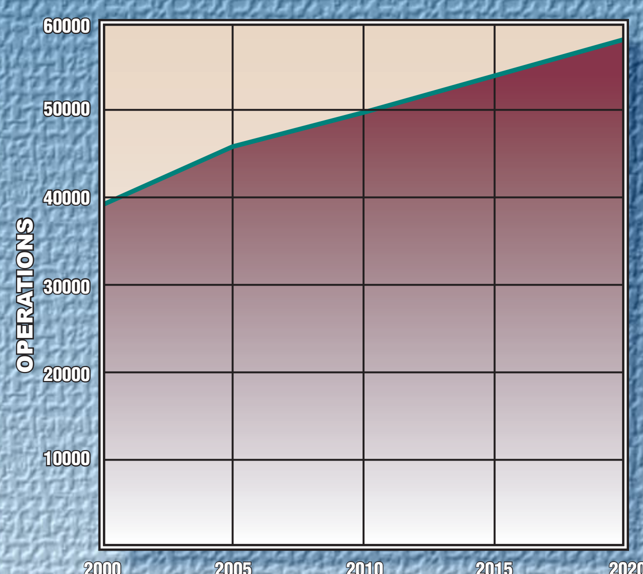
SUMMARY OF AVIATION FORECASTS

	Historical	Forecasts		
CATEGORY	**2000**	**2005**	**2010**	**2020**
ANNUAL ENPLANEMENTS				
Airport Total	**29,034**	**35,000**	**45,000**	**70,000**
ANNUAL OPERATIONS				
Itinerant				
Air Cargo	2,434	3,400	4,200	5,800
Air Carrier	2,920	3,600	4,200	6,000
Air Taxi	300	300	300	300
General Aviation	20,113	23,500	25,100	28,500
Military	3,342	3,500	3,500	3,500
Total Itinerant	**29,109**	**34,300**	**37,300**	**44,100**
Local				
General Aviation	9,907	11,500	12,400	14,000
Total Operations	**39,016**	**45,800**	**49,700**	**58,100**
ANNUAL INSTRUMENT APPROACHES (AIA's)				
Airport Total	**1,392**	**2,300**	**2,500**	**2,900**
BASED AIRCRAFT				
Single Engine	51	53	56	62
Multi-Engine	9	10	10	11
Turboprop	0	1	2	3
Jet	1	1	2	3
Helicopter	5	5	5	6
Other	1	0	0	0
Total Based Aircraft	**67**	**70**	**75**	**85**

ENPLANEMENTS FORECAST



OPERATIONS FORECAST



North Bend Municipal Airport

Exhibit 3E
FORECAST SUMMARY

North Bend Municipal Airport

Chapter Four
FACILITY NEEDS EVALUATION

Facility Needs Evaluation

To properly plan for the future of North Bend Municipal Airport, it is necessary to translate forecast aviation demand into the specific types and quantities of facilities needed to adequately serve this identified demand. This chapter uses established planning criteria to determine specific airside and landside facility requirements. Airside development includes runways, taxiways, navigational aids, and lighting. Landside development includes the passenger terminal building, aircraft parking apron, automobile parking, and hangar development. The terminal area needs will be addressed separately within this report.

The objective of this effort is to identify, in general terms, the adequacy or inadequacy of existing airport facilities, outline what new facilities may be needed, and establish when these may be needed to accommodate forecast demands. After identifying these facility requirements, alternatives for providing these facilities will be evaluated (Chapter Five). The alternatives

evaluation will help determine the most functional and efficient means for implementing further development of the facility.

AIRFIELD REQUIREMENTS

Airfield requirements include the need for facilities related to the arrival, departure, and ground movement of aircraft. The following facilities are associated with the airfield:

- Runways
- Taxiways
- Navigational and Approach Aids

The Federal Aviation Administration (FAA) has established criteria for use in

determining the appropriate size and design of airfield facilities. The selection of appropriate FAA design standards for the development of airfield facilities is based primarily upon the characteristics of the aircraft which are expected to use the airport. Planning for the design requirements of future aircraft use is particularly important because the incorrect sizing of airfield facilities could be extremely costly to modify at a later date.

The most important characteristics in airfield planning are the **approach speed** and the **wingspan** of the **critical design aircraft** anticipated to use the airport now or in the future. An aircraft's approach category is based upon 1.3 times its stall speed in landing configuration at the particular aircraft's maximum certified 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 166 knots or more.

The second basic design criterion relates to the size of an airplane. The airplane design group (ADG) is based upon wingspan. The six 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 up to but not including 262 feet.

FAA Advisory Circular 150/5300-13, Airport Design, identifies a coding system which is used to relate airport design criteria to the operational and physical characteristics of the airplanes intended to operate at the airport. This code, called the Airport Reference Code (ARC), has two components: the first component, depicted by letter, is the aircraft approach category defined above (operational characteristic); the second component, depicted by a Roman numeral, is the airplane design group also defined above (physical characteristic). **Table 4A** lists representative aircraft per ARC category and grouping.

Generally, aircraft approach speed applies to runway length, while airplane design group primarily relates to separation criteria involving taxiways and taxilanes. In order to determine facility requirements, the Airport Reference Code (ARC) should first be determined, and then the airport design criteria as contained within *AC 150/5300-13* can be applied. **Exhibit 4A** provides a listing of typical aircraft and their associated ARC.

00MP11-4A-12/10/01

A-I

Beech Baron 55
Beech Bonanza
Cessna 150
Cessna 172
Piper Archer
Piper Seneca

C-I, D-I

Lear 25, 35, **55**
Israeli Westwind
HS 125

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

Gulfstream II, **III**, IV
Canadair 600
Canadair Regional Jet
Lockheed JetStar
Super King Air 350

B-II
less than 12,500 lbs.

Super King Air 200
Cessna 441
DHC Twin Otter

C-III, D-III

Boeing Business Jet
B 727-200
B 737-300 Series
MD-80, DC-9
Fokker 70, 100
A319, A320
Gulfstream V
Global Express

B-I, II
over 12,500 lbs.

Super King Air 300
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
DC-8-70
DC-10
MD-11
L1011

A-III, B-III

DHC Dash 7
DHC Dash 8-200
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.

North Bend Municipal Airport

Exhibit 4A
AIRPORT REFERENCE CODES

TABLE 4A
Representative General Aviation Aircraft by ARC
North Bend Municipal Airport

Airport Reference Code	Typical Aircraft	Approach Speed (knots)	Wingspan (feet)	Maximum Takeoff Weight (lbs)
	Single Engine Piston			
A-I	Cessna 150	55	32.7	1,600
A-I	Cessna 172	64	35.8	2,300
A-I	Beechcraft Bonanza	75	37.8	3,850
	Turboprop			
A-II	Cessna Caravan	70	52.1	8,000
A-III	Dash 8-200	–	85.0	36,300
	Multi Engine Piston			
B-1	Beechcraft Baron	96	37.8	5,500
B-1	Piper Navajo	100	40.7	6,200
B-1	Cessna 421	96	41.7	7,450
	Turboprop			
B-1	Mitsubishi MU-2	119	39.2	10,800
B-1	Piper Cheyenne	119	47.7	12,050
B-1	Beechcraft King-Air B-100	111	45.8	11,800
	Business Jets			
B-1	Cessna Citation I	108	47.1	11,850
B-1	Falcon 10	104	42.9	18,740
	Turboprop			
B-II	Beechcraft Super King Air	103	54.5	12,500
B-II	Cessna 441	100	49.3	9,925
	Business Jets			
B-II	Cessna Citation II	108	51.7	13,330
B-II	Cessna Citation III	114	53.5	22,000
B-II	Cessna Citation Bravo	114	52.2	15,000
B-II	Cessna Citation Excel	114	55.7	19,400
B-II	Cessna Citation Ultra	109	52.2	16,500
B-II	Falcon 20	107	53.5	28,660
B-II	Falcon 900	100	63.4	45,500
	Business Jets			
C-1	Lear 55	128	43.7	21,500
C-1	Rockwell 980	137	44.5	23,300
C-1	Lear 25	137	35.6	15,000
	Turboprop			
C-II	Rockwell 980	121	52.1	10,325
	Business Jets			
C-II	Cessna Citation X	-	64	34,500
C-II	Canadair Challenger	125	61.8	41,250
C-II	Gulfstream III	136	77.8	68,700
	Business Jets			
D-I	Lear 35	143	39.5	18,300
D-II	Gulfstream II	141	68.8	65,300
D-II	Gulfstream IV	145	78.8	71,780

The FAA recommends designing airport functional elements to meet the requirements of the most demanding ARC for that airport. Airline, military, or corporate jet aircraft currently utilizing the airport fall into Approach Category B and C (approach speeds less than 141 knots), and within Groups I, II, or III, (wingspans up to 171 feet). The most demanding aircraft wingspan currently operating is the Dash 8-200 (A-III). Projections for the highest ARC aircraft may include the replacement aircraft for Horizon Air's Dash 8-200, the Q100 or Q200 (each a 39-seat aircraft with an ARC B-III) or the Q400 (70 seats with an ARC C-III). Corporate jets will fall within B-I, C-I, B-II, C-II, and D-II categories, defining the critical approach speed.

The existing ARC for Runways 4-22 and 13-31 at North Bend Municipal Airport is B-III. Runway 16-34, proposed by the *1997 Master Plan* for future closure, is currently maintained as ARC B-I. ARC C-III design standards provide a primary runway length which accommodates Approach Category A, B, and C aircraft, and provide separation distances between airfield elements which accommodate the Group III critical aircraft. This ARC serves all general aviation aircraft, military, and commercial aircraft currently serving (or forecast to serve) the airport.

The following airfield facilities are outlined to describe the scope of facilities that would be necessary to accommodate the airport's role throughout the planning period. The airfield facility requirements outlined in this chapter correspond to the design standards described in the *AC150/5300-13*.

RUNWAYS

The adequacy of the existing runway system was analyzed from a number of perspectives including airfield capacity, runway orientation, runway length, runway width, and pavement strength. From this information, requirements for runway improvements were determined for the airport.

Airfield Capacity

A demand/capacity analysis measures the capacity of the airfield facilities (i.e. runways and taxiways) for the purpose of identifying and planning for additional system needs. The capacity of the airport was determined using *FAA Advisory Circular (AC) 150/5060-5, Airport Capacity and Delay* for the configuration of a dual, intersecting runway system: Runways 4-22 and 13-31. As previously mentioned Runway 16-34 is little used, proposed for closure, and, therefore, not considered as contributing to airport capacity. Pursuant to *FAA AC 150/5060-5,* the annual service volume of an intersecting runway configuration normally exceeds 230,000 annual operations. Annual operations forecasts (long term = 58,100) determine that the airfield operations will not exceed capacity within the planning period.

FAA Order 5090.3B Field Formulation of the National Plan of Integrated Airport Systems (NPIAS) indicates that improvements should be considered when operations reach 60 percent of the airfield's annual service volume (ASV). Even if the projected long range planning horizon level of operations comes to fruition prior to projections, the airfield's ASV will not exceed the 60 percent level by the long range planning horizon. Therefore, no additional airfield improvements aimed at increasing airfield capacity will be required for the planning period. Improvements which will enhance airfield efficiency, such as taxiway improvements, however, may be necessary and may also improve airfield capacity in the future.

Runway Orientation

The runway system at the airport includes primary Runway 4-22 and secondary Runways 13-31 and 16-34. Runway 4-22 is oriented in a northeast-southwest direction. Runway 13-31 is oriented in a northwest-southeast direction. The third and least used is Runway 16-34, the north-south runway. Runway orientation has been analyzed according to various crosswind components and calculated for all-weather conditions. **Table 4B** summarizes wind coverage data for the airport as determined from **Exhibits 4B and 4C**.

FAA design standards recommend additional runway orientations when the primary runway orientation provides less than 95 percent wind coverage. As indicated, the combination of Runways 4-22 and 13-31 achieve a 98.23 percent wind coverage at a crosswind velocity of 10.5 knots and 99.98 percent coverage at a crosswind velocity of 20 knots. All combined the runways achieve 100 percent coverage with 20 knot cross-winds. As **Table 4B** indicates, and airport records confirm, Runway 13-31 is the favored runway for prevailing winds. Use of Runway 4-22 increases with the onset of IFR weather conditions, as all precision instrument approaches with the lowest minimums (ILS 4, GPS 4, and MLS 22) are determined for this runway.

Runway Length

The determination of runway length requirements is based upon five primary factors:

- Critical aircraft type expected to use the runway
- Stage length of the longest non-stop trip destination
- Mean maximum temperature of the hottest month
- Airport elevation
- Runway gradient

Aircraft performance declines as elevation, temperature, and runway gradient factors increase. Calculations of runway length requirements at North Bend Municipal Airport consider the airport elevation of 17 feet above mean sea level (MSL) and a mean maximum daily temperature of 67.1° F for the hottest month of the year (August). For runways accommodating approach category C and D aircraft, a maximum of 1.5 percent runway gradient is allowed. The existing runway gradient for each of the two main runways is below 1.0 percent. The two main runways are Runway 4-22 (length 5,330') and Runway 13-31 (length 4,820'). Runway 16-34 is 2,300 feet in length.

The current mix of aircraft operating at the airport include jet aircraft such as the locally based Falcon 2000. The turboprop mixture of aircraft determining critical aircraft as the Dash 8-200, Beech 1900, Cessna 402, and the Cessna 208 Caravan. Regional aircraft in the future may include the Q series Dash 8 turboprop or regional jet.

TABLE 4B
Wind Coverage Summary
North Bend Municipal Airport

Wind Speed	Runway 4-22 All-Weather	Runway 13-31 All-Weather	Combined Coverage (Runways 4-22/13-31) All-Weather	Runway 16-34 All-Weather	Combined Coverage (All Runways) All-Weather
10.5 knots	84.42%	94.28%	98.23%	96.13%	99.81%
13 knots	89.39%	97.04%	98.91%	98.09%	99.96%
16 knots	94.90%	99.12%	99.86%	99.49%	99.99%
20 knots	98.27%	99.78%	99.98%	99.86%	100.00%

Observation Period: 1991 - 2000, North Bend Municipal Airport, North Bend, Oregon

The critical aircraft on the airfield operate at relatively short stage lengths, but in some cases, high gross weights. Regional corporate jets use the airport with some frequency. The forecast (both nationwide and at North Bend) is for the regional jet traffic to make up an increasing percentage of the entire U.S. fleet.

The fleet mix forecast for North Bend Municipal Airport shows the addition of several regional jets through the long term planning period. Whereas passenger air traffic (both existing and future routes) will be confined to locations within the Northwest Region, regional jets will operate with stage lengths of up to 2,000 miles.

Therefore, in determining runway length requirements for the airport, stage lengths of 2,000 miles for jets were assumed. The Falcon 2000 is a based jet having over 500 annual operations. This ARC B-II aircraft is typical of the jet traffic experienced at the airport. According to airport records other itinerant jets include: the Gulfstream II, III and IV; Citation II, III and X, Lear 25 and 35, and an occasional Boeing 737, which is limited as to the weight at which it can land. Generally, this grouping of aircraft will be classified as ARC B-II, C-II and occasionally D-II.

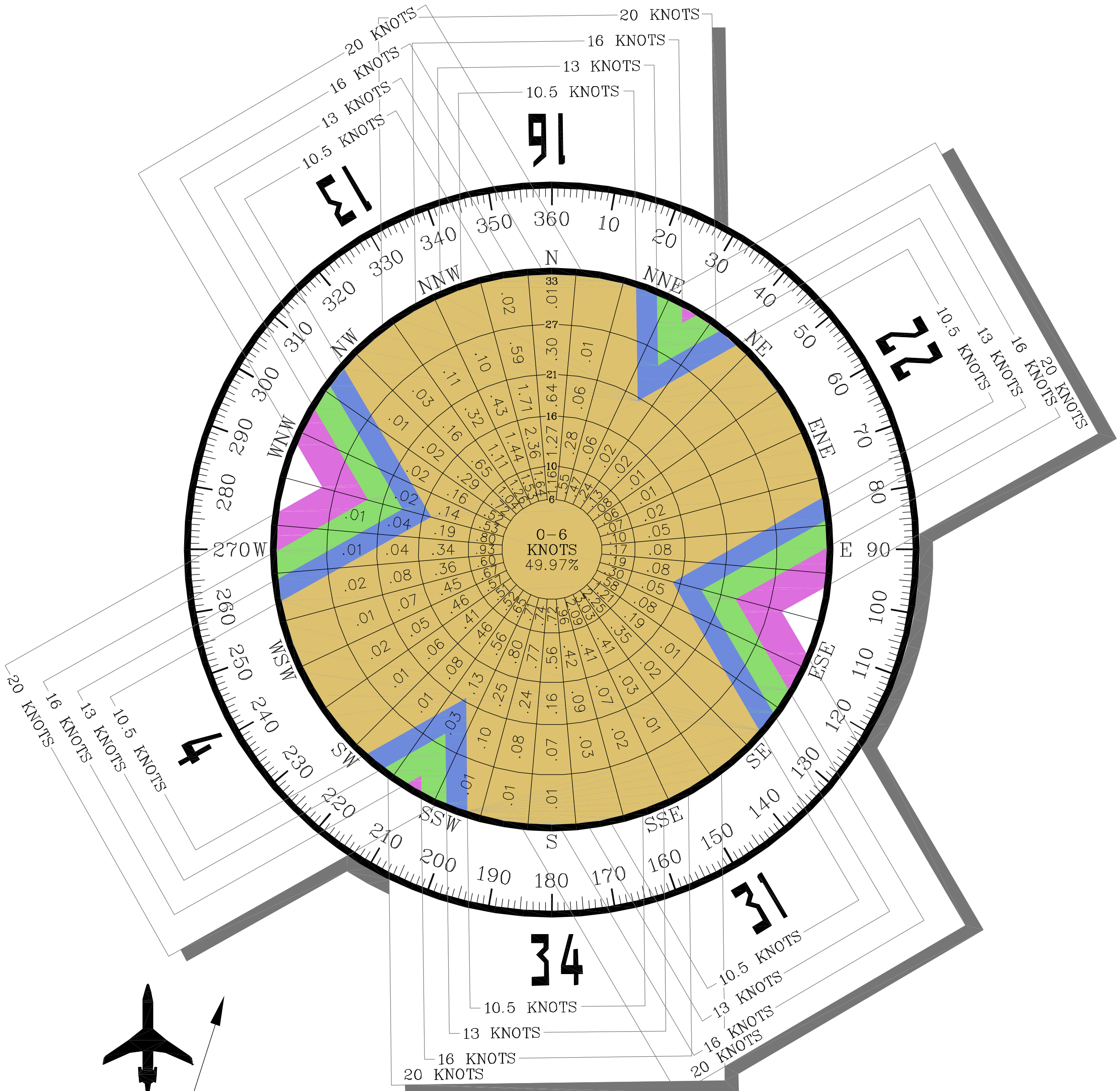
The FAA's design software (Version 4.2A) was used to verify length requirements, which are summarized in **Table 4C**. For 75 percent of aircraft weighing less than 60,000 pounds, at 60 percent useful load, the program recommends a minimum of 5,230 feet, which is met by the current primary runway length.

Runway Width

The width of each of the existing runways was also examined to determine the need for facility requirements. Currently, all runways are 150 feet wide. This width accommodates the requirement for ADG III, which will only be necessary on Runway 4-22through the planning period.

ALL WEATHER WIND COVERAGE

Runways	10.5 Knots	13 Knots	16 Knots	20 Knots
Runway 4-22	84.42%	89.39%	94.90%	98.27%
Runway 13-31	94.28%	97.04%	99.12%	99.78%
Runway 16-34	96.13%	98.09%	99.49%	99.86%
Runways 4-22/13-31	98.23%	99.91%	99.86%	99.98%



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

OBSERVATIONS:
80,973 All Weather Observations
1991-2000

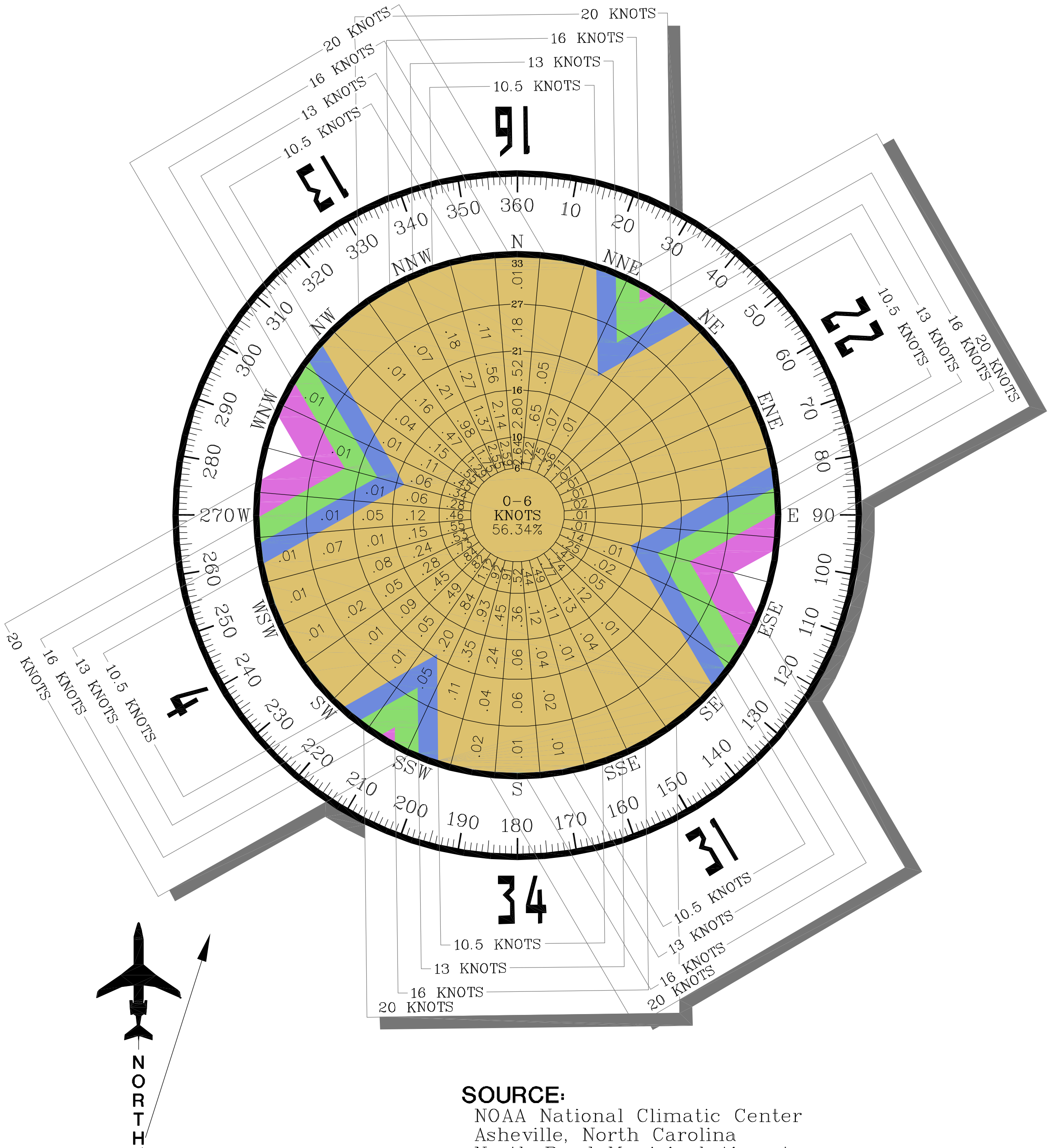
Magnetic Variance
17° 36' East (April 2001)
Annual Rate of Change
3.84' West (April 2001)

North Bend Municipal Airport

Exhibit 4B
ALL WEATHER WIND ROSE

IFR WIND COVERAGE

Runways	10.5 Knots	13 Knots	16 Knots	20 Knots
Runway 4-22	*87.75%*	*92.58%*	*97.23%*	*99.06%*
Runway 13-31	*95.08%*	*97.33%*	*99.07%*	*99.70%*
Runway 16-34	*97.64%*	*98.86%*	*99.56%*	*99.80%*
Runways 4-22/13-31	*98.44%*	*99.49%*	*99.89%*	*99.99%*



Magnetic Variance
17° 36' East (April 2001)
Annual Rate of Change
3.84' West (April 2001)

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

OBSERVATIONS:
8,496 IFR Observations
1991-2000

North Bend Municipal Airport

Exhibit 4C
IFR WIND ROSE

TABLE 4C **Runway Lengths, FAA Design Software**	
Airport elevation	16 feet
Mean daily maximum temperature of the hottest month	67.10 F.
Maximum difference in runway centerline elevation	5 feet
Length of haul for airplanes of more than 60,000 pounds	2,000 miles
Wet and slippery runways	
RUNWAY LENGTHS RECOMMENDED FOR AIRPORT DESIGN	
Small airplanes with approach speeds of less than 30 knots	300 feet
Small airplanes with approach speeds of less than 50 knots	800 feet
Small airplanes with less than 10 passenger seats	
75 percent of these small airplanes	2,280 feet
95 percent of these small airplanes	2,810 feet
100 percent of these small airplanes	3,330 feet
Small airplanes with 10 or more passenger seats	3,870 feet
Large airplanes of 60,000 pounds or less	
75 percent of these large airplanes at 60 percent useful load	**5,230 feet**
75 percent of these large airplanes at 90 percent useful load	6,620 feet
100 percent of these large airplanes at 60 percent useful load	5,460 feet
100 percent of these large airplanes at 90 percent useful load	7,000 feet
Airplanes of more than 60,000 pounds	Approximately 7,610 feet
REFERENCE: Chapter 2 of *AC 150/ 5325-4A, Runway Length Requirements for Airport Design*, Change 4 included.	

Pavement Strength

The most important feature of airfield pavement is its ability to withstand repeated use by aircraft of significant weight. The current strength rating on Runway 4-22 is 106,000 pounds single wheel loading (SWL), 113,000 dual wheel loading (DWL), and 190,000 pounds dual tandem wheel loading (DTL). This strength rating is sufficient for the fleet of aircraft currently serving and expected to serve the airport in the future.

For Runway 13-31, the current strength rating is 124,000 pounds SWL , 186,000 DWL, and 335,000 pounds DTL. This strength rating is sufficient to accommodate the loading requirements of the aircraft currently serving, and expected to serve, the airport in the future, including large aircraft.

The current strength rating for Runway 16-34 is 45,000 pounds SWL, 60,000 DWL, and 100,000 pounds DTL and is able to serve the majority of aircraft that use the airport.

TAXIWAYS

Taxiways are primarily constructed to facilitate aircraft movements to and from the runway system. Parallel taxiways greatly enhance airfield capacity and are essential to aircraft movement about an airfield. The two most critical design considerations for taxiways are **runway-taxiway separation distance** and **width**.

Runway 4-22 is supported by a partial parallel taxiway (Taxiway C) which is offset 325 feet from runway centerline to taxiway centerline. Four connecting taxiways provide access to Taxiway C. These will be sufficient to meet demand through the planning period, based upon the wingspan of the critical aircraft: 93.25 feet for the Q400, which meets Group III design standards, requiring a runway-taxiway separation distance of 246.6 feet. (The standard for a Group III taxiway-runway separation is typically 350'. Calculations are based on the Group III standard for the critical aircraft as cited above.)

Runway13-31 is supported by a full-length parallel taxiway (Taxiway A), which is also offset 325 feet from runway centerline to taxiway centerline. Other than a taxiway shared with Runway 4-22 (Taxiway C1), there are five taxiways connecting the runway system to the ground facilities. These will be sufficient through the planning period.

Runway 16-34 does not have a parallel taxiway and is not proposed for one. Access is provided by taxiing onto connecting Taxiway B and back taxiing for takeoff from Runway 16. Taxiway E is aligned with the extended centerline of Runway 16 accessing the south general aviation area and the Coast Guard facility.

The design standards for taxiways are based on the wingspan of the critical aircraft using the runway associated taxiway. Aircraft using Runways 4-22 and 13-31 include those in Group III design standards, which require a taxiway width of 50 feet. This standard is met by each parallel taxiway and all of the connecting taxiways, with the exception of Taxiway K, which is 37 feet and is located at the south end of Runway 13-31, adjacent to the south general aviation hangar.

Holding aprons provide an area for aircraft to prepare for departure in a way that does not obstruct other aircraft. The departure end of Runway 4 is equipped with a holding apron. There are no other holding aprons specifically designated on the airport.

AIRFIELD MARKING, LIGHTING AND SIGNAGE

In order to facilitate the safe movement of aircraft about the airfield, airports use pavement markings, lighting and signage to direct pilots to their destinations. Runway markings are designed according to the type of instrument approach available on the runway. *FAA AC 150/5340-1H, Marking of Paved Areas on Airports*, provides the guidance necessary to design airport markings.

Runway 4-22 has the necessary precision runway markings for the ILS, GPS, and MLS instrument approaches that serve the runway. Basic markings exist on Runways 13-31 and 16-34. Non-precision markings should be considered for Runway 13-31. Basic markings will suffice for Runway 16-34 through the planning period. Hold lines and markings for Runways 4-22 and 13-31 should be upgraded, including glass beads for:

1) Runway side stripes;
2) Taxiway edge markings;
3) Displaced threshold markings; and
4) Demarcation base.

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 terminal apron and general aviation apron surfaces 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.

Airport lighting systems provide critical guidance to pilots during nighttime and low visibility operations. Runway 4-22 is equipped with high intensity runway edge lighting (HIRL), while Runway 13-31 is equipped with medium intensity runway edge lighting (MIRL). Runway 16-34 is not lighted. These systems will be adequate for the planning period.

Effective ground movement of aircraft at night is enhanced by the availability of taxiway lighting. Medium intensity taxiway lighting (MITL) is in place on taxiways, with edge lighting or reflectors in use on taxilanes. The existing airfield lighting systems, while adequate in intensity, will need routine maintenance and upgrades during the planning period.

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. Signs located at intersections of runways and taxiways provide crucial information to avoid conflicts between moving aircraft. Directional signage instructs pilots as to the location of taxiways and terminal aprons. Airfield signage has been updated (1993) to reflect current FAA standards and should be adequate through the planning period.

NAVIGATIONAL AND APPROACH AIDS

Electronic and visual guidance to arriving aircraft enhance the safety and capacity of the airfield. Such facilities are vital to the success of the airport, and provide additional safety to passengers using the air transportation system. While instrument approach aids are especially helpful during poor weather, they are often used by commercial pilots when visibility is good. The North Bend Municipal Airport has six published approaches, three of which are precision approaches.

Instrument approaches are categorized as either precision or nonprecision. Precision instrument approach aids provide an exact alignment and descent path for an aircraft on final approach to a runway while non-precision instrument approach aids provide only runway alignment information. Most existing precision instrument approaches in the United States are instrument landing systems (ILS).

With the advent of the Global Positioning System (GPS), stand-alone instrument assisted approaches will eventually be established that provide vertical guidance down to visibility minimums currently associated with precision runways. As a result, airport design standards that formerly were associated with a type of instrument procedure (precision/non-precision) are now revised to relate instead to the designated or planned approach visibility minimums. It is expected that future instrument approaches to the airport will involve the use of GPS to provide vertical guidance and runway alignment information with visibilities of three-fourths mile or less.

Existing Instrument Approaches

Precision instrument approaches are available to Runways 4 and 22. The ILS approach to Runway 4 is the approach having the lowest ceilings and visibility minimums, allowing aircraft to land in IFR weather with ceilings as low as 200 feet and visibility reduced to three-fourths mile. The other approaches range from 500 feet and one mile to 1,100 feet and three miles and are provided by the North Bend (OTH) VOR/DME, Emire NDB, and GPS transmitter.

Global Positioning System

The advancement of technology has been one of the most important contributing factors in the growth of the aviation industry. Much of civil aviation and aerospace technology has been derived and enhanced from the initial development of technological improvements for military purposes. The use of orbiting satellites to confirm an aircraft's location is the latest military development to be made available to the civil aviation community.

The FAA has already approved the publication of thousands of "overlay" GPS instrument approach procedures. Stand-alone GPS approaches using the Wide Area Augmentation system (WAAS) will gradually be phased in to provide Category I approaches (estimated 2015-2020), while Local Area Augmentation Systems (LAAS) will provide Category I/II/III approaches. Approach lighting and runway lighting systems will continue to be required for the desired approaches.

Approach Lighting

Approach lighting systems provide the basic means to transition from instrument flight to visual flight for landing. Runway 4 has a four light visual approach slope indicator (VASI-4) system on the right hand side of the runway. Runway 31 has a four light precision approach path indicator (PAPI-4) approach, located to the left of Runway 31. The addition of a medium intensity approach lighting system (MALS) with runway alignment indicator lights (RAIL), or MALSR, and a runway visual range (RVR) visibility reporting system would result in the improvement of the ILS approach from three/fourths mile visibility to a CAT I capabilities.

The New Generation RVR systems are capable of reporting the RVR of a runway down to the lowest CAT III limits (150 feet), determined by spacing of the baseline transmitting stations. A two hundred-foot spacing would achieve a RVR between 800 and 3,000 feet. Justification for the improved approach is determined by the percentage of IFR weather experienced. Based on previous weather data, IFR weather and below IFR weather conditions are experienced at North Bend Municipal Airport ten percent of the time. The two percent of weather conditions that are below minimums (and that currently preclude airport use) would be reduced by the addition of the RVR. Scheduled air carrier service would respond with fewer cancelled flights and landings at alternate destinations. Reliability is an often cited contributor to passenger satisfaction, which in turn generates higher enplanements for the air carrier.

Approach improvements to Runway 22 were considered in an effort to provide an alternative to the approach to Runway 31. However, existing obstructions would hinder approaches by all but light single engine aircraft.

Visual Approach Aids

In most instances, the landing phase of any flight must be conducted in visual conditions. To provide pilots with visual guidance information during landings to the runway, electronic visual approach aids are commonly provided at airports. As mentioned, the existing visual approach aids consist of a four-box visual approach slope indicator (VASI-4) for Runway 4 and a PAPI-4 for Runway 31. Consideration should be given to installation of precision approach path indicators (PAPI-4) on Runway 13 and 22. As most airports are replacing older VASIs with the PAPI system, Runway 4 should also consider a PAPI-4 system to replace the VASI.

Runway end identifier lights (REILs) are flashing lights that facilitate identification of the runway end. Runways 4 and 13 are presently equipped with REILs. Both Runways 22 and 31 should also be equipped with runway end identifier lights (REILs).

Air Traffic Control

The airport sponsor, the Oregon International Port of Coos Bay, has requested the FAA to consider installation of a contract airport traffic control tower (ATCT). An initial cost/benefit ratio determination found that the airport was eligible for 68 percent funding. More recent traffic counts indicate that the ATCT may be eligible for 100 percent funding in the near future. The airport management staff continues to work with the FAA on this issue. A control tower will improve the safety of aircraft operations and increase the reliability of air service, especially in the poor visibility conditions frequently encountered in late summer and early fall. These factors directly impact passenger confidence and enplanement levels.

Airfield requirements have been summarized in **Exhibit 4D.**

TERMINAL AREA REQUIREMENTS

Components of the terminal area complex include the terminal apron, airline gate positions, and the various functional elements within the terminal building. In addition, the terminal area is served by various access, auto parking, and rental car facilities. The various terminal complex functional areas and needs are presented in a separate section within this report.

GENERAL AVIATION LANDSIDE REQUIREMENTS

The purpose of this section is to determine the landside space requirements for general aviation hangar and apron parking facilities during the planning period. In addition, the total surface area needed to accommodate general aviation activities through the planning period is estimated. These requirements are summarized in **Exhibit 4E**.

HANGARS

The demand for hangar facilities typically depends on the number and type of aircraft expected to be based at the airport. For planning purposes, it is necessary to estimate hangar and apron facilities based on peak design periods. However, hangar and apron development should be based on actual demand trends and financial investment conditions.

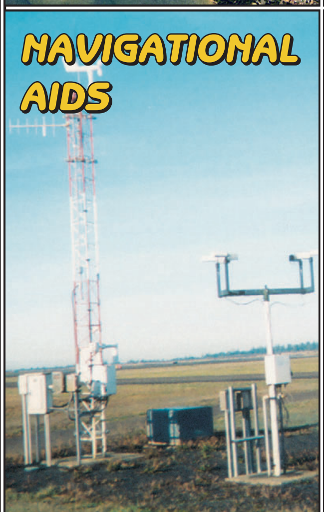
Typical utilization of hangar space varies across the country as a function of local climate conditions, airport security, and owner preferences. Although most of the based aircraft at the airport are hangared, weather is not the only factor that influences the demand for hangar storage. The trend for general aviation aircraft, whether single or multi-engine, is in larger, more sophisticated and expensive aircraft. Owners of these types of aircraft normally desire hangar space to protect their investment.

Determining hangar requirements involves estimating the area necessary to accommodate the required hangar space. For conventional hangars, a planning standard of 1,100 square feet for single-engines and 2,000 square feet for twin-engine, jet, and helicopters was used. Since portions of conventional hangars are also used for aircraft maintenance and servicing, requirements for service hangar area were estimated using a planning standard of approximately 15 percent of the total hangar space needs.

Table 4D compares existing hangar availability and utilization to the future hangar requirements for the planning period. Future hangar requirements are supported by the forecast of based aircraft. The facilities requirements for these aircraft are, then, determined by the division of hangar facilities typically demanded by the fleet mix of aircraft. In the case of North Bend Municipal Airport this division of facilities would be based on a presumption of facility development in replacement of the existing 70,000 square foot conventional hangar facility. In reality this may happen at anytime during the planning period or sometime beyond it. However, the eventual replacement should be anticipated and new hangar facilities planned.

As the table indicates, of the existing 67 based aircraft, 49 are hangared. A total of 87 hangar spaces are available on the field, made up of 14 T-hangar spaces, 17 executive hangar spaces, and 56 conventional hangar spaces. Twenty three of the 56 spaces in the large conventional hangar are in use. Therefore, it is easy to recognize that especially the single engine aircraft driven demand for T-hangar space will be supplied, to some extent, by the large amount of available space within the conventional hangar. The more expensive, higher performance aircraft

00MP11-4D-12/10/01

	EXISTING	SHORT-TERM	LONG-TERM
RUNWAYS & TAXIWAYS 	**Runway 4-22** 5,330' x 150' 106,000 # SWL, 113,000 # DWL, 190,000 # DT Partial Parallel Taxiway C Exit Taxiways C1, C2, C3, C4, D **Runway 13-31** 5,045' x 150' 124,000 # SWL, 186,000 # DWL, 335,000 # DT Parallel Taxiway A Exit Taxiways A1, A2, A3, A4 **Runway 16-34** 2,300' x 100' 45,000# SWL, 60,000 # DWL, 100,000 # DT Taxiway B, E	**Runway 4-22** SAME SAME SAME SAME **Runway 13-31** Narrow to 100' SAME SAME **Runway 16-34** Close	**Runway 4-22** SAME SAME Full length parallel taxiway SAME **Runway 13-31** SAME SAME SAME SAME **Runway 16-34** SAME SAME SAME
NAVIGATIONAL AIDS 	ILS, VOR, NDB, GPS, AWOS **Runway 4-22** ILS - 4 GPS A, B (Circle-to-land) NDB 12 VOR/DME - 4 MLS - 22 **Runway 13-31** None **Runway 16-34** None	ATCT **Runway 4-22** SAME add: RVR and MALSR - 4 Remove MLS **Runway 13-31** GPS - 31 **Runway 16-34** None	SAME **Runway 4-22** SAME **Runway 13-31** SAME **Runway 16-34** None
LIGHTING & MARKING 	Rotating Beacon MITL **Runway 4-22** HIRL REIL - 4 VASI - 4R (4) Precision Marking **Runway 13-31** MIRL REIL (13) PAPI - 4L (31) Basic Marking **Runway 16-34** No Lighting Basic Marking	SAME SAME **Runway 4-22** SAME REIL (22) PAPI (22) SAME **Runway 13-31** SAME SAME/REIL (31) SAME/PAPI - 4L (13) Nonprecision Marking (13-31) **Runway 16-34** SAME SAME	SAME SAME **Runway 4-22** SAME SAME SAME SAME **Runway 13-31** MIRL SAME SAME SAME **Runway 16-34** SAME SAME

North Bend Municipal Airport

Exhibit 4D
AIRFIELD FACILITY REQUIREMENTS

AIRCRAFT STORAGE HANGARS

	AVAILABLE	SHORT TERM NEED	INTERMEDIATE NEED	LONG TERM NEED
T-hangar Positions	14	40	42	50
Executive Hangar Positions	17	18	20	23
Conventional Hangar Positions	56	12	13	15
Total Positions	87	70	75	88
T-hangar Area (s.f.)	15,400	43,700	46,200	55,400
Executive Hangar Area (s.f.)	42,500	33,800	37,600	43,400
Conventional Hangar Area (s.f.)	70,000	15,100	16,100	18,300
Maintenance Area (s.f.)	8,600	13,900	15,000	17,600
Total Hangar Area (s.f.)	136,500	106,500	114,900	134,700

APRON AREA

	AVAILABLE	NEED	SHORT TERM NEED	INTERMEDIATE NEED	LONG TERM NEED
Single/Multi Engine Aircraft Positions	77	5	9	10	11
Apron Area (s.y.)	36,100	3,700	6,400	6,900	7,800
Transient Jet Positions	-	3	4	4	5
Apron Area (s.y.)	-	5,100	6,681	7,191	8,160
Locally-Based Aircraft Postions	43	5	5	5	5
Apron Area (s.y.)	7,000	2,900	2,900	2,900	2,900
Total Positions	120	13	18	19	21
Total Apron Area (s.y.)	43,100	11,700	15,981	16,991	18,860

North Bend Municipal Airport

Exhibit 4E
LANDSIDE REQUIREMENTS

will still create demand for private facilities, whether T-hangar or executive style hangar. The table indicates that no new facilities are immediately required. However, determination of the future of the large conventional hangar, built in the 1940's, should be made. This will bear on the need for intermediate and long range facilities.

TABLE 4D
Aircraft Storage Hangar Requirements
North Bend Municipal Airport

				Future Requirements		
	Currently Available	**Currently Leased**	**Current Need** (based on typical hangar requirements)	**2005**	**2010**	**2020**
Aircraft to be Hangared	67	-	-	70	75	80
T-Hangar Positions	14	9	36	40	42	50
Executive Hangar Positions	17	17	16	18	20	23
Conventional Hangar Positions	56	23	15	12	13	15
Hangar Area Requirements						
T-Hangar Area (s.f.)	15,400	9,900	40,000	43,700	46,200	55,400
Executive Hangar Storage Area	42,500	42,500	30,100	33,800	37,600	43,400
Conventional Hangar Storage Area	70,000	28,750	17,300	15,100	16,100	18,300
Total Maintenance Area	8,600	8,600	13,100	13,900	15,000	17,600
Total Hangar Area (s.f.)	136,500	89,750	100,500	106,500	114,900	134,700

AIRCRAFT PARKING APRON

A parking apron should provide for the number of locally-based aircraft that are not stored in hangars, for those aircraft used for continual training activity, and for itinerant aircraft, especially as seasonal tourism is promoted in the area and may result in summer peaks in usage.

A planning criterion was applied to the number of itinerant busy day spaces (25 percent of busy day operations) to determine future local and transient apron requirements: 560 square yards per aircraft for locally based aircraft, 700 square yards for single and multi engine itinerant aircraft, and 1,700 square yards for itinerant jets. The aircraft used by air cargo carriers are mixed with the other general aviation aircraft, and share ramp areas. The results of this analysis are presented in **Table 4E.** The current general aviation apron area consists of 36,100 square yards. The amount of general aviation apron should be sufficient through the planning period.

SUPPORT REQUIREMENTS

Various facilities that do not logically fall within classifications of airfield, terminal building, or general aviation areas have also been identified. These other areas provide certain functions related to the overall operation of the airport, and include: aircraft rescue and firefighting, fuel storage, and airport maintenance facilities.

TABLE 4E
General Aviation Parking Apron Requirements
North Bend Municipal Airport

	Available	Current Need (based on typical apron requirements)	2005	2010	2020
Single, Multi Engine Transient Aircraft Positions	77	5	9	10	11
Apron Area (s.y.)	36,100	3,700	6,400	6,900	7,800
Transient Jet Aircraft	*	3	4	4	5
Apron Area (s.y.)	*	5100	6681	7191	8160
Locally-Based Aircraft Positions	43	5	5	5	5
Apron Area (s.y.)	7,000	2,900	2,900	2,900	2,900
Total Positions	120	13	18	19	21
Total Apron Area (s.y.)	43,100	11,700	15,981	16,991	18,860

* Included in figures for Single, Multi Engine

AIRCRAFT RESCUE AND FIREFIGHTING

Requirements for aircraft rescue and firefighting (ARFF) services at an airport are established under *Federal Aviation Regulations (FAR) Part 139*. *FAR Part 139* applies to the certification and operation of land airports served by any scheduled or unscheduled passenger operation of an air carrier using aircraft with more than 30 seats. Paragraph 139.315 establishes ARFF index ratings based on the length of the largest aircraft with an average of five or more daily departures. The airport operates as an Index "B" facility. The two Oshkosh fire and rescue units meet Index "B" requirements. The Port is replacing the smaller vehicle with a new one with a capacity of 1,500 gallons of water, aqueous film forming foam (AFFF), and holding 500 pounds of dry chemical powder.

The ARFF facility is located in a separate building just north of the terminal, providing quick response capability. In addition to the vehicle, a new ARFF building has been proposed for 2001.

AIRPORT MAINTENANCE FACILITIES

The airport maintenance is performed by the Oregon International Port of Coos Bay. The maintenance facilities are located behind the FBO (Coos Aviation), adjacent to the main apron. The equipment storage area is limited and may need additional area. This may be able to be accommodated within the vacant space elsewhere on the field.

FUEL STORAGE

The aviation fuel storage facility is run by the fixed base operator (FBO), Coos Aviation. Jet-A is stored in a 12,000 gallon tank and supported with a 3,400 gallon fuel truck. The tank capacity for 100LL is 21,000 gallons, supported by a 2,900 gallon fuel truck. Sufficient area should be reserved for future expansion of the fuel farm.

SUMMARY

The facility needs evaluation has identified several requirements on the airfield, in the public parking areas, and in general aviation segments. Each of these functional areas will be given consideration in the following evaluation of airport development alternatives. The next chapter will provide analysis and recommend the best alternative for the future development of the airport, taking into consideration such other factors as access and highest and best use of airport properties.

Chapter Five
AIRPORT DEVELOPMENT ALTERNATIVES

North Bend Municipal Airport

Airport Development Alternatives

In the previous chapter, the airside and landside facility needs that would satisfy projected demand over the planning period have been identified. The next step in the master planning process is to evaluate the various ways these facilities can be provided. A series of airport development alternatives are presented for comparison, which meet airfield and landside needs. Subsequently, a master plan concept will be recommended.

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

The combination of alternatives can be limitless, therefore, only the more prudent and feasible alternatives have been examined. The alternatives presented in this chapter will be reviewed with the Planning Advisory Committee to allow for further refinement. Then, a master plan concept will be recommended in conjunction with airport layout plans and capital improvement programs.

While the evaluation of airport development alternatives may include the "no action" or "no build" alternative, this alternative will eventually reduce the quality of services provided to the public and potentially affect the North Bend/Coos Bay area's ability to accrue additional economic growth. However,

a final decision with regard to pursuing a particular development plan which meets the needs of commercial and general aviation users rests with the airport sponsor.

While this study does not deal with the potential relocation of services to other airports, this option also exists. It would be difficult to duplicate the services and convenience of the current facility at a nearby airport. Likewise, the economic and environmental costs of new site development are generally far greater than the cost of developing the existing site. It is sometimes possible to relocate, or encourage the relocation of some services. However, most of the services which local users find attractive are not easily met at nearby airports. Therefore, the master planning process must attempt to deal with the facility needs which have been identified in the previous chapter and provide a logical decision path which the Oregon International Port of Coos Bay can follow.

BACKGROUND

The last master plan was completed in 1997. The Master Plan identified the Dornier 328 (DO-328) as the critical aircraft. Since that time the commercial aircraft serving North Bend Municipal Airport that has replaced the DO-328 is the 37-seat DeHavilland Dash 8-200 (newer models termed Q200) aircraft. This effectively creates the need for the airport to upgrade to B-III facilities. Horizon Air, the current air carrier service provider, is in the process of updating its fleet from the Dash 8-100 and Dash 8-200 to the Q200, Q400 (70 seats), and Canadair Regional Jet 700 (70 seats). Since the long term forecasts for North Bend Municipal Airport include the possibility of a 70-seat aircraft, such as the Q400, being added to the fleet mix, the ARC C-III is calculated using the design specifications of this aircraft.

The Port of Coos Bay has completed several of the recommendations of the last master plan, having constructed the T-hangar, rehabilitated the main apron, undertaken improvements to Taxiway B and associated taxilanes, and installed signage and fencing.

INITIAL DEVELOPMENT CONSIDERATIONS

It is the overall objective of this effort to provide for a balanced airside and landside complex to serve forecast aviation demands. However, prior to defining specific alternatives, development objectives should be reviewed.

The Oregon International Port of Coos Bay provides the overall guidance for the operation and development of North Bend Municipal Airport. Therefore, it is of primary concern that the airport is marketed, developed, and operated for the betterment of the entire area. With this in mind, the following objectives have been defined:

- Develop an attractive, efficient, and safe aviation facility.
- Promote increased use of the airport for transportation of air passengers by providing the necessary support facilities for both passengers and airlines.

- Encourage increased general aviation use of the airport by promoting increased business and corporate use of the airport.

In attempting to meet these objectives, development of facilities should be undertaken in such a manner as to minimize operational constraints. Flexibility in airport development is essential in assuring adequate capacity while minimizing financial commitments until market potential is realized. This flexibility has been incorporated within the alternatives presented in this chapter, as airside and landside considerations addressing the facility requirements (identified within the previous chapter) have been noted on **Exhibit 5A**.

AIRFIELD DESIGN CONSIDERATIONS

The airfield system requires the greatest commitment of land area and has a significant impact over the identification and development of alternatives for all other facilities. Furthermore, aircraft operations dictate the FAA design criteria that must be considered for airport improvement. The airport should be designed to accommodate the critical aircraft. Safety area design standards and adjacent non-aviation facilities can ultimately limit the design of an airport. These criteria, and how they are applied, will impact the viability of various alternatives. The following describes the specific requirements considered in the development of the airfield alternatives.

RUNWAY-TAXIWAY REQUIREMENTS

Analysis in the previous chapter indicated that the runway system provides adequate length and weight bearing capacity for the critical aircraft. Likewise, the runway can accommodate the predominance of business aircraft which currently operate and are forecast to operate at the airport.

The previous chapter indicated that the combination of existing critical aircraft used for airport design (Dash-8 200, A-III and multiple business jets, typically B-II) determine an ARC B-III. In addition to meeting FAA standards for runway length, ARC C-III runway/taxiway separation requirement for the future critical aircraft (246.6 feet for the Q400) is met by the 325-foot separation distance on Runway 4-22. Runway 13-31 will remain B-III.

Again, as stated earlier, if not designed to meet the specific critical aircraft, the typical B/C-III runway/taxiway separation distance of 350 feet is recommended. This would require taxiway movement by 25 feet and come within the boundaries of the water treatment facility along the south edge of Runway 4-22. This fact, coupled with the presence of the hill to the south and Coos Bay to the north, may limit the ability of the airport to meet design standards of airplanes with greater wingspans, without considerable expense. However, this does not in any way preclude the itinerant use of the airport by such aircraft (fewer than 500 annual operations), as individual aircraft design allows.

The *FAA Advisory Circular 150-5300-13, Through Change 6, Airport Design,* indicates that the minimum runway width for ARC B-III aircraft is 100 feet. Accommodation for larger aircraft (C-IV, D-IV) should be maintained at North Bend Municipal Airport, as the primary Runway 4-22 is already equipped with a 150-foot runway width. An example of a C-IV aircraft already operating at North Bend Municipal Airport on a limited basis, is the C-130 (used by the Coast Guard). However, the added 50-foot width is not required for the secondary Runway 13-31.

The airport meets taxiway width requirements of 50 feet with all, but one general aviation taxiway (Taxiway K - 37 feet). Therefore, further upgrades in width are unnecessary.

RUNWAY SAFETY AREAS

The design of airfield facilities includes both the pavement areas to accommodate landing and ground operations of aircraft as well as safety areas to protect aircraft operational areas and keep them free of obstructions which could affect the safe operation of aircraft at the airport. The safety areas include the runway safety area (RSA) and object free area (OFA).

The FAA defines the OFA as "a two dimensional ground area surrounding runways, taxiways, and taxilanes which is clear of objects except for objects whose location is fixed by function (i.e. airfield lighting"). The RSA is defined as "a defined surface surrounding the runway prepared or suitable for reducing the risk of damage to airplanes in the event of an undershoot, overshoot, or excursion from the runway."

Furthermore, the FAA has placed a higher significance on maintaining adequate RSAs at all airports due to recent aircraft accidents. Under *Order 5200.8*, effective October 1, 1999, the FAA established a Runway Safety Area Program. The Order states, "The goal of the Runway Safety Area Program is that all RSAs at federally obligated airports and all RSAs at airports certificated under 14 CFR Part 139 shall conform to the standards contained in *Advisory Circular 150/5300-13, Airport Design*, to the extent practical." Under the Order, each Regional Airports Division of the FAA is obligated to collect and maintain data on the RSA for each runway at federally obligated airports.

The airfield currently conforms to FAA's design criteria for RSAs considering ARC C-III aircraft on Runway 4-22; however, Runway 13-31 does not meet B-III RSA requirements. The airport is currently engaged in the Runway 13-31 Runway Safety Area Project to correct that deficiency. Both the RSA and OFA requirements for Runways 4-22 and 13-31 are depicted on **Exhibit 5B and 5C** and noted in **Table 5A**. FAA standards require these areas to be under the control of the airport to ensure that these areas are kept clear of objects which could be hazardous to aircraft operations.

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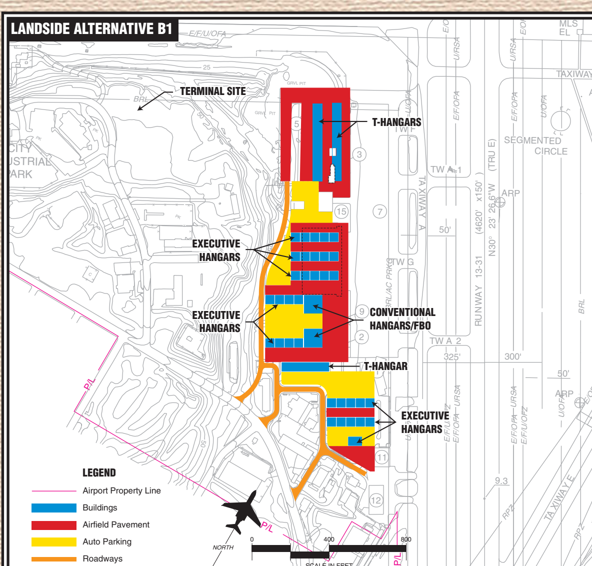
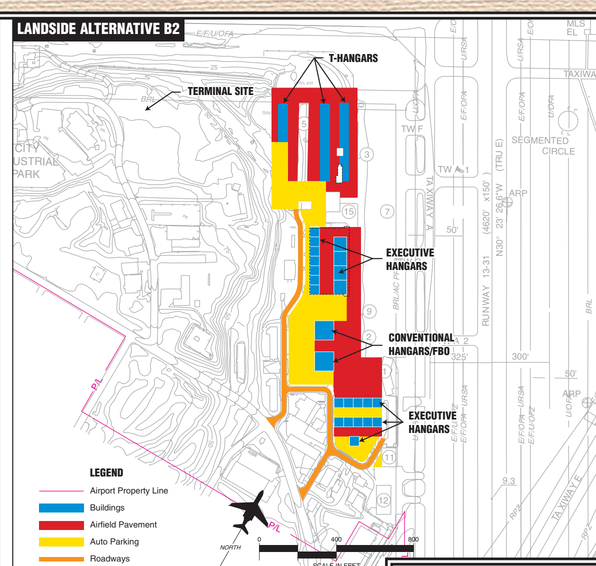
AIRFIELD CONSIDERATIONS

- Locate Airport Traffic Control Tower
- Complete Parallel Taxiway/Add Exits
- Upgrade Approaches to Runway 4-22:
  - RVR Runway 4/22
  - MALSR Runway 4
- Vacate Runway 16-34.
- Upgrade to Precision Markings (4-22)
- Upgrade Visual to Non-Precision Markings (13-31)
- Hold Line Markings - Both Runways

LANDSIDE CONSIDERATIONS

- Coordinate with ATCT and Terminal Siting
- Evaluate Existing Hangar Needs/ Future Development Locations
- Evaluate Access Road Needs





North Bend Municipal Airport

Exhibit 5A
INITIAL DEVELOPMENT CONSIDERATIONS

00MP11-5B-6/20/01

Exhibit 5B
EXISTING STANDARDS AND MINIMUMS (ARC B-III)

Exhibit 5C
FUTURE STANDARDS AND MINIMUMS (ARC C-III)

TABLE 5A Future Safety Area Dimensional Standards North Bend Municipal Airport	ARC C-III		ARC B-III	
Runway	**4**	**22**	**13**	**31**
Runway Safety Area				
Width	500	500	300	300
Length Beyond Runway End	1,000	1,000	600	600
Object Free Area				
Width	800	800	800	800
Length Beyond Runway End	1,000	1,000	600	600
Runway Protection Zone - Not Lower Than One Mile Visibility				
Inner Width		500	500	500
Outer Width		1,010	700	700
Length		1,700	1,000	1,000
Runway Protection Zone - Cat I Minimums				
Inner Width	1,000			
Outer Width	1,750			
Length	2,500			
Sources: FAA Airport Design Software Version 4.2D; FAA AC 150/5300-13, Through Change 6				

RUNWAY PROTECTION ZONES

Another consideration is the FAA requirement for cleared protection zones. The runway protection zone (RPZ) is a trapezoidal area centered on the runway beginning 200 feet beyond the runway end. The RPZ is a two-dimensional area and has no associated approach surface. The dimensions of the RPZ vary according to the visibility minimums serving the runway and, in some instances, the type of aircraft operating on the runway.

FAA design standards limit the types of development within the RPZ to development which is compatible to aircraft operations. FAA design standards prefer to limit residential and other types of development which can cause the congregation of people on the ground. Typically, compatible development includes agricultural land uses, golf courses (although consideration is being given to limiting golf course development due to bird strike considerations) or surface parking lots and roadways.

Exhibit 5C depicts the layout of the airfield considering ARC C-III design aircraft with the proposed approach improvements. The only change from existing standards occurs to the Runway 4 RPZ, as Category I approach standards dictate.

AIRFIELD ALTERNATIVES

Airfield alternatives that are designed to accomplish the objectives stated above, while addressing future facility requirements, include:

- **Location of the Airport Traffic Control Tower (ATCT).** As a need for a permanent ATCT has been identified, further study must be undertaken to determine the best location of the facility. Although not meant to supplant the need for an Airport Traffic Control Tower Siting Study, several logical alternative sitings are proposed within this report. The following are operational and spatial requirements per *FAA Order 6480.4, Airport Traffic Control Tower Siting Criteria*, used to generally locate potential ATCT sites:

Mandatory Siting Requirements

a. There must be maximum visibility of the airport traffic patterns.

b. There must be a clear, unobstructed, and direct view of all approaches to all runways or landing areas and to all runway and taxiway surfaces.

c. The proposed site must be large enough to accommodate current and future building needs including employee parking spaces.

d. The proposed tower must not violate FAR Part 77 surfaces unless it is absolutely necessary.

e. The proposed tower must not derogate the signal generated by any existing or planned electronic facility.

(Further nonmandatory requirements were consulted in proposing the new tower sites. The alternative sites are discussed further in the following section, ***LANDSIDE ALTERNATIVES)***.

- **Completion of the parallel Taxiway C (Runway 4-22).** *FAA Advisory Circular 150/5300-13* recommends a full length parallel taxiway system for each runway. The proposed improvement would extend Taxiway C, providing a full length system. Addition of a connector taxiway, aligned with parallel Taxiway A, is also proposed. This maintains a more effective right angle exit system and allows for better separation of traffic between the two parallel taxiways.

- **Upgrading of the approaches to Runway 4-22 by adding Runway Visual Range (RVR) capability and installing a Medium Approach Lighting System with Runway Alignment Indicator Lighting (MALSR).** Upgrading the approach minimums for Runway 4 to Category I requires installation of a RVR system capable of reporting near real time visibility conditions for the approach runway and the MALSR.

- **Vacating Runway 16-34 and a Portion of Taxiway B east of Runway 13-31.** Runway 16-34 is the least used runway at the airport. With exception to U.S. Coast Guard helicopter activity, the runway functions as little more than a long taxiway. Although this runway has the best alignment with prevailing winds, there exists little possibility of upgrade from the current length of 2,300 feet. It is proposed that this runway be vacated rather than undergo rehabilitation, which appears to be necessary based upon the recent airfield pavement study.

- **Upgrading Non-Precision Markings for Runway 4-22 to Precision Markings.** This upgrade is consistent with the upgrade of the approach to a Category I approach.

- **Upgrading Visual Markings for Runway 13-31 to Non-Precision.** This upgrade is consistent with the instrument approach minimums of not less than one mile and for better use as the alternative runway if weather or runway closure of the primary runway require its use.

- **Upgrade of Hold Lines and Markings for Runways 4-22 and 13-31.** All markings and hold lines should be upgrade, including glass beading for runway side stripes, taxiway edge markings, displaced threshold markings, and the demarcation base, and to bring them into compliance with upgraded runway and taxiway standards.

- **Reduction in width of Runway 13-31 from 150 feet to 100 feet.** The width of 150 feet for the crosswind Runway 13-31 is not required for B-III ARC design. The runway may function equally well with less expense for maintenance at a width of 100 feet.

LANDSIDE DESIGN CONSIDERATIONS

The primary landside facilities to be accommodated at North Bend Municipal Airport include aviation related facilities such as the commercial passenger terminal (dealt with in a separate section of this report), general aviation terminal building, aircraft storage hangars, access road locations, and siting of the ATCT. The interrelationship of these functions is important to defining a long term landside layout for the airport.

To a certain extent landside uses should be grouped with similar uses or uses that are compatible. Other functions should be separated, or at least have well defined boundaries for reasons of safety, security, and efficient operation. Finally, each landside use must be planned in conjunction with the airfield, as well as ground access that is suitable to the function.

Runway frontage should be reserved for those uses with a high level of airfield interface, or need for exposure. Other uses with lower levels of aircraft movements, or little need for runway exposure can be placed in more isolated locations.

In addition to the functional capability of the airport, the proposed development concept should provide a first class appearance for North Bend Municipal Airport. Consideration to aesthetics should be given to the entryway as well as public areas when arranging the various activity areas. Architecturally pleasing buildings and landscaping, as well as corporate aircraft found in the high activity areas, should be featured in these areas when possible.

Typically, airports face development constraints of one degree or another because of their basic function, causing the alternatives analysis to focus upon specific layouts of landside facilities. This holds equally true for North Bend Municipal Airport. The airport is bound on the north and east by Coos Bay, the west side by the overlooking hillside and the city's water treatment facility south of Runway 4-22, and on the south by roads and non airport industrial/ commercial property.

The airport planning efforts should maximize existing property in an efficient manner that will serve demand well beyond the 20-year planning period as well as provide flexibility for marketing and development. In order to provide a functional facility which meets all potential development needs, areas best suited for specific development should be identified. Essential development elements to serve airfield and general aviation needs must be considered, as noted above and include support functions such as airport maintenance, ARFF, and fuel storage.

Following a review of the development alternatives by the Planning Advisory Committee and the sponsor, a land use plan will be developed which defines the highest and best uses for property at North Bend Municipal Airport considering functional needs, regulatory requirements and development potential and needs.

In general the following areas of need and concern determine the landside alternatives proposed:

Existing Conventional Hangar. The large hangar, constructed in 1942, currently has space for 56 aircraft. At some point in time the facility will exceed its life cycle cost. Each alternative offers redevelopment choices that can be made either in the short or long term that replaces the large hangar storage spaces. The airport should determine from current demand whether the redevelopment should take the form of T-hangar, executive hangar, a combination of these, or even reuse for development of the main passenger terminal facility/apron area as Alternative C depicts.

Commercial Passenger Terminal. Although not a part of this chapter, the passenger terminal and accessory facilities have been generally located on the following exhibits in order to allow placement of the remaining landside facilities.

ATCT Site. With FAA Siting Requirements taken into consideration, three alternatives for the location of the ATCT are depicted and are discussed below.

Hangar Storage Requirements. Aircraft storage needs are considered, taking into account the facilities identified in the previous chapter. Each alternative addresses the need for approximately:

- 50 T-hangar spaces
- 23 Executive hangar spaces
- 15 Conventional hangar spaces

Access to Facilities. Road improvements are considered in each alternative that better access proposed facilities.

LANDSIDE ALTERNATIVES

The following landside alternatives are designed to accomplish the objectives stated earlier in the chapter narrative, while addressing future facility requirements. Air cargo operations are currently accommodated within the general aviation areas. This is not expected to change with new facilities or with an expected increase in cargo operations as apron area is sufficient. Any future based cargo operation may choose to construct facilities within the executive style hangar areas depicted on the exhibits.

LANDSIDE ALTERNATIVE A

In **Exhibit 5D**, Landside Alternative A, the terminal is shown in the same general area as currently exists, but allows for expansion or relocation within that area. The commercial apron area would expand within the same general area. Parking areas are shown for possible use as short term, long term, and employee/auto rental areas.

The general aviation areas are shown adding 38 storage spaces in three T-hangars, thirteen executive storage hangars, and one conventional hangar, storing 15 aircraft. The T-hangars are assumed to be needed earliest and may be developed adjacent to the existing 14 space T-hangar. The east T-hangar may be developed partially allowing the existing FBO office and hangar and the airport maintenance building to remain. At such time when the existing large hangar is removed, a new conventional hangar may house FBO and aircraft maintenance facilities.

In this alternative the general aviation activities are separated from the commercial activities. The new ARFF would be placed adjacent to the new terminal. The ATCT can be sited at the old site and accessed by continuing the new road. This alignment of the road allows for more parking for the general aviation areas and may be installed on an as needed basis.

LANDSIDE ALTERNATIVE B

Exhibit 5E shows Landside Alternatives B1 and B2. The alternatives depict the same basic layouts for the passenger terminal and general aviation areas, with the difference being location of an access road further west, with slightly varied utilization of the additional space.

The passenger terminal site, located upon the hill, may also accommodate the ATCT within its structure, using the height advantage for visibility.

Location of the terminal in this manner allows for greater expansion of hangar facilities and in a way that does not press for a disposition of the old hangar, as all type hangars may be built concurrent with needs. The construction of two conventional hangars allows FBO offices, aircraft maintenance, and aircraft storage needs to be met. In both scenarios the existing passenger terminal is removed. Executive hangars are proposed within the existing terminal parking area, but would not be proposed for construction until the long term.

Alternative B1 adds 40 storage spaces in four T-hangars, 34 executive storage hangars, and two conventional hangars, storing 20 aircraft. Alternative B2 adds 35 storage spaces in three T-hangars, 22 executive storage hangars, and two conventional hangars, storing 20 aircraft.

LANDSIDE ALTERNATIVE C

Alternative C, shown on **Exhibit 5F**, depicts a development scenario based on the location of a new terminal within the envelope of the old large hangar. This alternative allows reuse of the existing passenger terminal for the FBO, locating a conventional hangar alongside for aircraft maintenance and storage. The passenger terminal parking is partially retained, adding executive hangars in the long term.

Although this scenario allows adaptive reuse of the old terminal, it also effectively separates general aviation into three separate areas on the airfield. This would create a taxiing pattern in which aircraft cross the commercial air carrier apron area to reach the FBO and refueling area.

In Alternative C the ATCT may be located in any of the three locations. An access road is shown for the use of general aviation and that may be continued to access the old ATCT site.

Alternative C adds 28 storage spaces in two T-hangars, 11 executive storage hangars, and one conventional hangar, storing 15 aircraft.

AIRPORT TRAFFIC CONTROL TOWER ALTERNATIVES

In addition to the *FAA Mandatory Siting Requirements* previously noted, there are other requirements both mandatory and nonmandatory, that must be considered. For any site analysis line of sight considerations are paramount. Minimum eye elevations must be sited in accordance with *FAA Order 6480.4*. Sites should also take into account local weather patterns, flight patterns in relationship to sunrise and sunset coordinates, and the locations of building masses that may obstruct visibility. Additionally, controllers should not be required to cross active aircraft operating areas. Future development needs must be considered, as the expense of locating a ATCT should not have to be repeated. Discussions with local personnel and officials may also have important bearing on the site location.

The three site locations proposed are depicted on **Exhibit 5G.** Site 1 locates the ATCT upon the hill, presumably collocating with the terminal. This site may require additional cab height to achieve views over the aviation facilities. Much of the aircraft maneuvering could be hidden from view and within shadows, especially that cast by the large hangar.

Site 2 is a previous ATCT location. This site allows good views along the flight line and along the primary runway. Again views may be slightly obstructed looking down the flight line for aircraft maneuvering in shadows or at the very south end of the airport.

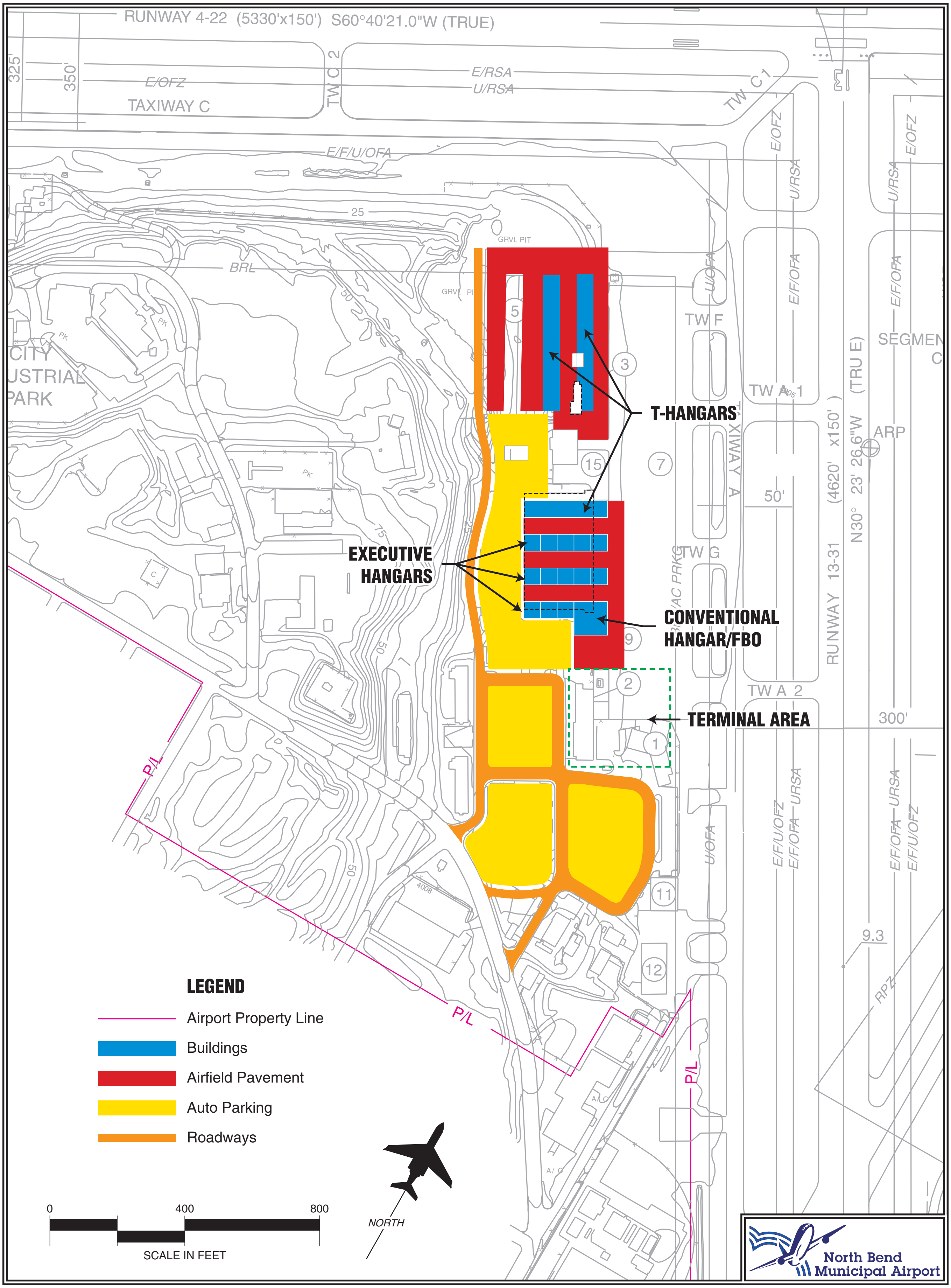


Exhibit 5D
LANDSIDE ALTERNATIVE A

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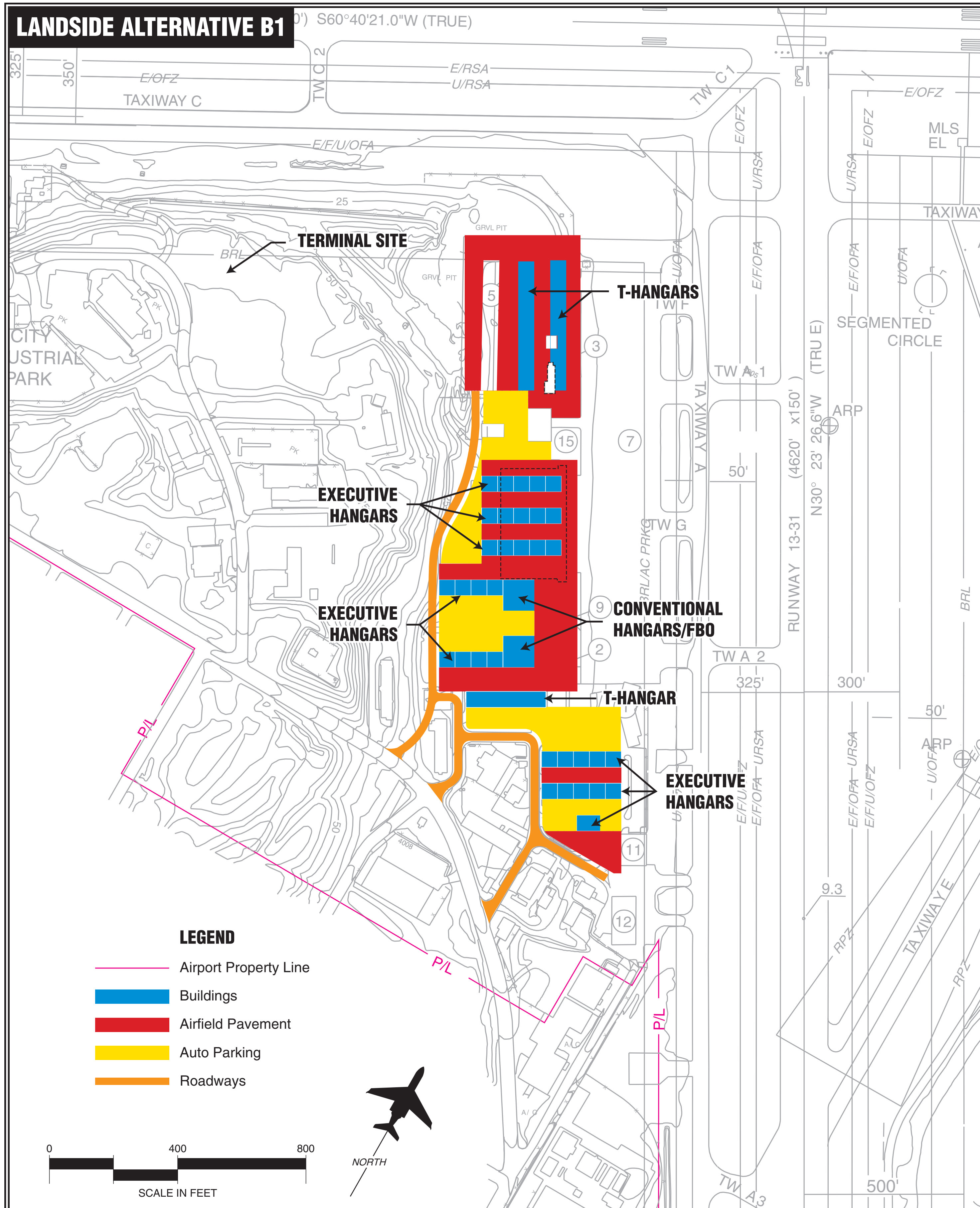

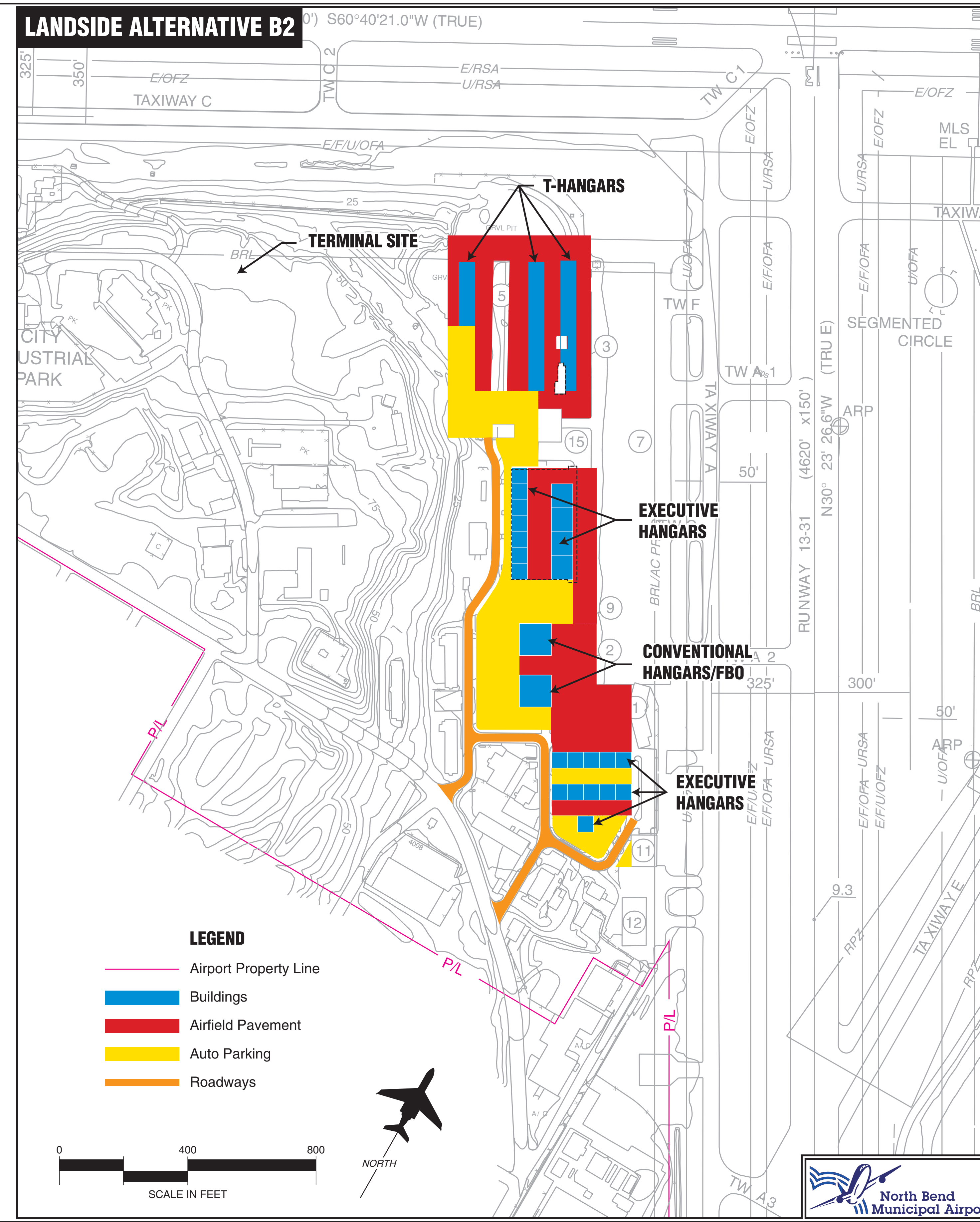

Exhibit 5E
LANDSIDE ALTERNATIVE B1/B2

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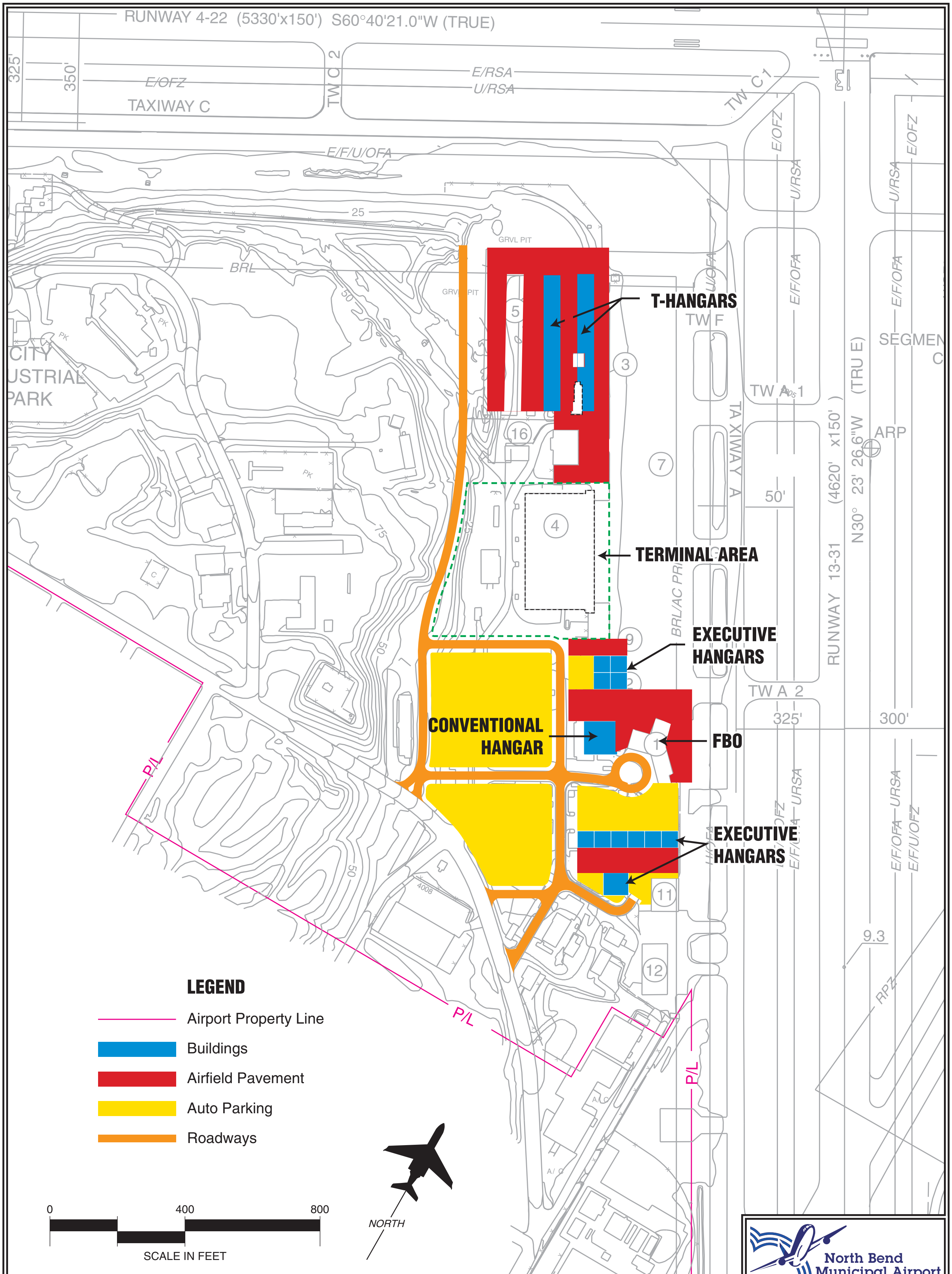

Exhibit 5F
LANDSIDE ALTERNATIVE C

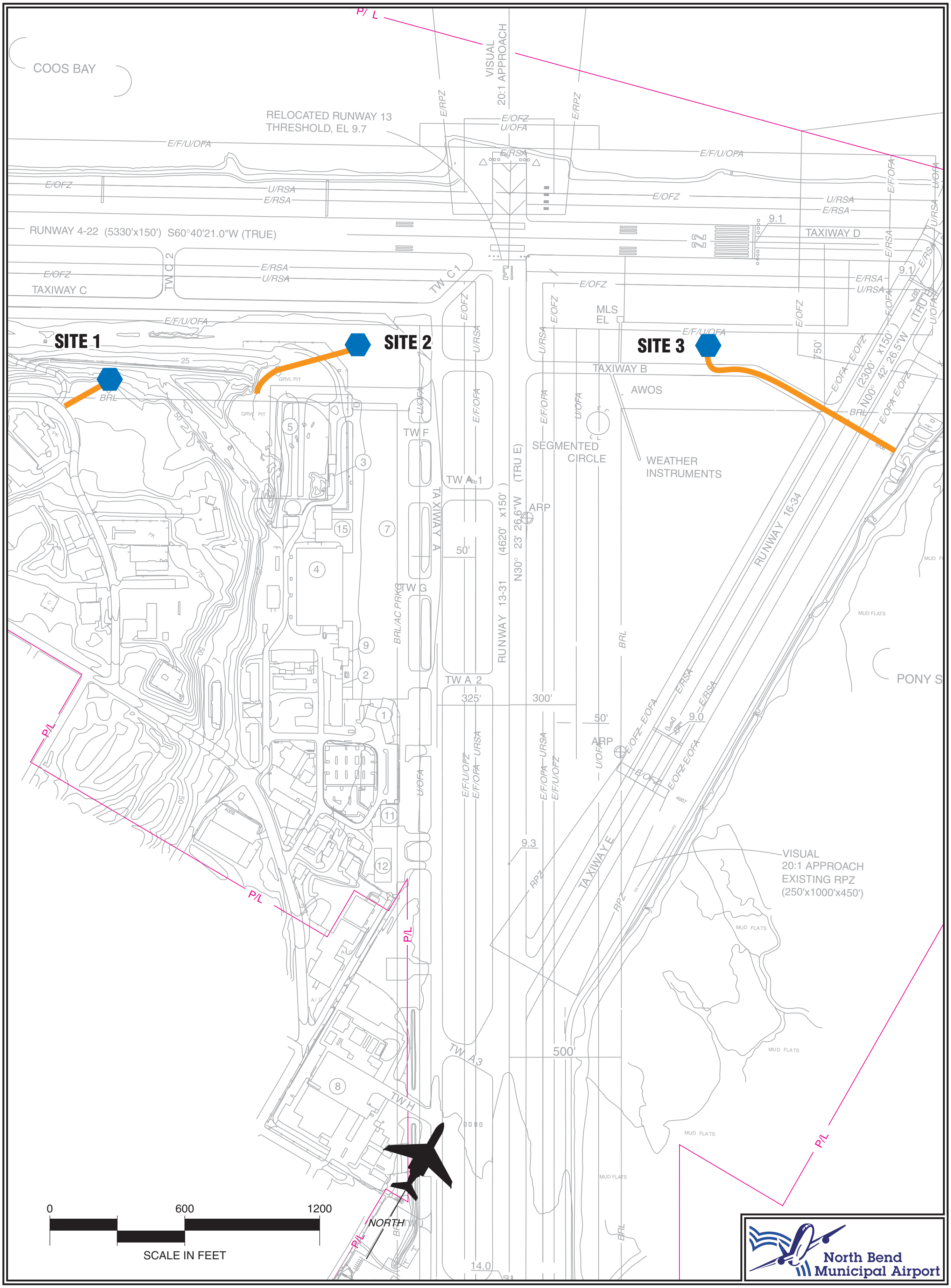

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Exhibit 5G
POSSIBLE AIRPORT TRAFFIC
CONTROL TOWER LOCATIONS

Site 3 locates the ATCT on the east side of the airport. Views are good into the ground areas and for incoming flights. Although shadows will always be a problem, the advantage of this site allows the controller full forward views.

This site would require ground access from the closed road along Pony Slough. An electronically activated gate device would most likely be required here.

All sites are proposed with the disclaimer that they have not been scientifically evaluated. A full ATCT Siting Study should be accomplished prior to selection of any alternative.

SUMMARY

As an essential element of the local and national transportation system, North Bend Municipal Airport has a specific role; and to satisfy this role, certain functions must be accommodated.

Typically, airports face development constraints of one degree or another because of their basic function, causing the alternatives analysis to focus upon specific layouts of landside facilities. North Bend Municipal Airport is no exception and should maximize existing property in an efficient manner, serving demand well beyond the 20-year planning period.

To provide a functional facility which meets all potential development needs, areas best suited for specific development should be identified. First, essential development elements to serve airfield, passenger airline, and general aviation needs must be considered. Then areas for other land uses can be considered, such as aircraft maintenance, cargo, and industrial/ commercial development.

The resultant plan will represent an airside facility that fulfills demands well beyond the 20-year planning period, and a landside complex that can be developed in phases to meet demands. As any good long-range plan, it should be flexible to unique opportunities which may be presented to the Oregon International Port of Coos Bay.

The remaining portions of the master plan will be directed towards refinement of the master planning concept, cost estimating, phasing of the development program, and analysis of the various means available to fund the program.

North Bend Municipal Airport

Chapter Six
TERMINAL DEVELOPMENT ALTERNATIVES

Terminal Development Alternatives

This chapter shows alternative ideas for the future of the overall airport, alternative terminal area site plans developed in this study, evaluation of the terminal alternatives, and determination of the preferred terminal area alternative

Each alternative terminal area site was sized and configured to accommodate the passenger terminal facility requirements, shown in the previous chapter, and a passenger terminal building concept including its phased expansion. Adequate area exists within the current airport boundaries to accommodate the terminal facilities necessary to support the future passenger demand at North Bend.

In a separate chapter the airfield alternatives and improvements are discussed. The preferred alternative terminal area plan from this chapter is explained and developed further in Chapter 8.

The primary alternatives for ongoing development are in two categories below:

1.) Alternative ideas for the future of the overall airport; and

2.) Alternative sites for the passenger terminal area.

OVERALL AIRPORT ALTERNATIVES

NO-BUILD ALTERNATIVE

The first option to consider is to do nothing, or a "No-Build" plan. A "No-

Build" development plan actually means no additional capacity improvements would be built for airside or landside facilities. Remodeling or reconfiguration of existing facilities can occur in a "No-Build" plan. The main reason to consider a "No-Build" option is to provide a baseline for comparison of alternatives with development. It is also useful to understand the possibility that passenger demand may not increase in the short-term.

In 2000 the Port Commission asked Richard Turi to analyze the existing terminal building and prepare options for reconfiguring/reconstructing the facility. Two options were presented which included shifting the enplaning and deplaning corridors, moving the baggage claim area to the south to improve circulation, move the airport operation area upstairs and reconfigure the ticket counters. The options also included a new façade to update the exterior image of the building. The "rough" cost estimate for this option was $750,000.00.

The result of a "No-Build' plan is that, as growth in activities occurs, airport facilities will become more congested with passengers and vehicles as the capacities of facilities are reached. Passengers would become increasingly dissatisfied and frustrated in the parking lots, roads and terminal of such an airport, and chose to travel by another mode, or not to travel. Businesses would avoid locating in the region served by this airport, and existing businesses would suffer. These are undesirable consequences. For this reason the "No-Build" option is not recommended for this airport.

RELOCATE PASSENGER SERVICE TO ANOTHER AIRPORT

Another option to consider is to transfer air carrier operations to another airport and not expand at North Bend Municipal Airport. No other convenient alternative airport exists near North Bend. The closest airport with air carrier service is in Eugene, a 130-mile drive from North Bend. This distance makes the relocation of air carrier service an undesirable option for passengers and the coastal communities. For communities south of North Bend, the drive time to Eugene increases. In addition, the local economy of southwestern Oregon depends on the air service provided at North Bend. For these reasons this option is not recommended for this airport.

BUILD A NEW AIRPORT

A third option is to start over at a new site. The creation of new airport is a complicated political process. It takes many years to find an appropriate site, accomplish approvals, and secure funding. The negative impacts on the region around new airports are severe.

Building a new airport is an option for airports with capacity constraints so severe that expansions and improvements at the existing site cost more than a total rebuilding of all facilities on a new site. North Bend Airport is not in that situation. Adequate area exists to make capacity improvements at the existing site for at least the next twenty years and presumably beyond. Therefore this option is not recommended.

DEVELOP THE EXISTING AIRPORT

The fourth option is to continue to use and add capacity to the existing airport. This is the most logical development option for the community. The next section discusses the potential locations for the terminal area continuing development of the existing airport.

TERMINAL ALTERNATIVES

No terminal area sites on the east side of Runway 13-31 were identified for this Master Plan. The previous Master Plan recommended a terminal site east of Runway 13-31. That side of the airport no longer has public access since the road to the boat ramp into Pony Slough was closed. Locating a terminal east of Runway 13-31 is not considered a feasible alternative because the cost to access the site will be large. The alignment would route the access road into Pony Slough on fill or pilings to support the roadway. That alignment is necessary to remain outside of the runway setbacks and the clear zone at the end of the runway. The high cost of road access to that side of the airport is not desirable when other alternatives exist.

Three alternative locations for the future terminal area have been identified west of Runway 13-31. Any of the sites will accommodate the growth for the 20-year planning period. Refer to **Exhibit 6A** for a key plan of these locations. These sites lie inside the current airport property boundaries. All alternatives developed in this chapter provide the terminal area facility requirements shown in Table 5A. The three sites identified for terminal development are labeled:

1.) Terminal Area Alternative 1 at the Existing Terminal;

2.) Terminal Area Alternative 2 at the Existing Hangar;

3.) Terminal Area Alternative 3 on the Plateau.

COMMON FEATURES TO ALL ALTERNATIVES

All of the alternatives shown in this chapter develop the terminal area on the west side of Runway 13-31 within the existing airport boundaries. Each of these sites is expected to have four aircraft parking positions ultimately on the airside of the future terminal. A one-way road that loops around the ultimate public vehicle parking area is planned on the landside of the terminal. A goal of the landside planning is to have all vehicles park on grade and no further than a 300-foot walk to the terminal curb. Three hundred feet walking distance is considered the industry standard maximum distance to carry baggage.

Another landside goal is to restrict the terminal access road to only terminal users such as passengers, greeters, well-wishers, airport terminal staff and tenants' staff. This means the terminal should have a dedicated road that does not serve other facilities. The main reason for this feature is to reduce the number of vehicles crossing in front of the terminal and conflicting with pedestrians crossing at the terminal curb. All of the alternatives include this circulation plan.

TERMINAL AREA ALTERNATIVE 1

The first site to consider for the future terminal area is the existing terminal area. Refer to **Exhibit 6B** for this alternative. One advantage of this concept is the continued use of portions of the existing utilities and infrastructure of the existing terminal. However, sharing the terminal and the existing services during construction of a new terminal also complicates construction of a new terminal.

In the short-term, expand the existing terminal may be desirable. Adequate area exists adjacent to the terminal to expand it. The aircraft apron is constrained however. The main constraint to expansion of the existing terminal is the limited number of aircraft that can park on the airside of the terminal. By the end of the planning period, four aircraft parking positions are planned. Just east of the terminal is the building restriction limit. The terminal and the apron can not be expanded significantly to the east. The apron can not be expanded to the west without relocation of the existing ARFF. Additional aircraft parking positions in that direction will compromise the ARFF operations. Expansion of the apron to the north will also conflict with ARFF operations.

The best orientation for a new terminal at this site is parallel to Runway 13-31. With this alignment, linear zones can be created for aircraft parking and the terminal to continue to expand to either the north or the south, providing greater future planning flexibility.

The proposed terminal site places the aircraft parking positions against the building restriction line (BRL). This line is 500 feet from Runway 13-31 and is also as close as aircraft can park to the runway. Siting the new terminal in the existing parking lot allows for an aircraft apron between terminal and the runway. Existing buildings west and south of the existing terminal would be removed to allow construction of the surface public vehicle parking lot and access roads as part of the initial construction phases of this alternative.

The main disadvantage of this alternative is the constraint on the landside caused by closeness of Maple Street Extension to the terminal site. This limits the vehicle parking area when it is expanded to the south.

A variation of this alternative is to build the new terminal on the site of the existing ARFF. The main advantage of that site is the new terminal would use the existing aircraft parking apron in the short term. Additionally, the traveling public could continue to use the existing terminal with less disruption during construction of the new terminal because the two locations are more separate.

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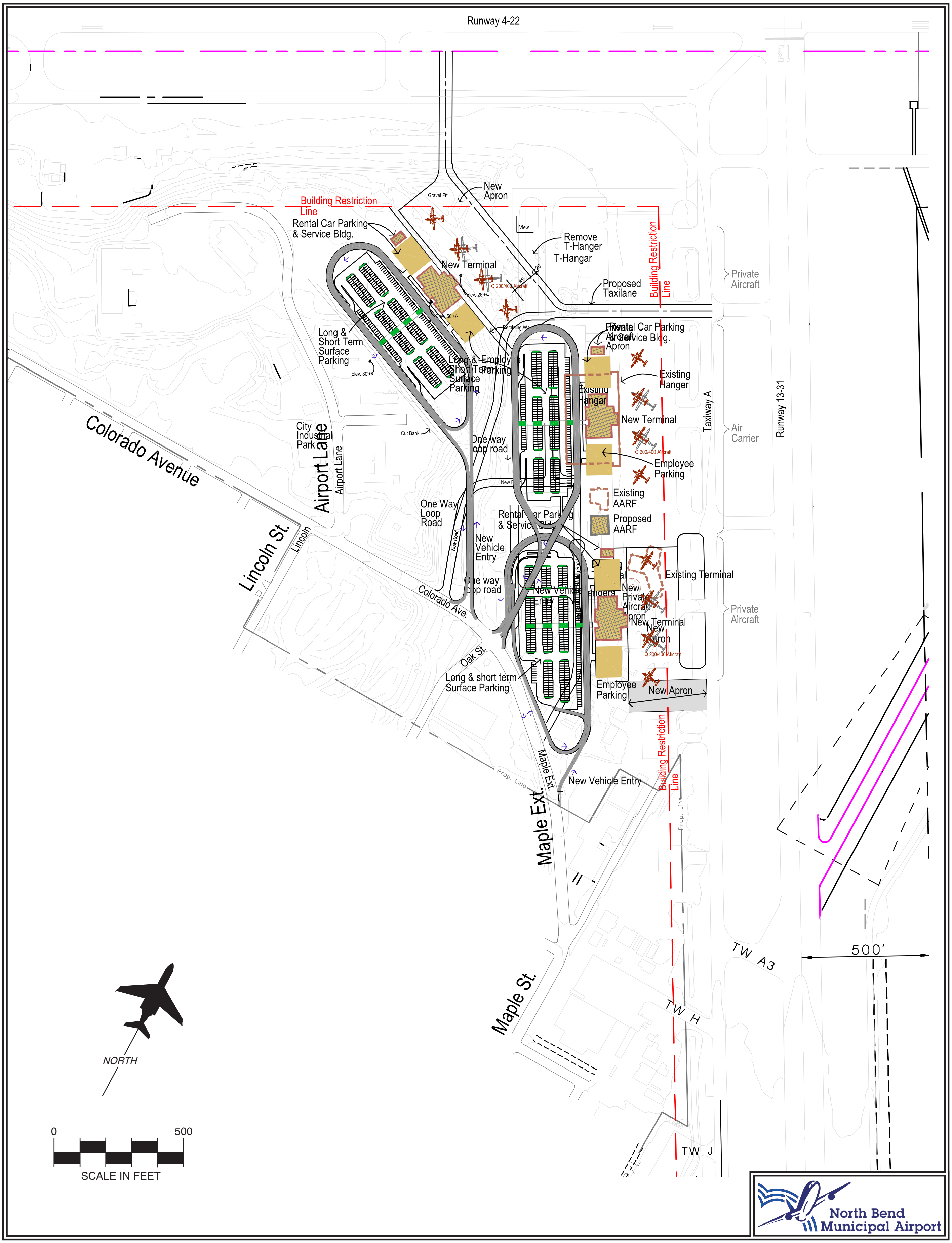

Exhibit 6A
TERMINAL AREA
ALTERNATIVE LOCATIONS

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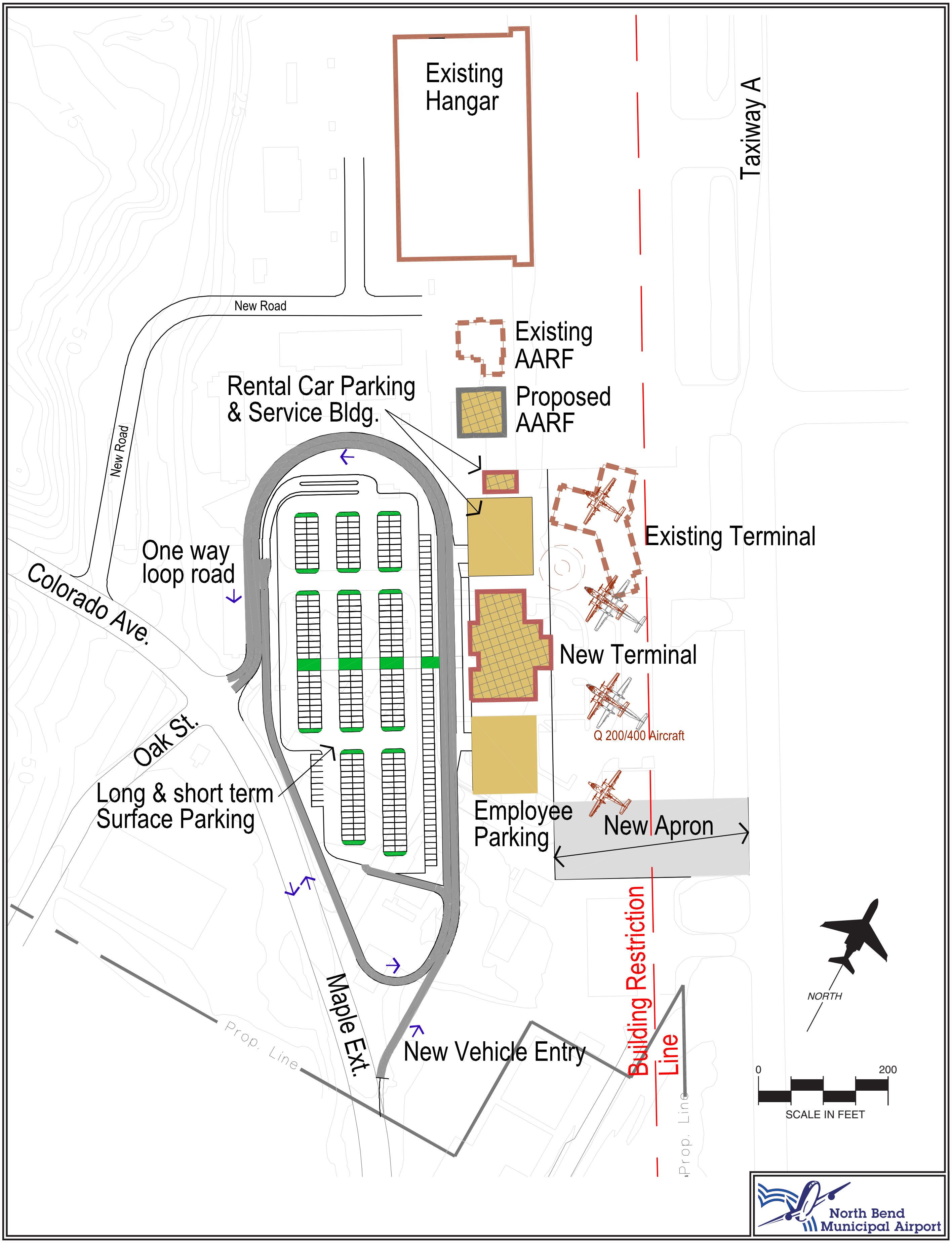

Exhibit 6B
TERMINAL AREA ALTERNATIVE 1
AT THE EXISTING TERMINAL

TERMINAL AREA ALTERNATIVE 2

Further north of the existing terminal area is the second alternative, generally located at the site of an existing hangar. Refer to **Exhibit 6C** for this alternative. A terminal developed at this site could either incorporate the existing hangar as the "roof" of the terminal or the hangar could be demolished and a new terminal built on the site. The existing hangar area is approximate 70,000 square feet under the roof. This area is larger than the programmed terminal area of 16,500 square feet. The cost of upgrading the hangar to current building codes may be prohibitive.

This site is constrained in the east-west direction because the terrain slopes on the west side. The typography limits the landside potential of this site. Two hundred and twenty-five feet west of the existing hangar, the existing grade rises significantly. This is not an adequate dimension for the landside area of a terminal. For these reasons, using the existing hangar for the new terminal building is not recommended.

An additional 75 feet can be added to the landside if the hangar is demolished. Three hundred feet is adequate for landside development. This alternative is depicted on **Exhibit 6C**.

This concept dislocates the private aircraft parking from the hangar site. Creating an aircraft apron at the existing terminal site is a likely location for replacement of the private aircraft parked in the hangar. This concept places commercial operations between private aircraft operations north and south of the hangar site. This may complicate future security operations when 50-seat aircraft operate at North Bend.

TERMINAL AREA ALTERNATIVE 3

The third alternative lies on the higher elevation of the plateau overlooking Coos Bay and south of Runway 4-22 and west of Runway 13-31. Refer to **Exhibit 6D** for this plan. This site is mostly undeveloped but shares the high ground with other building tenants in the City Industrial Park. This site will have a view of the bay and airfield in the foreground.

The challenge of this site is its slope and the large quantity of soil excavation needed to create the building pad and the aircraft apron. The BRL is 750 feet from the runway centerline at this site, parallel to Runway 4-22. Aircraft parking positions must lie beyond this line. This means excavating a significant quantity of soil for the aircraft apron and building pad. Placing the aircraft and the terminal on a diagonal between the two runways will limit the excavation because excavation of a gravel pit has already occurred.

The aircraft apron could be located chiefly on that zone if the remaining soil is stable and has adequate bearing capacity.

Many terminals have gate lobbies on a floor level above the aircraft apron. The industry standard is for the second floor to be 14 feet above the apron grade. That height accommodates jetways or passenger loading bridges extending from the gate lobby to the sill of the aircraft door. Jetways are unlikely at North Bend because the size of aircraft that will operate have low door sills that do not mate with jetways.

For passenger convenience, elevators and potentially escalators will be necessary for this alternative to assist in the approximate 25 feet of vertical grade change that occurs from the apron to the terminal roadway curb. Elevators are necessary to make a terminal handicap accessible, as the length of walking ramps would be prohibitive. A retaining wall will support the soil cut southwest of the aircraft apron. Sloping conveyors will also be needed to move baggage across the slope in the terminal building. The existing grade continues to rise south of the parking lot to elevations near +80 feet.

All these systems can be added to a terminal building. They increase the capital and operational costs of this alternative compared to Alternatives 1 and 2.

TERMINAL BUILDING CONCEPT PLAN

In order to perform a proper analysis of alternative terminal area sites, and evaluate them thoroughly, a concept plan for a future passenger terminal building was developed. **Exhibit 6E** shows a possible configuration of a single-level passenger terminal concept, in the size defined in the requirements program, described in the previous chapter. Other possible configurations can be developed, evaluated and determined in the future when it is time to design the terminal in detail. An overall terminal building footprint of approximately 120 by 170 feet should be reserved for the site of a new terminal, not including site elements such as roadways, parking, curbside, and aprons. This is the building size required for the fully developed future phases of the planning period identified in the previous chapter.

The plan is configured to be flexible for future changes. The initial construction begins with only the size of building necessary for the first phase, which is smaller than the plan shows. The terminal concept allows for terminal functions to expand incrementally from the first phase as passenger demand warrants. Moreover, additional structural building bays can be added at the sides of the plan for expansion beyond the planning period.

ARFF

The existing ARFF (Airport Rescue and Fire Fighting) building was built about 60 years ago. Modern-size firefighting vehicles are larger than the vehicle bays provided in the building and have difficulty parking in the existing build. Either a new building needs to be built or the existing facility needs remodeling. Replacement of the building is shown in the alternatives prepared for this chapter. However, it is not necessarily that a new ARFF be built on the same site.

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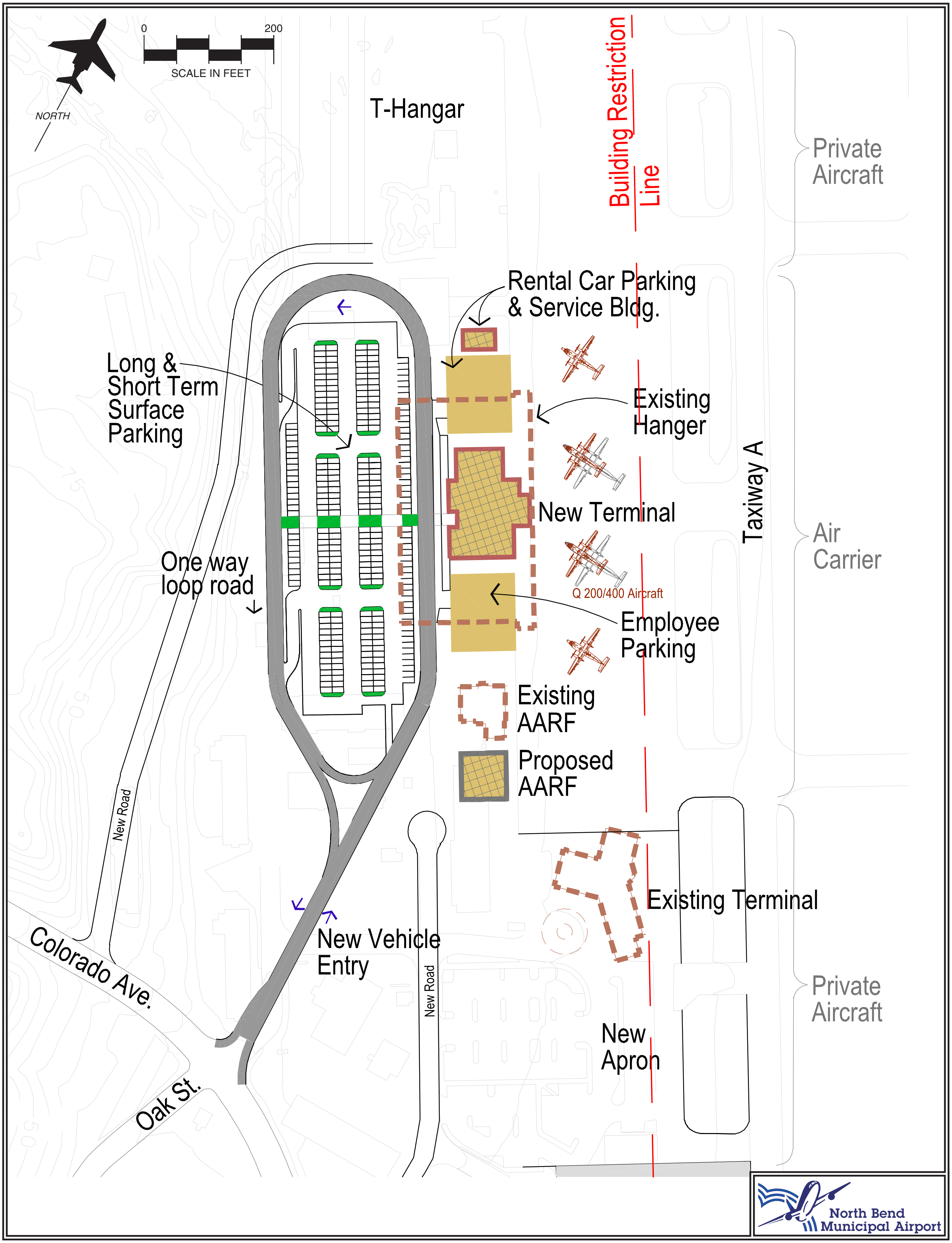

Exhibit 6C
TERMINAL AREA ALTERNATIVE 2
AT THE EXISTING HANGAR

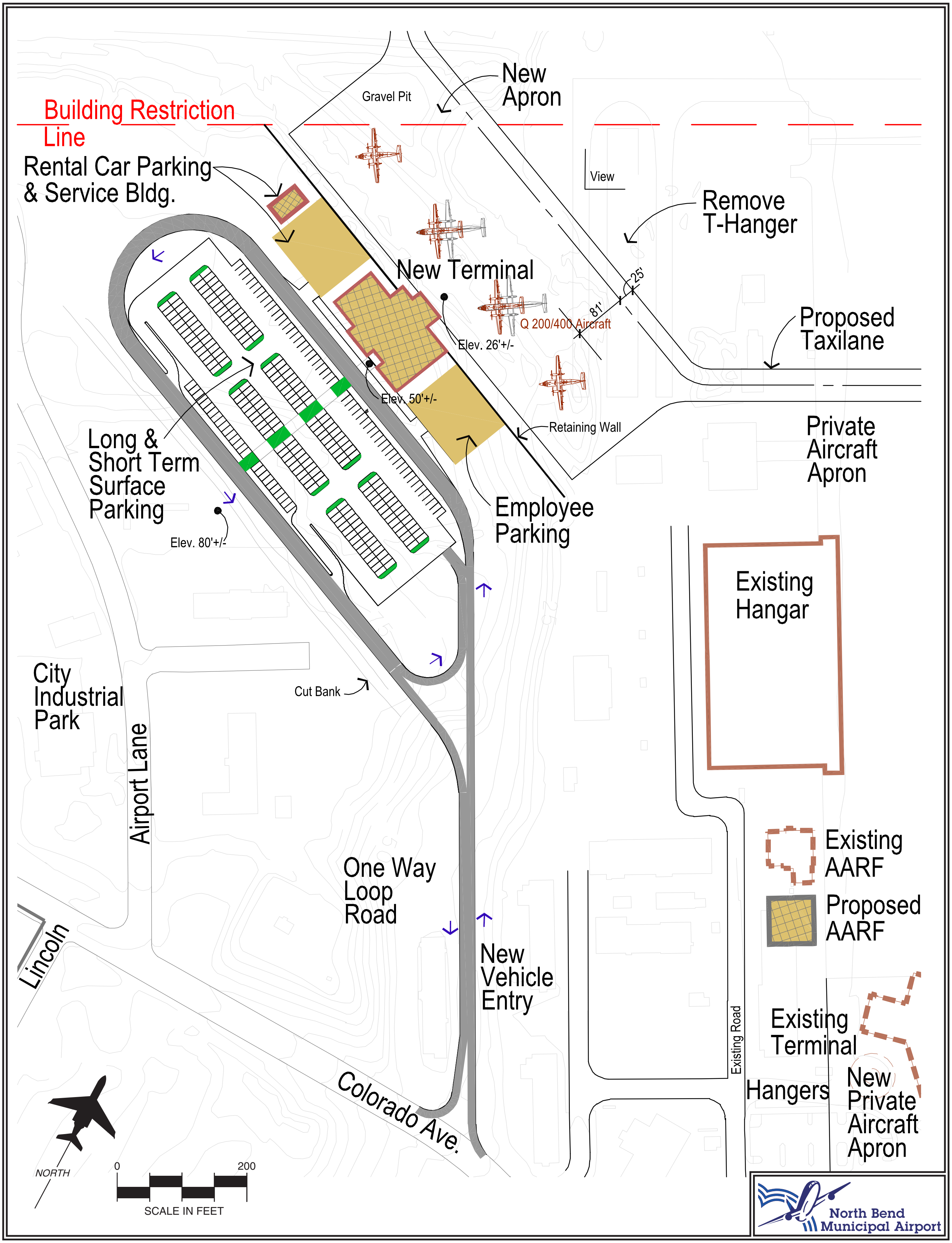

Exhibit 6D
TERMINAL AREA ALTERNATIVE 3
AT THE PLATEAU

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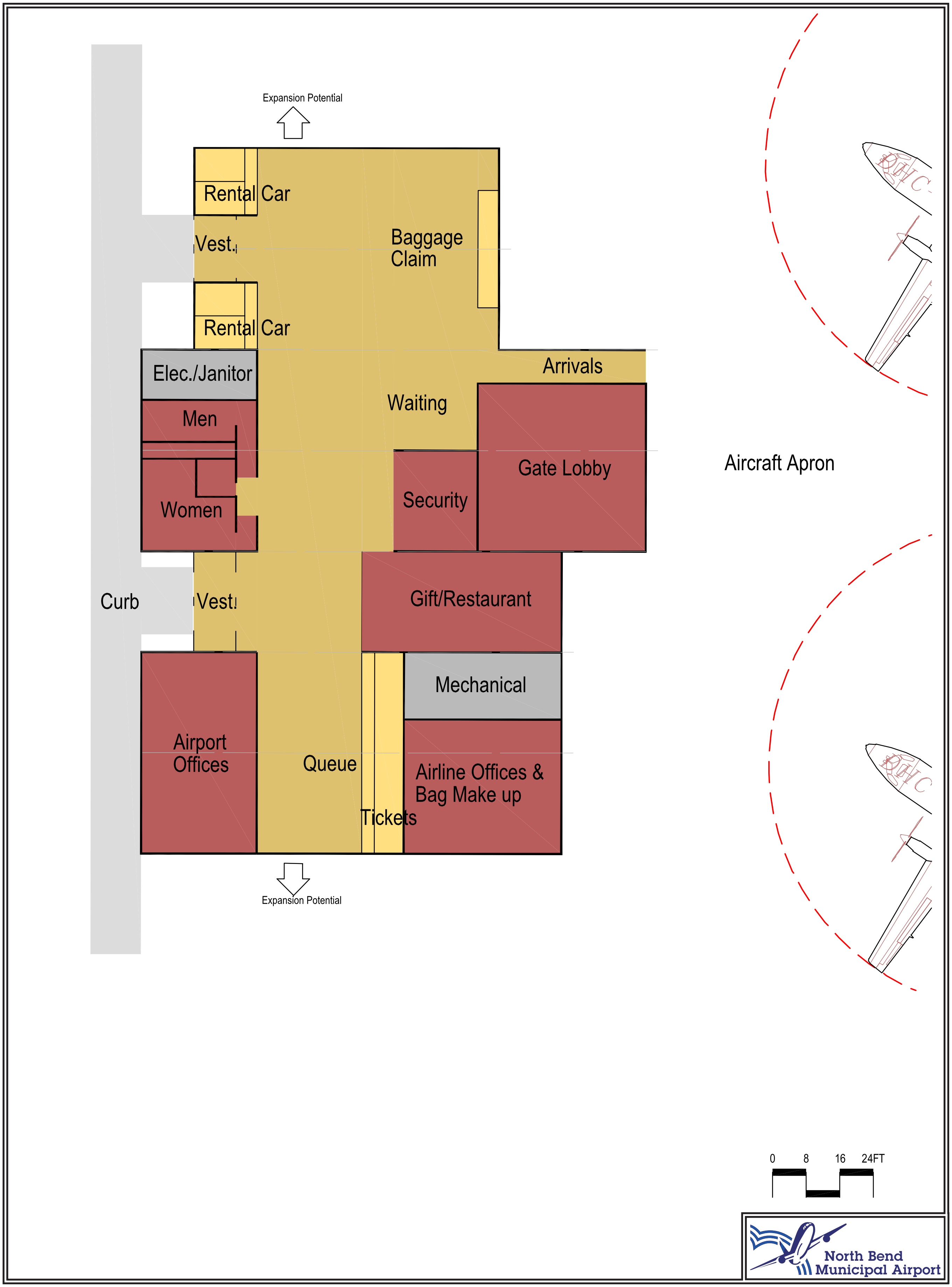

Exhibit 6E
TERMINAL CONCEPT PLAN

UTILITY ANALYSIS

In reviewing the alternatives for the future North Bend Municipal Airport terminal area site, the utilities are an important consideration. The future terminal location must have water, storm sewer, sanitary sewer, power and telephone service. Natural gas and fiber optics services, though not required, would also be advantageous for the future terminal.

The first step in evaluating the utilities is determining what capacity is needed for the future airport terminal. This requires sizing of the water and sanitary sewer services. First, the number of employees and passengers currently using the airport terminal was determined using enplanements and deplanements and known employee numbers. These numbers were then used to forecast for 2020.

To forecast for 2020, current employee and passenger numbers were multiplied by a percentage increase. This percentage increase was derived from the percentage increase in terminal area as defined in Table 5A, Terminal Building Facility Requirements, in the Facility Requirements chapter of this master plan. The ratio of the area needed for the terminal in 2020 and the current theoretical area (theoretical area is based on current passenger demand, thus providing a reasonable reference datum when using current passenger and employee numbers) results in a percentage for growth of employees and passengers in the next twenty years. The ratio is not determined directly from the total terminal area, but is applied to each type of person depending on the area they use. For instance, the future passengers are determined by multiplying the ratio of the future to existing departure gate lobby and arrivals, and the future number of car rental employees are determined by multiplying the ratio of future and existing areas for the car rental area, and so on.

Once the future number of passengers and employees is determined, those numbers are used to calculate a number of gallons per day that the water and sanitary sewer systems will need to accommodate. This is done by multiplying the number of passengers and employees by a typical water flow and sewer flow rate for airports and commercial facilities. This number for passengers is 3 gal/day of water and 3 gal/day of sewer. For employees, 15 gal/day of water and 13 gal/day of sewer were used. The typical flow rates were obtained from Metcalf & Eddy, Wastewater Engineering, Third Edition. These rates were then converted to the correct relative length of day, an average of 8 hours for employees and 12 hours for passengers and multiplied by a peaking factor to get the flow rate for which the water and sewer lines need to be sized. This flow rate corresponds to approximately a 2-inch pipe for both sewer and water. Therefore, a standard minimum of 6-inch pipe for water and 8-inch for sanitary sewer will be used for the proposed terminal site evaluation.

Fire flow must also be accounted for when looking at the water main capacity around the proposed terminal site. A future building size of 16,500 s.f.

was used and it is assumed that the future terminal building will have automatic sprinklers. Using the requirements from the 1997 Uniform Fire Code, Appendix III-A, the required fire flow for the building is 1500 gal./min.

TERMINAL ALTERNATIVE 1 – EXISTING TERMINAL SITE

Storm Sewer

Since the majority of the area around the existing airport terminal is impervious, it is assumed that any expansion or reconstruction of the airport terminal will not create any additional impervious area. Therefore, the existing storm drainage system around the terminal is sufficient for the future development, though minor adjustments may be needed. The existing storm drainage system consists of an 8-inch and a 10-inch pipe tying into a 15-inch pipe adjacent to the existing terminal building, which then flows to the system on the airfield.

Sanitary Sewer

There is an existing 8-inch sanitary sewer line along East Airport Way, west of the existing terminal building. This line will meet the standards recommended minimum of an 8-inch sewer for facilities serving more than 30 people; therefore service can be obtained from this sanitary sewer line.

Water

As previously mentioned, 6-inches is the standard minimum water line diameter. The service to the terminal itself may be smaller, and can be determined during the design process for the terminal. There is currently an 8-inch waterline along East Airport Way, just west of the existing terminal building, from which the future terminal can be served. This waterline has been tested by the Coos Bay/North Bend Water Board. It yielded approximately 5,000 gal./min. of flow at 20 psi. This is more than sufficient to meet the future terminal fire flow needs of around 1,500 gal./min.

Telephone

The existing terminal site has phone service, so no extension of telephone service will be necessary for this alternative, though minor modifications would be needed for the new terminal.

Power

The existing terminal site has power, and it is assumed this will be sufficient to serve the future terminal.

TERMINAL ALTERNATIVE 2 – EXISTING HANGAR SITE

Storm Sewer

This site consists entirely of impervious surfaces that are currently served by the storm drainage system. Since no additional impervious surfaces will be added with construction of a terminal, it is assumed that the existing storm drainage at this site can accommodate future development with only minor modifications. The existing storm drainage system available to serve this area consists of a 6-inch storm pipe to the south of the existing hangar and 12-inch storm pipes to the east (on the apron) and to the north of the existing hangar.

Sanitary Sewer

As noted in the earlier, an 8-inch diameter sanitary sewer pipe is needed to serve the future terminal building. The sanitary sewer currently serving this site is only 6-inches in diameter, but there is an 8-inch main just to the south of this site (which then flows west to an 18-inch and 24-inch main). To serve the future terminal, the sanitary sewer pipe will need to be increased to 8-inches from the new terminal building to the existing 8-inch main.

Water

There is currently an 8-inch water line up to the existing hangar and 12-inch waterlines to the north and south of the existing hangar. All waterlines are capable of serving the future terminal, with only minor improvements in order to provide a service line to the future terminal building. The waterlines in this area have been tested by the Coos Bay/North Bend Water Board. They yielded approximately 5,000 gal./min. of flow at 20 psi. This is more than sufficient to meet the future terminal fire flow needs of around 1,500 gal./min.

Telephone

There is telephone service to the existing hangar site, which can be used for future terminal development.

Power

Though no map for power locations was available, it is assumed that there is power to the existing hangar site, which can support terminal development.

TERMINAL ALTERNATIVE 3 – PLATEAU SITE

Storm Sewer

There is an existing 18-inch storm drain line on the north of this site and a 24-inch line to the east. Storm drainage for the future terminal can be tied into this existing system. The development of this site will likely add a significant amount of impervious surface; therefore a detention system will be necessary to maintain the current flow rates off of the site. Through the use of a detention system to maintain existing flows, the flows into the existing systems should not increase and therefore their size will not need to be increased.

Sanitary Sewer

There are several sewer lines in the area of this site, an 8-inch, an 18-inch and a 24-inch line. Sewer service can be brought from any of these lines.

Water

There is an existing 12-inch water line along Airport Lane, adjacent to this future terminal site, which is larger than necessary to meet the future terminal requirements of a 6-inch water line. This is the closest location to the site, but is at a higher elevation than the airfield. As a result of the elevation difference, the Water Board would prefer to extend the 12-inch water main from the existing hangar (terminal alternative #2) to the site. If this site is chosen, the future water service will have to be reviewed to determine the preferable option. Adequate fire flow should be available. Based on information from the Coos Bay/North Bend Water Board, the flow near the existing hangar is around 5,000 gal/min, and the flow on Airport Lane is in the range of 2,000 gal./min., both which meet the future terminal fire flow needs of 1,500 gal./min.

Telephone

There is telephone service to the existing hangars to the east of the site, and a service that runs along Airport Lane to the west. Service could likely be obtained from a branch off of one of these locations, but would involve some new installation work to reach the site. The airport would be responsible for providing the conduit to the building, and then Verizon would supply the service and terminals.

Power

Though a map of power service was unavailable, power should be able to be brought from the hangar area east of the site or from Airport Lane.

Fiber Optics

Verizon, the local telephone service provider, has installed a fiber optic line to a business on Colorado Avenue, just across the street from the airport. Associated with this line is a fiber optic node, from which fiber optic service, up to the level of a DS3 line, can be provided to the airport. This is the nearest location to the airport from which fiber optic service can be provided. Fiber optics for any of the four alternative terminal locations would come from the existing node on Colorado Avenue.

Natural Gas

There is currently no gas service to the North Bend Municipal Airport or the surrounding area. Northwest Natural Gas is in the environmental stage of a design and construction project to bring gas service to the City of North Bend (which includes bringing gas service down the I-5 corridor from Roseburg). They are hoping to begin construction in 2002. Part of this construction plan includes bringing gas service, as needed, to the airport. Once a future terminal location is chosen, gas service should be coordinated with Northwest Natural Gas so they can provide the appropriate service as part of their current construction.

EVALUATION OF THE TERMINAL ALTERNATIVES

A matrix evaluation of the alternatives is shown on **Exhibit 6F**. Various categories are listed and a numerical value was assigned to each category. The alternative with the highest total score achieves the most benefits.

The matrix compares the relative benefits of between the alternatives by assigning a numerical score for each feature category. These types of evaluations are a judgment placed on the alternatives with only a conceptual knowledge of details inherent in the concept. Specifically, construction costs can vary considerably among alternatives and between the actual construction bid to build the selected concept from its cost estimates. For example, soil conditions were not evaluated in the matrix but can have a signification impact on the project construction cost.

Based upon the total score in the evaluation, the “features” of Alternative 1 are superior to the other alternatives. Alternative 2 has more benefits than Alternative 3.

PREFERRED TERMINAL AREA ALTERNATIVE

The alternative concepts were thoroughly analyzed and presented to the airport for discussions in an ongoing evaluation process. In this process the alternatives were evaluated against a series of criteria, including comparative costs (refer to Appendix C for terminal alternatives construction costs). Out of this process the preferred alternative was determined: Terminal Area Alternative 2 at the existing hangar site. This recommended Terminal Area Plan is presented in Chapter 8.

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Evaluation Matrix

Terminal Area Site Alternatives	Alternative 1 at Existing Terminal	Alternative 2 at Existing Hangar	Alternative 3 on Plateau
		Higher number is better	
Meets Program Area	10	10	10
Expansion Beyond 2020	2	1	0
Construction Costs *single level floor plan no elevators/escalators/retaining walls*	6	4	0
Environmental			
Disposal of less excavation	1	1	0
Traffic	0	0	0
Noise	0	0	0
Emissions	0	0	0
Incompatible land uses	0	0	0
Infrastructure			
Cost of roads & utilities	2	1	0
Function & Operations			
Aircraft taxi times	0	0	1
Lower airport operational cost	1	1	0
Separation of commercial and private ops	1	0	1
Short walking distances car to plane	1	1	0
Development Benefits			
Removes undesirable buildings	1	0	0
Fewer lease holder relocations	0	0	1
Construction Phasing			
Fewer passenger inconveniences	0	1	2
Community			
Views	0	0	1
Tsunami survival	0	0	1
Totals	25	20 *Higher total is better*	17
Ranking	1	2	3

North Bend Municipal Airport   Terminal Area Plan

North Bend Municipal Airport

Chapter Seven
FINANCIAL PLAN

Financial Plan

The analyses conducted in the previous chapter evaluated airport development needs based upon forecast activity changes and operational efficiency. However, the most important element of the master planning process is the application of basic economic, financial, and management rationale to each development item so that the feasibility of implementation can be assured. The purpose of this chapter is to provide financial management information and tools which will make the master planning recommendations achievable.

The presentation of the financial plan and its feasibility has been organized into three sections. First, the airport development schedule is presented in narrative and graphic form. Secondly, airport improvement funding sources on the federal, state, and local levels are identified and discussed. Finally, the airport's operating fund is examined for its ability to support future capital improvements.

AIRPORT DEVELOPMENT SCHEDULE AND COST SUMMARIES

Once the specific needs and improvements for the airport have been established, the next step is to determine a realistic schedule and the costs for implementing the plan. This section examines the overall cost of development and presents a development schedule. The recommended improvements are grouped into three planning horizons: short, intermediate, and long-term. **Table 7A** summarizes the key activity milestones for each planning horizon.

TABLE 7A
Planning Horizons
North Bend Municipal Airport

		Planning Horizons		
	Base Year	**Short Term**	**Intermediate Term**	**Long Term**
ANNUAL OPERATIONS				
Itinerant Operations				
Air Carrier	2,920	3,600	4,200	6,000
Air Cargo	2,434	3,400	4,200	5,800
Air Taxi	300	300	300	300
Military	3,342	3,500	3,500	3,500
General Aviation	20,113	23,500	25,100	28,500
Total Itinerant	29,109	34,300	37,300	44,100
Local Operations				
General Aviation	9,907	11,500	12,400	14,000
Total Operations	**39,016**	**45,800**	**49,700**	**58,100**
ENPLANEMENTS	29,034	35,000	45,000	70,000
BASED AIRCRAFT	67	70	75	85

The short-term planning horizon covers items of highest priority. These items are coordinated on a yearly basis with the Federal Aviation Administration (FAA), as they update short-term capital program information and assign potential funding sources and priorities to individual projects. Each year, the airport will need to re-examine the priorities for funding in the short-term period, bringing projects which were originally included in intermediate or long-term planning horizons, onto the FAA's capital programming list. While some projects will be demand-based, others will be dictated by design standards, safety, or rehabilitation needs. In putting together a listing of projects, an attempt has been made to include anticipated rehabilitation needs through the planning period and capital replacement needs. However, it is difficult to project with certainty the scope of such projects when looking 20 years into the future. The airport development schedule has been presented as **Exhibit A1, Proposed Capital Improvement Projects** of **Appendix A** following this chapter. An estimate has been included with each project of federal funding eligibility, although this amount is not guaranteed. For larger capital projects, it may be necessary for the Port to apply for federal discretionary funds (discussed in more detail in the following paragraphs).The terminal program is more specifically delineated in **Exhibit A2, Terminal Site Costs** of **Appendix A**. **Appendix B** regards building demolitions, including: **Exhibit B1, Building Demolition**

Costs; **Exhibit B2, Revenue Loss**; and **Exhibit B3, Site Map**. The staging of the major airside and landside projects within the development program is graphically presented on **Exhibit 7A**.

Due to the conceptual nature of a master plan, capital projects should undergo further refinement prior to requesting funds from the FAA. Capital costs presented in **Exhibits A1** and **A2** of **Appendix A,** are in current (2001) dollars. Adjustments will need to be applied over time as construction costs or capital equipment costs change.

AIRPORT DEVELOPMENT AND FUNDING SOURCES

Financing capital improvements at the airport will not rely exclusively upon the financial resources of the Oregon International Port of Coos Bay. Capital improvements funding is available through various grants-in-aid programs on the state and federal levels and local passenger facility charges. The following discussion outlines the key sources for capital improvement funding.

FEDERAL AID TO AIRPORTS

The United States Congress has long recognized the need to develop and maintain a system of aviation facilities across the nation for national defense and promotion of interstate commerce. Various grants-in-aid programs to public airports have been established over the years for this purpose. The most recent legislation was enacted in early 2000, and is entitled the *Wendell H. Ford Aviation Investment and Reform Act for the 21st Century* or AIR-21.

This four-year bill covers fiscal years 2000-2003. This was breakthrough legislation because it authorized funding levels significantly higher than ever before. Airport Improvement Program (AIP) funding was authorized at $2.475 billion in FY2000, $3.2 billion in FY2001, $3.3 billion in FY2002, and $3.4 billion in FY2003. AIR-21 also provides a wider range of funding opportunities for smaller communities. Among new opportunities, applicable to North Bend Municipal Airport, are a contract control tower cost-sharing program and a program to help small, underserved airports market and promote air service.

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 development, facilities and equipment, and research and development). The Trust Fund also finances the operation of the FAA. It is funded by user fees, taxes on airline tickets, aviation fuel, and various aircraft parts.

Under the AIP, on airports such as North Bend, eligible projects (such as property acquisition, airfield, apron, and terminal improvements) receive 90 percent federal participation. Funds are distributed each year by the FAA under authorization from Congress. A portion of the annual distribution is to primary commercial service airports (defined as airports with greater than

10,000 annual enplanements), based upon enplanement levels. Through AIR-21 each commercial service airport receives a minimum of $1,000,000 per year in entitlements (if AIP is funded at the fully authorized amount). Lower levels could occur based on appropriations. Additional amounts are received, determined by the number of enplanements per year. However, AIR-21 is only funded through 2003 and the future funding levels will be appropriated per discretion of Congress.

With 29,032 enplanements in 2000, North Bend Municipal Airport will receive the minimum amount of $1,000,000 in entitlements for FY 2002. The airport is not expected to exceed the minimum entitlement level through the planning period. Discretionary funds are distributed by the FAA based on the priority of the requested project.

Eligible projects for discretionary funding include: pavement rehabilitation; property acquisition; airfield improvements; aprons; safety items (such as aircraft rescue and fire fighting (ARFF) facilities, securing safety areas, and security fencing); and access road improvements. Priorities are assigned for each type of project contemplated by the airport. ARFF, safety areas, obstruction removal, Part 107 (security), and pavement rehabilitation receive higher priority than land acquisition, new taxiways, roads, and terminal buildings. Chapter 6 of FAA *Order 5100.38A, Change 2* discusses AIP funding eligibility of terminal projects. Generally, eligible items include areas defined by public use and (new to AIR-21) areas that are directly attributable to the movement of passengers and baggage in air commerce. Much of the terminal costs proposed for North Bend Municipal Airport CIP are AIP eligible. The parking lot improvements are included for funding, based on a non-revenue producing status.

Under FAA *Order 5100.38A, Change 2,* allowance is made for expanded terminal and parking lot eligibility. Section 47110(d)(2) "allows costs of terminal development in revenue-producing areas and construction, reconstruction, repair, and improvement of non-revenue-producing parking lots in revenue producing areas, and construction, reconstruction, repair, and improvement of non-revenue-producing public parking lots at commercial service airports that annually enplane 0.05 percent or less of the total U.S. enplanements" (including nonhub primary airports, such as North Bend Municipal Airport).

PASSENGER FACILITY CHARGES

Passenger facility charges (PFCs) were authorized by Congress through the Aviation Safety and Capacity Act of 1990. Authorized agencies are allowed to impose a charge of as much as $4.50 for each enplaned passenger. (The level was increased from $3.00 to $4.50 under AIR-21).

PFCs are collected for North Bend Municipal Airport, but can only be used on approved projects. However, they can be used to fund all of a project, or to match other AIP funds. The PFCs calculated for each year of the planning periods (and shown within the **Capital Improvement Funding** portion of **Tables 7C** through **7F**) are based upon

Exhibit 7A
DEVELOPMENT STAGING

receipt of 85 percent of potential receipts (to account for non-revenue passengers and airline collection fees) and increased at a modest 1.5 percent annual rate over the future planning periods. The PFC amount for 2001-02 ($111,300) was based upon CY2000 enplanements (29,032) x ($4.50 per enplanement) x (.85 or 85 percent).

While PFC funding does not provide a sufficient level to fund any major projects, the ability to use the funds to match other AIP grants is very important.

FAA FACILITIES AND EQUIPMENT 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 navigational aids and equipment of the national airspace system. Under the F&E program, funding is provided for FAA airport traffic control towers, enroute navigational aids, on-airport navigational aids, and approach lighting systems. Several items in the capital improvement program are included for funding under this program, including: Runway 4/22 MALSR, RVR and PAPI installation; Runway 13 PAPI installation; Runways 22 and 31 REIL installation; and airport traffic control tower (ATCT) construction. These are included for F&E funding in the **Exhibit A1, Proposed Capital Improvement Projects** of **Appendix A**.

STATE AID TO AIRPORTS

In support of the state airport system, the State of Oregon also participates in airport development projects through the Financial Aid to Municipalities (FAM). Presently, the maximum yearly state contribution is $10,000.

The State of Oregon also recognizes the importance of pavement maintenance by inspecting system airports on a three- year rotation. Once identified as a pavement maintenance eligible item, the state participates with the airport sponsor on a percentage basis to perform pavement surface improvement. North Bend Municipal Airport would be eligible on a 50 percent basis, as a commercial service airport that enplanes over 10,000 passengers annually.

Within the capital program North Bend Municipal Airport is requesting $400,000 in state aid for pavement maintenance through the long-term planning period.

LOCAL FUNDING

The balance of project costs, after consideration has been given to grants and PFCs, must be funded through local resources. There are several alternatives for local financing of airport projects, including: airport revenues; loans and/or bonds; and leasehold financing. Funding transfers from the Oregon International Port of Coos Bay are possible, but not probable. In the recent past, a loan for the construction of the T-hangars was secured through the state revolving loan program with debt service of $25,512 per year over 20 years. The Airport Business Park improvements were accomplished with a state public works projects loan. The loan runs for 25 years with debt service payments of $9,185 per year.

AIRPORT OPERATING FUND

Since July 1, 1999 the airport and adjacent business park have been managed and operated by the Oregon International Port of Coos Bay with the City of North Bend retaining ownership. The Port's Board of Commissioners took over management, contingent upon the Port District voters ratifying the agreement between the Port and the City of North Bend and approving a five-year tax levy (effective 1999) which dedicates $270,000 annually to the airport operating budget.

The Oregon International Port of Coos Bay operates the airport from a separate funding account. Included in the airport fund are a number of various revenue and expense accounts. The following are the specific revenue accounts, as shown in the following Operating Revenues table: investment earnings; tax levy; Aeronautical/Fuel Fees/FBOs (fuel fees and FBO lease income);Aeronautical/Storage/Hangar (aircraft storage rentals and hangar leases); FAA weather contracting; Non-aeronautical (terminal space leases, non aircraft-related hangar space leases, and advertising income); apartment rentals; and business park leases.

Included in the Operating Expenses table are the following expenditure accounts: personnel services and benefits, supplies, utilities, professional services (including the fire service contract), and building/equipment expenditures. Debt service on the loans for the T-hangar construction and the business park infrastructure installation is calculated separately from the operating expenses and included as part of the overall budget in the **Capital Improvement Funding** section of each planning term table.

A summary of the historical and budgeted revenues and expenses at the airport, from 1999-2000 to 2001-2002, have been included in **Table 7B**. The projections of revenues and expenses are included in **Tables 7C-7F** and discussed below.

Revenues

Investment earnings are difficult to predict, as markets may vary widely from year-to-year. Nor is it certain that there will be a balance from which to grow investment earnings. Therefore, a conservative assumption has been made, keeping this figure static at $6,000 annually through the long-term.

The tax levy is discontinued after 2003-2004, the last year of the approved five-year levy.

After projecting a slight loss from 2000-2001 to 2001-02 the account for Aeronautical/Fuel Fees/FBOs is forecast to grow at a conservative 2.5 percent annual rate. The revenue reduction was based on the loss of one of the two on-field FBOs.

The Aeronautical/Storage/Hangar rentals account is calculated based on the current incomes. The account revenues have been adjusted according to hangar development, as proposed in the CIP, and with respect to lost revenues due to demolition of the large hangar. Although the FBO-leased buildings are scheduled for demolition it is assumed that these leases will continue, even at another location. By 2004, one 14-place T-hangar should be completed, producing rental income of $200 per unit per month. (This may vary slightly up or down, as several of the hangars may be larger and produce greater income). Further hangar construction (one conventional hangar and 7 executive hangars) by the end of the intermediate term increases hangar revenues through the long-term planning period, as depicted in the revenue tables. Concurrent with these development projects is an increase in the debt service, as shown in the **Capital Improvement Funding** sections of revenues and expenses tables.

The airport contracts with the FAA to read weather instruments and record and supply that data for takeoffs, landings, and instrument approach information. This revenue is projected to remain the same through the forecast period.

The Non-aeronautical account includes income from non-aviation land leases in the large hangar, commercial terminal space, terminal advertising space rentals, and concessions. The rate of growth is assumed at 1.0 percent annually, with a one-time loss of income related to the loss of lease space within the large hangar.

Apartment rent revenues are lost after 2006-2007 following demolition for future road construction.

Likewise, within **Tables 7C** through **7F**, the Business Park revenue is shown to grow minimally (1.0 percent annually). This growth rate is based on a forecast of current trends (leasing available space and adjustment of current leases). It is possible that, apart from incurred development debt, future business park revenue may indeed supplement the lost operating revenues. Although not included in revenue (or expense) assumptions here, should development occur as proposed by the *North Bend Airport Business Park Master Plan*, the three-phase development plan estimates costs for the Business Park development at slightly over $1.15 million in infrastructure improvements. The Business Park would produce just under $4.8 million in net cash flow over 20 years.

As building demolitions occur, (indicated in **Exhibits B1, B2, and B3)** lost revenues are deducted from overall Business Park income. Should all buildings be removed within the time-frame determined in the CIP, and not replaced, the Port will have lost almost half of the original Business Park income.

Expenses

Tables 7C through **7F** also indicate general operating expenses for the airport. Operational expenses are anticipated to either increase or remain static. Those expense categories that increase over the planning period include: Salaries/Benefits (2 percent annually), Insurance/Legal (2 percent annually), Utilities/Operational (3 percent annually), and the Fire Service Contract (2 percent annually). The remaining categories are calculated at a static rate through the planning period. A net cash flow amount is calculated for each year, with deficits represented in parentheses.

Capital Improvement Funding

This section of the table shows the intended capital outlay for each year of planning and the amount of income from entitlements, F&E funding, PFCs and loans anticipated. This will help in identifying the outstanding balance to be funded. Where the intermediate and long-term capital projects have not been delineated as to specific year of implementation, the capital costs and loan incomes have been averaged over each participating year.

The loan debt service is also calculated for the proposed hangar construction projects. By totaling all figures, the excess or deficit can be indicated and help the Port to determine the appropriate amount of funding needed in each fiscal year. Although the intermediate through long-term years average the total capital costs, this will vary with the specific capital improvement project proposed for that year.

PLAN IMPLEMENTATION

The successful implementation of the North Bend Municipal Airport Master Plan will require sound judgment on the part of Port management with regard to implementation of projects to meet future activity demands, while maintaining the existing infrastructure and expanding this infrastructure to support new development.

While the projects included in the capital program have been divided into short, intermediate, and long-term planning periods, the Port will need to consider the scheduling of projects in a flexible manner, and add new projects from time to time to satisfy safety or design standards, or newly created demands.

As new buildings or pavement are added, the as-built information should be reflected on these drawings, and the revised drawings resubmitted to the FAA for approval. The updated Part 77 airspace drawings (with updated zoning ordinance) should be adopted by the planning departments in both the City of North Bend and Coos County, to ensure that towers or other high objects are not constructed in the runway approaches.

SUMMARY

The direction that the Port has chosen to take is one that optimizes the opportunities available to the airport:

Renovation of the existing terminal; removal of old buildings; and specific airport facilities improvements, both airside (i.e. airport traffic control tower and new precision approach capability) and landside (i.e. new terminal building and new hangars) all combine to rejuvenate the airport. Revenue enhancement is needed to support the future improvements. As the revenue and expense tables indicate, the combination of the loss of tax levy income and lost lease rents, as buildings are removed, will curtail cash flow. Given the added burden of the cost of improvements, the Port will be asked to wisely determine a direction that both generates new revenue and seeks financial backing in the form of federal aid and loans. Marketing and sound management will contribute a great deal to this impetus. The *Airport Business Park Master Plan* indicates a marketing strategy for greater revenue production.

Yearly application for financial aid from the FAA AIP program should, likewise, follow sound decision-making. The FAA has developed the National Priority System (NPS) that evaluates projects based on a combination of priority ranking of projects, airport type, and qualitative consideration of the airport's needs. The Capital Improvement Program is an effort to aid in this quest. Even with as much effort that has gone into development of the CIP, there will still be the need for updating and re-prioritizing as circumstances and requirements change.

TABLE 7B
Historical Revenues and Expenses
North Bend Municipal Airport

Operating Revenues	1999-00	2000-01	2001-02
Investment Earnings	$1,031	$2,500	$6,000
Tax Levy	$270,000	$270,000	$270,000
Aeronautical/Fuel Fees and FBOs	$88,354	$103,003	$102,811
Aeronautical/Storage/Hangar Rentals	$35,790	$58,766	$58,326
FAA Weather Contract	$191,531	$191,350	$191,350
Non-aeronautical	$45,164	$54,232	$47,408
Apartment Rentals	$22,901	$38,000	$39,360
Business Park Revenue	$226,249	$223,886	$229,791
Total Operating Revenues	$881,020	$941,737	$945,046
Operating Expenses	**1999-00**	**2000-01**	**2001-02**
Salaries/Benefits	$415,516	$434,994	$445,230
Insurance/Legal Services	$23,551	$34,678	$55,299
Office Expenses/Misc.	$25,617	$6,700	$12,550
Utilities/Operational Expenses	$89,844	$96,600	$119,400
Fees and Dues	$24,976	$19,400	$44,500
Maintenance	$45,556	$44,000	$43,000
Contracted Services	$50,225	$40,000	$50,000
Fire Service Contract	$176,456	$171,000	$201,075
Security (Police, Equipment, etc.)	$0	$0	$0
Total Operating Expenses	$851,741	$847,372	$971,054
Net Cash Flow	$29,279	$94,365	$(26,008)

Source: Oregon International Port of Coos Bay

TABLE 7C
Short Term Expenses and Revenues
North Bend Municipal Airport

Operating Revenues	2002-03	2003-04	2004-05	2005-06	2006-07
Investment Earnings	$6,000	$6,000	$6,000	$6,000	$6,000
Tax Levy	$270,000	$270,000	$0	$0	$0
Aeronautical/Fuel Fees and FBOs	$105,400	$108,000	$110,700	$113,500	$116,300
Aeronautical/Storage/ Hangar Rentals	$58,300	$58,300	$74,000	$74,000	$74,000
FAA Weather Contract	$191,400	$191,400	$191,400	$191,400	$191,400
Non-aeronautical	$47,900	$48,400	$48,900	$49,400	$49,900
Apartment Rentals	$39,360	$39,360	$39,360	$39,360	$39,360
Business Park Revenue	$232,100	$234,400	$236,700	$209,600	$206,200
Total Operating Revenues	$950,460	$955,860	$691,360	$667,560	$688,660

Operating Expenses	2002-03	2003-04	2004-05	2005-06	2006-07
Salaries/Benefits	$454,100	$463,200	$472,500	$482,000	$491,600
Insurance/Legal Services	$56,400	$57,500	$58,700	$59,900	$61,100
Office Expenses/Misc.	$12,550	$12,550	$12,550	$12,550	$12,550
Utilities/Operational Expenses	$123,000	$126,700	$130,500	$134,400	$138,400
Fees and Dues	$44,500	$44,500	$44,500	$44,500	$44,500
Maintenance	$43,000	$43,000	$43,000	$43,000	$43,000
Contracted Services	$50,000	$50,000	$50,000	$50,000	$50,000
Fire Service Contract	$205,100	$209,200	$213,400	$217,700	$222,100
Security (Police, Equipment, etc.)	$100,000	$100,000	$100,000	$100,000	$100,000
Total Operating Expenses	$1,088,650	$1,106,650	$1,125,150	$1,144,050	$1,163,250
Net Cash Flow (Rev-Exp)	($138,190)	($150,790)	($418,090)	($460,790)	($474,590)

Capital Improvement Funding	2002-03	2003-04	2004-05	2005-06	2006-07
Recommended CIP (-)	($6,184,600)	($6,447,483)	($3,562,121)	($1,593,230)	($2,114,000)
Entitlements (+)	$1,000,000	$1,000,000	$1,000,000	$1,000,000	$1,000,000
Facilities and Equipment Program (F&E) (+)	$5,500,000	$2,000,000	$0	$0	$0
PFCs (+)	$113,000	$114,700	$116,400	$118,100	$119,900
State Hangar Loan (+)	$0	$0	$250,000	$0	$0
Debt Service (-)	($35,000)	($35,000)	($60,000)	($60,000)	($60,000)
Excess or (Deficit)	$393,400	($3,367,783)	($2,255,721)	($535,130)	($1,054,100)

Source: Coffman Associates

TABLE 7D
Intermediate Term Expenses and Revenues
North Bend Municipal Airport

Operating Revenues	2007-08	2008-09	2009-10	2010-11	2011-12
Investment Earnings	$6,000	$6,000	$6,000	$6,000	$6,000
Tax Levy	$0	$0	$0	$0	$0
Aeronautical/Fuel Fees and FBOs	$119,200	$122,200	$125,300	$128,400	$131,600
Aeronautical/Storage/ Hangar Rentals	$74,100	$74,100	$74,100	$74,100	$166,700
FAA Weather Contract	$191,400	$191,400	$191,400	$191,400	$191,400
Non-aeronautical	$35,100	$35,500	$35,900	$36,300	$36,700
Apartment Rentals	$0	$0	$0	$0	$0
Business Park Revenue	$158,100	$159,700	$161,300	$162,900	$164,500
Total Operating Revenues	$583,900	$588,900	$594,000	$599,100	$696,900

Operating Expenses	2007-08	2008-09	2009-10	2010-11	2011-12
Salaries/Benefits	$501,400	$511,400	$521,600	$532,000	$542,600
Insurance/Legal Services	$62,300	$63,500	$64,800	$66,100	$67,400
Office Expenses/Misc.	$12,550	$12,550	$12,550	$12,550	$12,550
Utilities/Operational Expenses	$142,600	$146,900	$151,300	$155,800	$160,500
Fees and Dues	$44,500	$44,500	$44,500	$44,500	$44,500
Maintenance	$43,000	$43,000	$43,000	$43,000	$43,000
Contracted Services	$50,000	$50,000	$50,000	$50,000	$50,000
Fire Service Contract	$226,500	$231,000	$235,600	$240,300	$245,100
Security (Police, Equipment, etc.)	$100,000	$100,000	$100,000	$100,000	$100,000
Total Operating Expenses	$1,182,850	$1,202,850	$1,223,350	$1,244,250	$1,265,650
Net Cash Flow (Rev-Exp)	$(598,950)	$(613,950)	$(629,350)	$(645,150)	$(568,750)

Capital Improvement Funding	2007-08	2008-09	2009-10	2010-11	2011-12
Recommended CIP (-)	$(2,904,000)	$(2,904,000)	$(2,904,000)	$(2,904,000)	$(2,904,000)
Entitlements (+)	$1,000,000	$1,000,000	$1,000,000	$1,000,000	$1,000,000
F&E (+)	$0	$0	$0	$0	$0
PFCs (+)	$121,700	$123,500	$125,400	$127,300	$129,200
State Hangar Loan	$0	$0	$0	$0	$800,000
Debt Service (-)	$(60,000)	$(60,000)	$(60,000)	$(60,000)	$(140,000)
Excess or (Deficit)	$(1,842,300)	$(1,840,500)	$(1,838,600)	$(1,836,700)	$(1,114,800)

Source: Coffman Associates

TABLE 7E
Long Term Expenses and Revenues (Part 1)
North Bend Municipal Airport

Operating Revenues	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**2016-17**
Investment Earnings	$6,000	$6,000	$6,000	$6,000	$6,000
Tax Levy	$0	$0	$0	$0	$0
Aeronautical/Fuel Fees and FBOs	$134,900	$138,300	$141,800	$145,300	$148,900
Aeronautical/Storage/ Hangar Rentals	$166,700	$166,700	$166,700	$166,700	$166,700
FAA Weather Contract	$191,400	$191,400	$191,400	$191,400	$191,400
Non-aeronautical	$37,100	$37,500	$37,900	$38,300	$38,700
Apartment Rentals	$0	$0	$0	$0	$0
Business Park Revenue	$147,400	$148,900	$150,400	$151,900	$153,400
Total Operating Revenues	$683,500	$688,800	$694,200	$699,600	$705,100
Operating Expenses	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**2016-17**
Salaries/Benefits	$553,500	$564,600	$575,900	$587,400	$599,100
Insurance/Legal Services	$68,700	$70,100	$71,500	$72,900	$74,400
Office Expenses/Misc.	$12,550	$12,550	$12,550	$12,550	$12,550
Utilities/Operational Expenses	$165,300	$170,300	$175,400	$180,700	$186,100
Fees and Dues	$44,500	$44,500	$44,500	$44,500	$44,500
Maintenance	$43,000	$43,000	$43,000	$43,000	$43,000
Contracted Services	$50,000	$50,000	$50,000	$50,000	$50,000
Fire Service Contract	$250,000	$255,000	$260,100	$265,300	$270,600
Security (Police, Equipment, etc.)	$100,000	$100,000	$100,000	$100,000	$100,000
Total Operating Expenses	$1,287,550	$1,310,050	$1,332,950	$1,356,350	$1,380,250
Net Cash Flow (Rev-Exp)	$(604,050)	$(621,250)	$(638,750)	$(656,750)	$(675,150)
Capital Improvement Funding	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**2016-17**
Recommended CIP (-)	$(289,000)	$(289,000)	$(289,000)	$(289,000)	$(289,000)
Entitlements (+)	$1,000,000	$1,000,000	$1,000,000	$1,000,000	$1,000,000
F&E (+)	$0	$0	$0	$0	$0
PFCs (+)	$131,100	$133,100	$135,100	$137,100	$139,200
State Hangar Loan	$0	$0	$0	$0	$0
Debt Service (-)	$(140,000)	$(140,000)	$(140,000)	$(140,000)	$(140,000)
Excess or (Deficit)	$702,100	$704,100	$706,100	$708,100	$710,200

Source: Coffman Associates

TABLE 7F
Long Term Expenses and Revenues (Part 2)
North Bend Municipal Airport

Operating Revenues	2017-18	2018-19	2019-20	2020-21	2021-22
Investment Earnings	$6,000	$6,000	$6,000	$6,000	$6,000
Tax Levy	$0	$0	$0	$0	$0
Aeronautical/Fuel Fees and FBOs	$152,600	$156,400	$160,300	$164,300	$168,400
Aeronautical/Storage/Hangar Rentals	$166,700	$166,700	$166,700	$166,700	$166,700
FAA Weather Contract	$191,400	$191,400	$191,400	$191,400	$191,400
Non-aeronautical	$39,100	$39,500	$39,900	$40,300	$40,700
Apartment Rentals	$0	$0	$0	$0	$0
Business Park Revenue	$154,900	$156,400	$158,000	$159,600	$161,200
Total Operating Revenues	$710,700	$716,400	$722,300	$728,300	$734,400

Operating Expenses	2017-18	2018-19	2019-20	2020-21	2021-22
Salaries/Benefits	$611,100	$623,300	$635,800	$648,500	$661,500
Insurance/Legal Services	$75,900	$77,400	$78,900	$80,500	$82,100
Office Expenses/Misc.	$12,550	$12,550	$12,550	$12,550	$12,550
Utilities/Operational Expenses	$191,700	$197,500	$203,400	$209,500	$215,800
Fees and Dues	$44,500	$44,500	$44,500	$44,500	$44,500
Maintenance	$43,000	$43,000	$43,000	$43,000	$43,000
Contracted Services	$50,000	$50,000	$50,000	$50,000	$50,000
Fire Service Contract	$276,000	$281,500	$287,100	$292,800	$298,700
Security (Police, Equipment,etc.)	$100,000	$100,000	$100,000	$100,000	$100,000
Total Operating Expenses	$1,404,750	$1,429,750	$1,455,250	$1,481,350	$1,508,150
Net Cash Flow	$(694,050)	$(713,350)	$(732,950)	$(753,050)	$(773,750)

Capital Improvement Funding	2017-18	2018-19	2019-20	2020-21	2021-22
Recommended CIP (-)	$(289,000)	$(289,000)	$(289,000)	$(289,000)	$(289,000)
Entitlements (+)	$1,000,000	$1,000,000	$1,000,000	$1,000,000	$1,000,000
F&E (+)	$0	$0	$0	$0	$0
PFCs (+)	$141,300	$143,400	$145,600	$147,800	$150,000
State Hangar Loan	$0	$0	$0	$0	$0
Debt Service (-)	$(140,000)	$(140,000)	$(140,000)	$(140,000)	$(130,800)
Excess or (Deficit)	$712,300	$714,400	$716,600	$718,800	$730,200

Source: Coffman Associates

North Bend Municipal Airport

Appendix A
PROPOSED CAPITAL IMPROVEMENT PROJECTS

North Bend Municipal Airport–Master Plan Update
Proposed Capital Improvement Projects (September 2002)

	Project Description	Total Cost	Funding Source: Port/PFC	State*	FAA Facilities*	FAA ADO*	Private
Phase I (2002-2006)							
2002	Photo ID System and Access Locks	$50,000	$5,000	$0	$0	$45,000	$0
	Security Radio System (base station and 12 portables)	$20,000	$2,000	$0	$0	$18,000	$0
	Security Vehicles (2)	$50,000	$5,000	$0	$0	$45,000	$0
	Airport Security Fencing	$150,000	$15,000	$0	$0	$135,000	$0
	Runway 4/22 MALSR & RVR Installation	$5,500,000	$0	$0	$5,500,000	$0	$0
	Runway 4/22 PAPI Installation	$170,000	$17,000	$0	$0	$153,000	$0
	Runway 13 PAPI Installation	$69,600	$6,960	$0	$0	$62,640	$0
	Runway 22 and Runway 31 REILs Installation	$175,000	$17,500	$0	$0	$157,500	$0
	Subtotal 2002	$6,184,600	$68,460	$0	$5,500,000	$616,140	$0
2003	Existing Terminal Renovation	$750,000	$375,000	$0	$0	$375,000	$0
	Runway 13/31 and Parallel Taxiway Improvements[3]	$1,975,777	$197,578	$0	$0	$1,778,199	$0
	Runway 13/31 Pavement Width Adjustment	$91,650	$9,165	$0	$0	$82,485	$0
	Runway 13/31 Lighting Reconstruction	$345,800	$34,580	$0	$0	$311,220	$0
	Terminal Apron Rehabilitation	$284,256	$28,426	$0	$0	$255,830	$0
	Emergency Generator for Airfield and Terminal Complex	$200,000	$200,000	$0	$0	$0	$0
	Parallel Taxiway C Extension and Connector Taxiways	$600,000	$60,000	$0	$0	$540,000	$0
	ATCT Construction	$2,000,000	$0	$0	$2,000,000	$0	$0
	Environmental Assessment (4/22 Parallel Taxiway and Safety Area)	$200,000	$20,000	$0	$0	$180,000	$0
	Subtotal 2003	$6,447,483	$924,748	$0	$2,000,000	$3,522,735	$0
2004	Building Abatement and Demolition (for T-Hangar Construction)	$49,200	$49,200	$0	$0	$0	$0
	T-Hangar Construction[2]	$278,921	$243,892	$0	$0	$35,029	$0
	Building Maintenance	$600,000	$600,000	$0	$0	$0	$0
	Runway 4/22 Parallel Taxiway Relocation & Connector Taxiway Improvements	$2,634,000	$263,400	$0	$0	$2,370,600	$0
	Subtotal 2004	$3,562,121	$1,156,492	$0	$0	$2,405,629	$0
2005	Building Abatement and Demolition (for ARFF Construction)	$183,200	$18,320	$0	$0	$164,880	$0
	ARFF Building Replacement	$810,030	$135,030	$0	$0	$675,000	$0
	Building Maintenance	$600,000	$600,000	$0	$0	$0	$0
	Subtotal 2005	$1,593,230	$753,350	$0	$0	$839,880	$0
2006	General Airfield Pavement Maintenance	$50,000	$25,000	$25,000	$0	$0	$0
	Building Maintenance	$195,000	$195,000	$0	$0	$0	$0
	Runway 4/22 Improvements	$1,663,000	$166,300	$0	$0	$1,496,700	$0
	Runway 22 Safety Area Improvements	$175,000	$17,500	$0	$0	$157,500	$0
	Close Runway 16/34	$31,000	$31,000	$0	$0	$0	$0
	Subtotal 2006	$2,114,000	$434,800	$25,000	$0	$1,654,200	$0
	Subtotal Phase I	**$19,901,434**	**$3,337,850**	**$25,000**	**$7,500,000**	**$9,038,584**	**$0**
Phase II (2007-2011)							
	Phase I-Building Abatement and Demolition (for Terminal)	$1,482,040	$741,020	$0	$0	$741,020	$0
	Phase I-Building Purchase (for land lease)	$427,300	$213,650	$0	$0	$213,650	$0
	Phase I-Terminal Construction[1]	$9,666,000	$6,666,000	$0	$0	$3,000,000	$0
	Parking Improvements[4]	$664,000	$664,000	$0	$0	$0	$0
	Terminal Landscaping	$150,000	$150,000	$0	$0	$0	$0
	General Building Abatement and Demolition	$220,600	$220,600	$0	$0	$0	$0
	General Landside Pavement and Street Improvements	$450,000	$450,000	$0	$0	$0	$0
	Fuel Farm Relocation and Expansion	$150,000	$0	$0	$0	$0	$150,000
	Taxiway K and Apron Slurry Seal	$10,000	$1,000	$0	$0	$9,000	$0
	Conventional Hangar Construction[2]	$314,319	$271,215	$0	$0	$43,104	$0
	Executive Hangar Construction[2]	$534,875	$514,175	$0	$0	$20,700	$0
	General Airfield Pavement Maintenance	$250,000	$125,000	$125,000	$0	$0	$0
	Master Plan Update	$200,000	$20,000	$0	$0	$180,000	$0
	Subtotal Phase II	**$14,519,134**	**$10,036,660**	**$125,000**	**$0**	**$4,207,474**	**$150,000**
Phase III (2012-2021)							
	Phase II-Building Abatement and Demolition (for Terminal)	$97,700	$48,850	$0	$0	$48,850	$0
	Phase II-Terminal Construction[1]	$995,300	$497,650	$0	$0	$497,650	$0
	Parking Improvements[4]	$644,000	$644,000	$0	$0	$0	$0
	Terminal Landscaping	$50,000	$50,000	$0	$0	$0	$0
	General Landside Pavement and Street Improvements	$50,000	$50,000	$0	$0	$0	$0
	General Pavement Maintenance	$500,000	$250,000	$250,000	$0	$0	$0
	Runway 4/22 Lighting Reconstruction	$351,400	$35,140	$0	$0	$316,260	$0
	Master Plan Update	$200,000	$20,000	$0	$0	$180,000	$0
	Subtotal Phase III	**$2,888,400**	**$1,595,640**	**$250,000**	**$0**	**$1,042,760**	**$0**
	Cumulative Total =	**$37,308,968**	**$14,970,150**	**$400,000**	**$7,500,000**	**$14,288,818**	**$150,000**

* ELIGIBILITY FOR FAA OR STATE FUNDING DOES NOT INSURE THAT FUNDS WILL BE AVAILABLE OR GRANTED FOR THE PROJECT
- ALL COST ESTIMATES ARE IN 2001 DOLLARS
- TOTAL COSTS INCLUDE CONSTRUCTION, CONSTRUCTION STAKING, MOBILIZATION, ENGINEERING, ADMINISTRATION, AND CONTINGENCY, AS APPLICABLE
- ADDITIONAL PORT IMPROVEMENT COSTS ARE DISCUSSED IN THE OREGON INTERNATIONAL PORT OF COOS BAY AIRPORT BUSINESS PARK MASTER PLAN

1 INCLUDES COSTS FOR ACCESS ROADS, AUTOMOBILE PARKING, RENTAL CAR SERVICE BUILDING, UTILITIES, SITE WORK, AND LEASE REVENUE LOST

2 INCLUDES ASSOCIATED APRON AND AUTOMOBILE PARKING AREAS

3 INCLUDES RE-STRIPING TO NON-PRECISION

4 PARKING LOT CONSTRUCTION COSTS TO BE COVERED BY PFC'S

FILE NAME: I:/PROJECTS/PORTOFCOOSBAY/819142/OFFICE/EXCEL/NORTHBENDMPCIP.XLS

Exhibit A1
PROPOSED CAPITAL IMPROVEMENT PROJECTS

Alternative #2 Terminal Site Costs

Phase I

	Area	Unit Cost	Subtotal
Terminal	13,000sf	$200/sf	$2,600,000
Site Work			$800,000
Utilities			$19,200
New Aircraft Apron	261,000sf	$11.75/sf	$3,066,750
Paved Automobile Parking	127,549sf	$5.20/sf	$663,255
Terminal Loop & Access Roads	115,143sf	$7.17/sf	$825,576
Rental Car Service Building	1,500sf	$150.00/sf	$225,000
Demolition of Existing Buildings (including large hangar)			$1,650,440
Cost to Purchase Buildings In Land Lease			$427,300
Beacon Relocation			$52,500
		Subtotal =	$10,330,021
		TOTAL =	**$10,330,000**

Phase II

Expanded Terminal	4,000sf	$200/sf	$800,000
Site Work			$97,823
Paved Automobile Parking	123,806sf	$5.20/sf	$643,792
Demolition of Existing Buildings			$97,700
		Subtotal =	$1,639,315
		TOTAL =	**$1,639,300**

Exhibit A2
TERMINAL SITE COSTS

Appendix B
BUILDING DEMOLITION COSTS

North Bend Municipal Airport

North Bend Municipal Airport-Building Maintenance, Abatement and Demolition Summary
October 17, 2001

The following buildings are identified per the North Bend Airport Business Park plan (see attached drawing). These identification numbers are to be revised at a later date to match the airport's numbering system.

Terminal Area Phase I Required Building Demolition

Building #15-Bay Area Detail:
Demolition and asbestos abatement = $11,900

Building #16-Warehouse:
Demolition and asbestos abatement = $65,200

Building #17-Storage Building:
Demolition and asbestos abatement = $20,000

Building #18-City of North Bend Public Works Shop:
New Roof = $50,000
Demolition and asbestos abatement = $232,700

Building #20-14 unit Apartment Building:
Demolition and asbestos abatement = $93,000

Building #21-Ripper Apartments:
Demolition and asbestos abatement = $100,000

Building #22:
Purchase building from land lease holder = $427,300
Demolition and asbestos abatement = $111,440

Building #36-Storage Building w/old base broiler and steam plant:
Demolition and asbestos abatement = $20,000

Building #43
Demolition and asbestos abatement = $7,800

Building #44
Demolition and asbestos abatement = $21,900

Building #45
Demolition and asbestos abatement = $2,600

Building #47-Large Hangar

New Roof = $300,000
Building Maintenance = $250,000
Demolition and asbestos abatement = $795,500

Total Building Maintenance = $600,000
Total Terminal Phase I Building Abatement and Demolition = $1,482,040
Total Building Purchase = $427,300

Terminal Area Phase II Required Building Demolition

Building #19-American Legion Building:
Demolition and asbestos abatement = $97,700

Total Terminal Phase II Building Abatement and Demolition = $97,700

ARFF Building Phase I Required Demolition

Building #23 & 24-FedEx and Lasting Impressions:
Demolition and asbestos abatement = $128,400

Building #37-Airport Fire Station:
Demolition and asbestos abatement = $54,800

Total ARFF Phase I Building Abatement and Demolition = $183,200

T-Hangar Building Phase I Required Demolition

Building #41-Coos Aviation Administration Building:
Demolition and asbestos abatement = $29,200

Building #42-Scarf Building:
Demolition and asbestos abatement = $20,000

Total T-Hangar Phase I Building Abatement and Demolition = $49,200

Maintenance Costs for Buildings to Remain (all costs are to be covered by Port)

Building #10-Old School Board Building:
Asbestos abatement = $100,000
Interior rehabilitation = $500,000

Building #31-Kemro:
Asbestos abatement and siding = $20,000

Building #39-Airport Maintenance Building:
Asbestos abatement and new siding = $10,000
Interior rehab. & meeting code = $5000
Exterior rehab. & new roof = $50,000

Building #40-Coos Aviation Hangar:
Asbestos abatement and new siding = $40,000
New roof = $50,000
Interior rehab. & meeting code = $20,000

Total Building Maintenance = $795,000

General Port Building Demolition Phase I (all costs are to be covered by the Port)

Building #8-South Coast Hospice:
Demolition and asbestos abatement = $60,000

Building #26 & 27-US Office Products:
Demolition and asbestos abatement = $100,600

Building #28-Storage Building:
Demolition and asbestos abatement = $20,000

Building #30-Auto Detailing:
Demolition and asbestos abatement = $30,000

Building #38-Storage Building:
Demolition and asbestos abatement = $10,000

Total Building Abatement and Demolition Phase I = $220,600

General Port Building Demolition Phase II (all costs are to be covered by the Port)

Building #25:
Purchase building from land lease holder = $132,000
Demolition and asbestos abatement = $34,500

Building #32:
Purchase building from land lease holder = $120,000
Demolition and asbestos abatement = $31,300

Building #33:
Demolition and asbestos abatement = $20,400

Building #34:
Purchase building from land lease holder = $100,000
Demolition and asbestos abatement = $26,080

Building #35-Coos Bay Fabrication:
Demolition and asbestos abatement = $206,200

Total Building Purchase, Abatement and Demolition Phase II = $670,480

Appendix C
CONSTRUCTION COST FOR TERMINAL ALTERNATIVES

North Bend Municipal Airport

North Bend Municipal Airport Master Plan
Construction Costs for Terminal Alternatives

August 2, 2001

Prepared by Ron Wade, Landrum & Brown, Lorelei Mesic, W&H Pacific and Al Benkendorf, Benkendorf Associates.

To assist the Port of Coos Bay in deciding a Preferred Terminal Area Alternative, the following document has been prepared. Construction costs for the various alternatives have been calculated and summarized.

The Terminal Alternatives evaluated are those presented to the Planning Advisory Committee on July 12, 2001. Alternative 1 is at the Existing Terminal site. Alternative 2 is at the Existing Hangar site and Alternative 3 is on the Plateau. In addition, Richard Turi of Richard P. Turi Architecture & Planning, presented an option to reconstruct the existing hangar. That summary is presented below.

In 2000 the Port Commission asked Richard Turi to analyze the existing terminal building and prepare options for reconfiguring/reconstructing the facility. Two options were presented which included shifting the inplaning and deplaning corridors, moving the baggage claim area to the south to improve circulation, move the Airport Operation area upstairs and reconfigure the ticket counters. The options also included a new façade to update the exterior image of the building. The "rough" cost estimate for this option was $750,000.00

Terminal Construction Unit Cost

A conceptual construction unit cost of $200 per square foot was used for the on-grade terminal building alternatives in 2001. This generic cost includes typical terminal furnishings, baggage conveyors, contractor and architectural fees for this type of building. It does not include security equipment or airline furnished equipment normally provided by tenants.

Other "soft" development costs are not included in this unit such as construction administration costs of the owner and financing.

For Alternative 3, on the Plateau, construction will be more expensive. The estimated costs will be 15% higher or $230 per square foot. The higher cost results from larger quantities of building exterior area, stepped foundations and framing necessary on a sloping site. In addition to building costs, the Plateau site will need elevators, sloping baggage conveyors and potentially escalators. This additional equipment has been shown as separate line items so their cost can be seen as additive to the building construction.

These 2001 construction unit costs need inflation factors applied to them. See the next section for the inflated construction unit costs used in the Table.

Construction Cost Escalation

Construction costs increase annually. An escalation of 3% per year was used to allow for inflation in terminal construction cost. For Phase 1 construction, the inflation rate was applied for six years, assuming the terminal would open or substantial construction payments will occur in 2007 for any of the alternatives. The escalated terminal construction cost used in the Table is $236 per square foot for Alternatives 1 and 2 and $271 per square foot for Alternative 3.

For all alternatives, a single Phase 2 terminal construction effort has been proposed to buildout an additional 4000 square feet of the terminal. Phase 2 terminal construction is assumed to open in 2012 that is five years after the initial construction phase. An additional 15% increase was applied to the 2007 unit terminal construction cost for Phase 2 construction or $266 per square foot for Alternatives 1 and 2 and $312 per square foot for Alternative 3.

These same escalation percentages were used for all of the costs presented.

Terminal Area

For Alternatives 1 and 2, it was assumed that a 13,000 square feet terminal would be built in Phase 1. A terminal built on the Alternative 3 site will need more area to function on a sloping site. A building area increase was assumed of 25% beyond the other two alternatives to account for increases needed for stairs, ramps, elevators and additional building area at the aircraft apron level. Using this factor, the terminal size for Alternative 3 is projected to be 14, 950 square feet.

Operational Costs of Elevators and Escalators

Maintenance costs will differ for the three alternatives. Total maintenance costs are difficult to quantify for each alternative. The key difference is Alternative 3 has elevator and potentially escalator equipment. Vendors were contacted about the cost to maintain elevators and escalators. The budget numbers stated in the following paragraphs are in 2001 dollars and are not escalated or specific to North Bend labor costs.

A vendor said expect a pair of hydraulic elevators to have a labor only maintenance cost of about $2000 per year for each of the first five years after construction. Parts would be additional.

Escalators have more moving parts and need more intensive maintenance. The maintenance budget for a pair of escalators would be $12,000 annually for the first years after an escalator enters service. This estimate includes parts and labor.

Utilities

Utilities were reviewed and estimates made as to the cost to bring the appropriate utilities to each site. The utilities included are storm sewer, sanitary sewer, telephone, power, water, gas and fiberoptics. It was assumed that gas and fiberoptics would have no costs to the airport associated with their installation, with this cost being covered by the provider.

General Construction

Costs were also determined for site work, apron pavement, terminal loop and access roadways, parking lots, hangar replacement and building demolition. Costs were included for construction contingency, engineering and administration, mobilization and construction staking. The inflation costs (see Construction Cost Escalation at the beginning of this report) were also included in these costs. All major excavation was assumed to occur during the first phase of construction.

Lost Lease Revenue

All three building alternatives impact existing land and building leases. When buildings are demolished to make room for the new terminal the impact to the Port will be in the form of lost lease revenue. After discussions with Allan Rumbaugh and Al Benkendorf it was decided, for purposes of this analysis, to only indicate the impact to the first years budget. In addition the magnitude of the lost revenue verses the construction cost would not impact the alternative ranking.

Acquisition of Lease Holds
The project will also involve the acquisition of existing lease holds, for airport owned assets and assets owned by others. This type of analysis is a very detailed process and that for the purposes of this cost comparison will not be conducted. The capital cost will increase for each alternative, however, the magnitude of adding these costs would not impact the alternative ranking.

The financial analysis chapter of the Master Plan will address the impacts of the lease hold acquisition on the selected alternative for the terminal.

Conclusion
Constructing the new terminal at its current location is the least costly alternative. Construction of the terminal on the plateau is the most costly. The reasons for the cost differences can be seen in the cost breakdowns provided.

Summary of Costs

Location	**Phase 1**	**Phase 2**	**Grand Total**
Alternative 1 at the Existing Terminal site:	$8,302,781	$1,516,000	$9,818,781
Alternative 2 at the Existing Hangar site:	$9,563,745	$1,514,000	$11,077,745
Alternative 3 on the Plateau:	$12,491,735	$1,707,000	$14,198,735

Table of Cost Comparisons between Alternatives

Alternative 1 at the Existing Terminal site

Phase 1 for Terminal opening in 2007

	Area	Unit cost	Subtotal
• Terminal	13,000 sf	$236 /sf	$3,068,000
• Site Work (includes asphalt removal, removal of structures and obstructions, excavation necessary beyond the pavement sections, sidewalks, landscaping and signing)			$665,800
• Utilities			$19,350
• New aircraft apron (Assume all the apron adjacent to the terminal occurs in Phase 1)	204,000 sf	$11.75 /sf	$2,397,000
• Paved automobile parking	60,000 sf	$5.20 /sf	$312,000
• Employee and rental car parking areas	25,200 sf	$5.20 /sf	$131,040

• Terminal loop roads	1,600 lf	$213.50 /lf	$341,600
• Terminal access roads	270 lf	$213.50 /lf	$57,645
• Rental car service building	1,500 sf	$150.00 /sf	$225,000
• ARFF	5,000 sf	$150.00 /sf	$750,000

(The ARFF replacement is not required by the alternative configuration.)

• Demolition of existing buildings	61,465 sf	$3.85 /sf	$236,641

Demolition of buildings necessary for relocating the terminal surface parking and roads will occur no later than 2005.

• Demolition of the existing terminal	13,300 sf	$4.40 /sf	$58,520
• Lease revenue lost on demolished buildings (see attached summary)			$40,185
TOTAL ALTERNATIVE #1 PHASE 1			**$8,302,781**

Phase 2 Terminal Expansion opening in 2012

	Area	Unit cost	Subtotal
• Expanded Terminal	4,000 sf	$266 /sf	$1,064,000
• Site Work			$110,000
• Paved automobile parking	60,000 sf	$5.70 /sf	$342,000
TOTAL ALTERNATIVE #1 PHASE 2			**$1,516,000**
GRAND TOTAL ALTERNATIVE #1			**$9,818,781**

Alternative 2 at the Existing Hangar site

Phase 1 for Terminal opening in 2007

	Area	Unit cost	Subtotal
• Terminal	13,000 sf	$236 /sf	$3,068,000
• Site work			$652,200

(includes asphalt removal, removal of structures and obstructions, excavation necessary beyond the pavement sections, sidewalks, landscaping and signing)

• Utilities			$19,200

• New aircraft apron (Assume all the apron adjacent to the terminal occurs in Phase 1)	204,000 sf	$11.75 /sf	$2,397,000
• Paved automobile parking	60,000 sf	$5.20 /sf	$312,000
• Employee and rental car parking areas	25,200 sf	$5.20 /sf	$131,040
• Terminal loop roads	1,600 lf	$213.50 /lf	$341,600
• Terminal access roads	590 lf	$213.50 /lf	$125,965
• Rental car service building	1,500 sf	$150.00 /sf	$225,000
• ARFF (The ARFF replacement is not required by the alternative configuration.)	5,000 sf	$150.00 /sf	$750,000
• Demolition of existing buildings	52,826 sf	$3.85 /sf	$203,380
• Demolition of the existing Terminal	13,300 sf	$4.40 /sf	$58,520
• Demolition of the existing Hangar	117,000 sf	$3.85 /sf	$450,450
• Build replacement hangar (includes hangar parking and adjacent apron/taxilane pavement)			$772,000
• Lease revenue lost on demolished buildings			$57,390
TOTAL ALTERNATIVE #2 PHASE 1			**<u>$9,563,745</u>**

<u>Phase 2</u> Terminal Expansion opening in 2012

	<u>Area</u>	<u>Unit cost</u>	<u>Subtotal</u>
• Expanded Terminal	4,000 sf	$266 /sf	$1,064,000
• Site Work			$108,000
• Paved automobile parking	60,000 sf	$5.70 /sf	$342,000
TOTAL ALTERNATIVE #2 PHASE 2			**$1,514,000**
GRAND TOTAL ALTERNATIVE #2			**$11,077,745**

Alternative 3 on the Plateau

Phase 1 for Terminal opening in 2007

	Area	Unit cost	Subtotal
• Terminal	14,950 sf	$271 /sf	$4,057,500
• Elevators, hydraulic	2 ea	$60,000 /ea	$120,000
• Escalators (optional pair)			$200,000
• Baggage system increases			$30,000
• Site Work (includes asphalt removal, removal of structures and obstructions, excavation necessary beyond the pavement sections, sidewalks, landscaping and signing)			$2,080,000
• Utilities			$175,000
• Retaining wall	16,500 sf	$52.50 /sf	$866,250
• New Taxiway Pavement	23,000 sf	$3.45 /sf	$79,350
• New aircraft apron (Assume all the apron adjacent to the terminal occurs in Phase 1)	204,000 sf	$11.75 /sf	$2,397,000
• Paved automobile parking	60,000 sf	$5.20 /sf	$312,000
• Employee and rental car parking areas	25,200 sf	$5.20 /sf	$131,040
• Terminal loop roads	1,600 lf	$213.50 /lf	$341,600
• Terminal access roads	870 lf	$213.50 /lf	$185,745
• Rental car service building	1,500 sf	$150.00 /sf	$225,000
• ARFF (The ARFF replacement is not required by the alternative configuration.)	5,000 sf	$150.00 /sf	$750,000
• Demolition of existing buildings	24,300 sf	$3.85 /sf	$93,555
• Demolition of the existing terminal Not required			
• Demolition of the existing hangar Not required			
• Build replacement hangar			

Not required

- Build replacement T hangar (includes hangar parking and adjacent apron/taxilane pavement) — $424,000

- Lease revenue lost . on demolished buildings — $23,695

TOTAL ALTERNATIVE #3 PHASE 1 — **$12,491,735**

Phase 2 Terminal Expansion opening in 2012

	Area	Unit cost	Subtotal
• Expanded Terminal	4,000 sf	$312 /sf	$1,250,000 rounded
• Site Work			$115,000
• Paved automobile parking	60,000 sf	$5.70 /sf	$342,000
TOTAL ALTERNATIVE #3 PHASE 2			**$1,707,000**
GRAND TOTAL ALTERNATIVE #3			**$14,198,735**

North Bend
Municipal Airport

Chapter Eight
AIRPORT PLANS

Airport Plans

INTRODUCTION

The airport plans are one of the last steps in developing a master plan. They are a pictorial representation and summarization of the efforts made in the master planning process. The previous chapters on Inventory, Forecasting, Facility Needs Evaluation, Airport Development Alternatives and Terminal Development Alternatives and the reviews provided by the Planning Advisory Committee (PAC) supply the basis for the existing and future airport layouts that are shown in the airport layout drawings. Please note that the improvements necessary to relocate the 4/22 parallel taxiway and expand the Runway 22 safety area were not addressed in previous chapters. These improvements were added after FAA review confirmed that the new design aircraft is a C-III as opposed to the B-III category originally assumed. This approach category upgrade for the design aircraft dictated a shift of the parallel taxiway to obtain separation and larger safety areas for the runway.

The basemapping developed for the previous master plan airport layout drawings was used for this updated set of drawings. An aerial photo of the airport is also used as a basemap when appropriate.

AIRPORT LAYOUT DRAWINGS

COVER SHEET

The cover sheet shows both the location and the vicinity map for the North Bend Municipal Airport. A sheet index to the master plan drawings is also provided on this sheet.

AIRPORT LAYOUT PLAN

The airport layout plan depicts the current airport layout and the proposed improvements to the airport for the 20-year planning period. As previously mentioned, the needs defined in the Facility Needs Evaluation (Chapter 4) and the Development Alternatives chapters (Chapters 5 and 6) and the reviews provided by the PAC were the basis for determining the proposed improvements at North Bend Municipal Airport.

One of the primary focuses for future improvements at the airport is the future terminal area. Initially, four separate sites were evaluated for the future terminal building. This was later reduced to three sites, which were evaluated and presented in Chapter 6, Terminal Development Alternatives. The three alternatives, along with cost evaluations, were presented to the PAC on July 12th, 2001. The committee recommended Alternative #2, which places the new terminal building in the location of the existing large hangar. This alternative was then reviewed and accepted by the Port of Coos Bay commission on September 5, 2001. The layout for the terminal area is shown on the airport layout plan and in more detail on the terminal area plan.

A wide variety of other improvements are to occur over the 20-year planning period. During the first five years of the planning period, FAA Facilities is installing a MALSR (Medium intensity Approach Lighting Systems RAIL) on Runway 4, along with RVR (Runway Visual Range Facilities), which provide a measurement of horizontal visibility to pilots, in 2002. It is recommended that PAPI's be installed on Runway 4 and 22, replacing the VASI's on Runway 4. PAPI's are recommended to be installed on Runway 13 also, to complement the PAPI's currently available on Runway 31. REILs are to be installed on Runways 22 and 31. The other major focus for improvements in 2002 revolves around the recent need for increased security measures since the September 11th, 2001 terrorist attacks. The airport plans to install new airport security fencing on the west side of the airport, purchase two new security vehicles and a security radio system, along with installing a photo ID system and access locks. In 2003, the existing terminal will be renovated. It is planned for Runway 31 to have a width adjustment, to reduce the width to 100 feet, since the entire 150-foot width is not required for the B-III operations, with not lower than ¾-mile approach visibility minimums. In conjunction with this width adjustment, the runway and parallel taxiway surface will be rehabilitated and the markings upgraded to non-precision for Runway 31. The lighting for Runway 13/31 will also be reconstructed at this time. The terminal apron will be rehabilitated by replacing panels and sealing cracks and joints in 2003. To meet the requirements for the ultimate CAT I approach on Runway 4, a full-length parallel taxiway is required (AC 150/5300-13, Appendix 16, Change 6). Parallel Taxiway C is planned to be extended to Runway 22, and a connector taxiway is to be built from Taxiway A to Runway 4/22. The taxiways are planned to be built to Group III design standards, per the existing and ultimate airport reference codes (ARC). An Air Traffic Control Tower (ATCT) is also planned to be built in 2003, though a location has not been chosen. Three alternative sites for the ATCT are shown on the airport layout plan. An ATCT siting study will have to be performed and a proposed site chosen. An emergency generator is also planned to be installed in 2003 for the airfield and terminal complex to provide back-up power when power is lost. The final improvement work for 2003 will be work on an environmental assessment for the 4/22 parallel taxiway relocation and safety area improvements, to be constructed in 2004 and 2006, respectively. In 2004, building abatement and demolition is planned for the area in which the new t-hangar is to be constructed. Following the abatement and demolition, the t-hangar is planned to be constructed. General building maintenance on the Port owned building is also planned for 2004. To accommodate the C-III aircraft on Runway 4/22, the remaining portion of the parallel taxiway (from Runway 4 to Runway 13-31) will be relocated in 2004, along with paving improvements to the connector taxiways and infield storm drainage improvements. The existing ARFF building is to be replaced, and buildings in its proposed location abated and demolished in 2005. Continued general building maintenance is planned for 2005. Runway 4/22 surfacing improvements are planned for 2006, along with abandonment of Runway 16-34 and adjacent taxiways. The last item to fully accommodate the C-III aircraft will be safety area improvements to Runway 22 in 2006. General airfield pavement maintenance and building maintenance is also planned to occur during 2006.

The first phase of the terminal construction is planned for the five-year period between 2007 and 2011. Associated building purchase, abatement and demolition will also occur during this time period. Conventional and executive hangar construction is planned for 2007-2011. For the ten-year period, between 2012 and 2021, the second phase of the terminal construction is planned along with reconstruction of the lighting of Runway 4/22. A number of other improvements are planned to be constructed during these two time periods.

Runway visibility minimums, runway protection zones, object free areas, safety areas and other standard airport dimensions are shown in the plan and in the runway data tables. Wind rose's for all weather and IFR wind coverage is also shown on the airport layout plan.

TERMINAL AREA PLAN

The terminal area plan shows the future terminal area construction at a larger scale than the airport layout plan, which gives a clearer picture of the planned improvements. These improvements consist of removing a number of existing buildings and constructing a new terminal building, new executive, conventional and t-hangars, a new ARFF building, a car rental service building, multiple parking lots, some additional airfield pavement and new roadways.

AIRPORT AIRSPACE PLAN

This plan shows the Part 77 Imaginary Surfaces for the ultimate layout of North Bend Municipal Airport with a USGS map as the background. Airport imaginary surfaces consist of five different types of surfaces. The surfaces for North Bend Municipal Airport are as follows:

Primary Surface: A rectangular surface with a width that varies for each runway (centered on the runway centerline) and a length that extends 200 feet beyond each end of the runway. The elevation of the primary surface corresponds to the elevation of the nearest point of the runway centerline. The width of the primary surface is 1000 feet for

Runway 4/22 and 500 feet for Runway 13/31.

Approach Surface: A surface centered on the extended runway centerline, starting at each end of the primary surface, 200 feet beyond each end of the runway at a width equal to that of the primary surface and an elevation equal to that of the end of the runway; extending a horizontal distance of 5,000 feet at a slope of 20:1 for visual approaches (Runway 13, 31 and 22) and 10,000 feet at a slope of 50:1 and 40,000 feet at a slope of 40:1 for precision approaches (Runway 4) to a width of 1500 feet for Runways 13,31 and 22, and a width of 16,000 feet for Runway 4.

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

Horizontal Surface: An elliptical surface at an elevation 150 feet above the established airport elevation created by swinging 10,000-foot radius arcs from the center of each end of the primary surface of Runway 4/22. Tangent lines then connect these arcs. 5,000-foot arcs are also swung from the primary surface of Runway 13/31, but the Runway 4/22 arcs are the defining surface because they create surround the arcs defined by Runway 13/31.

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

It is ideal to keep these surfaces clear of obstructions whenever possible. The Part 77 surfaces are the basis for protection of the airspace around the airport. Obstructions to these surfaces are identified in the Obstruction Data Tables (on sheets 4,5,6,7 and 8), along with the plan to address the described obstructions. Obstructions to the Part 77 surfaces were determined based on a review of the USGS map and information provided by the National Oceanic Atmospheric Administration (NOAA) and the FAA's aeronautical data sheet, which is based on a survey performed in April of 1997.

APPROACH ZONE PROFILES AND RUNWAY PROTECTION ZONE PLANS & PROFILES

This group of drawings provides a larger scale view of the approach surfaces (existing and ultimate), runway protection zones and obstructions to the approach surfaces.

LAND USE PLAN

A land use plan has been developed for the airport and the surrounding area. This plan includes the zoning on and around the airport, future noise contours for 2020, and a table depicting the zoning ordinances that affect or are related to the airport.

Noise contours were created for both the existing (2000) and the ultimate (2020) airport plan using the FAA Integrated Noise Model software program. The approach and take-off patterns of the aircraft and the number of aircraft operations dictate the noise contours. The ultimate noise contours are shown on the land use plan. The two sets of noise contours are shown on Exhibit 8A. These noise contours provide a basis for evaluation of the land use around the airport, which is discussed in greater length in the Off-Airport Land Use section of this chapter.

There are a number of zoning ordinances which involve the airport, which are identified on the land use plan. The City of North Bend has a section in their zoning ordinance that deals strictly with the zoning classification for on-airport land use, which is called the Airport Zone A-Z. The City of North Bend has another zoning ordinance related to the airport, titled the North Bend Airport Zoning Ordinance. This ordinance addresses the Part 77 Imaginary Surfaces and other height and land use restrictions relative to the airport. This ordinance needs to be updated to incorporate the updated Part 77 surfaces as identified by this master plan. The airport must also comply with the requirements of the Coos Bay Estuary Management Plan, which governs the waters of Coos Bay that surround the airport. These land use and zoning ordinances are discussed in more detail later in this chapter.

The airport will need to update the avigation easements for the RPZs. The easements have not been recently updated and need to encompass the appropriate areas.

OFF-AIRPORT LAND USE

The following section addresses the land use related regulations, development conditions and trends on and adjacent to the North Bend Municipal Airport.

LAND USE REGULATIONS

The North Bend Municipal Airport and the adjacent land areas are regulated by the following City and County Comprehensive Plans and Zoning Ordinances.

- City of North Bend Comprehensive Plan
- City of North Bend Zoning Ordinances
- Coos County Comprehensive Plan
- Coos County Zoning Ordinance
- Coos Bay Estuary Management Plan

City of North Bend Comprehensive Plan

The following policies within the Comprehensive Plan provide the overall community framework for the future planning, development and operation of the airport. They include:

- *It shall be the policy of the City to encourage and support the upgrading of existing facilities and additional development of the North Bend Airport.*
- *The City shall cooperate with and support efforts to improve regional transportation systems, including improvement and expansion of the North Bend Airport, ...*

The City also included an implementation strategy to accomplish the policies described:

- *Utilize the North Bend Airport Master Plan and Commercial Airport Siting Element in conjunction with improvements and further development of the North Bend Airport.*

The City has adopted a General Land Use Map as a part of the Comprehensive Plan, which assigned generalized land use designations to the land areas within the City. The airport is primarily designated Public and Semi-Public Facilities, although the land area between Airport Way on the east and Airport Lane on the west is designated Commercial. The northern boundary of the area with this designation is an imaginary line that connects the ends of both of these streets.

With the exception of the area noted, the boundaries of the Public and Semi-Public Facilities designation is Pony Slough and the bay on the east, and north/northwest and on the south as follows:

- California west to Myrtle
- Connecticut west to Madrona
- Colorado for the remainder of the southern boundary

City of North Bend Zoning Ordinance – Airport Zone

The City has adopted a zoning designation that is specific to all of the land contained within the boundaries of the North Bend Municipal Airport. The zone is entitled Airport Zone (AZ), and was enacted by Ordinance No. 1613 on August 19, 1980, and amended by Ordinance No. 1635 on September 22, 1981. The text of the Zone follows:

Section 63. Uses

1) *Uses Permitted Outright. In the A-Z zone the following uses and their accessory uses are permitted outright:*

    1) *Airport and airport related uses.*
    2) *All uses permitted outright and as conditional uses in the Light Industrial District M-L.*

2) *Conditional Uses Permitted. In the A-Z zone the following uses and their accessory uses are permitted when authorized in accordance with Section 70-75:*

    1) *A use permitted outright in the C-G (General Commercial) or R-M (Multi-Family) zone.*
    2) *A use permitted as a conditional use in the C-G or R-M zone.*

3) *Limitations on Use. In the A-Z zone the following limitations on use shall apply:*

    1) *In granting conditional uses, conflicts and potential conflicts between adjacent uses which are ordinarily not allowed in the same zone shall be considered and resolved in granting such conditional uses.*
    2) *Residential uses shall not be permitted within a noise impact area as defined in the Airport Master Plan.*

City of North Bend/North Bend Airport Zoning Ordinance

The City of North Bend has an airport zoning ordinance, which manages the air space over and adjacent to the airport. This ordinance incorporates the height and land use restrictions as per the Federal Air Regulations (FAR) Part 77 Imaginary Airport Surfaces. This ordinance was developed on May 27, 1970. An update to this ordinance was recommended by David Evans and Associates in their May 1997 Master Plan for the airport through the creation of an Airport Overlay Zone. The Airport Overlay Zone would specifically address the Part 77 surfaces (as did the original ordinance), but take into account the updates to these surfaces that have occurred over the past 30 years. This update was never carried out, but it is recommended that this be done, using the Part 77 surfaces presented in this master plan. The Part 77 surfaces consist of the following:

- Approach Surface
- Transitional Surface
- Horizontal Surface
- Conical Surface

The Approach Surface is the surface area which begins 200 feet from the end of the runway. The Approach Surface for the southern approach to Runway 13-31 extends over Virginia Avenue and continues south to the edge of the Horizontal Surface.

The Transitional Surface generally parallels the runway and extends over developed commercial and residential land uses on the west and east sides of the runway. Any construction within the Approach and Transitional Surfaces requires an aeronautical study using application form FAA 7460-1. However, the Airport Manager indicated that a permit is typically necessary only when proposing to build structures in excess of 80 feet.

The Horizontal Surface completely surrounds the airport and restricts the height of any structure to being no more than 164 feet above sea level.

The Conical Surface extends beyond the Horizontal Surface at an increase in elevation of one foot in height for 20 feet of horizontal distance. The surface continues to a point where it reaches Elevation 364 feet and terminates.

The combined area of the Conical and Horizontal Surfaces cover the majority of the City of North Bend.

Coos County Comprehensive Plan

There is no reference to the North Bend Municipal Airport in the Coos County Comprehensive Plan.

Coos County Zoning and Land Development Ordinance Vol. II

Coos County has adopted a Floating Zone titled Airport Surfaces/AS. According to the zone description:

> *The purpose of the Airport Surface Floating Zone is to protect public health, safety and welfare. It is recognized that obstructions to aviation have potential for endangering the lives and property of users of selected airports, and property of occupancy of land in the airport's vicinity; an obstruction may affect future instrument approach minimums; and obstructions may reduce the area available for the landing, take-off and maneuvering of aircraft, thus tending to destroy or impair the utility of the airport and the public investment therein.*

Coos County has not applied this zone to the North Bend Municipal Airport. According to the staff, the County is in the process of amending the zone to establish the AS zone at the airport. This zoning should consist of the airport overlay zone recommended to be established by the City of North Bend, which addresses the updated Part 77 imaginary surfaces.

Coos Bay Estuary Management Plan

Coos Bay adopted an Estuary Management Plan on September 28, 1982, under Ordinance No. 1654. It is a regional plan for the City, County and Port that border Coos Bay, and governs the shoreline around the airport.

LAND DEVELOPMENT CONDITIONS AND TRENDS

- Existing and projected growth trends
- Noise sensitive land uses and locations

The following land use and development conditions have been observed on non-airport related lands adjacent to and near the airport.

Existing and Projected Growth Conditions

The major land use adjacent to the airport facility and its related uses is the Airport Business Park. The park is approximately 115 acres and 40 percent developed. The area includes a variety of uses, including: office, industrial/warehouse, community service, retail/service and one multi-family structure. The major concentrations of employment are at the Bureau of Land Management offices on Airport Lane, and 800 Support on Colorado Avenue east of Lincoln Street. New streets and utilities were recently extended into an undeveloped section of the Business Park. This is the area where new business and industry are expected to locate during the next five to 10 years. Other vacant and under-utilized sites within the Business Park are also being marketed for compatible use development.

The majority of the area south of Colorado Avenue and east to Broadway has been, and is being, developed for single family residential uses. The area that is currently under development is north of Virginia Avenue and west of Arthur.

To the east of Broadway, and primarily south of Virginia Avenue, is North Bend's major shopping area: Pony Village. Several new commercial developments have recently occurred within this area. These include a new Rite-Aid and a Safeway Supermarket, as well as extensive remodeling of the original Pony Village complex. The Pony Village Motel was recently acquired by Ramada, and is undergoing an extensive renovation of the interior and exterior of the buildings. This development is within the Approach Surface of Runway 13-31.

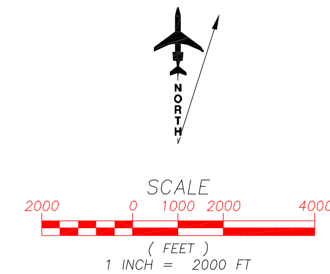
There is an established residential area immediately south of Virginia Avenue, east of Broadway, and west of the Pony Village development. Some of the residences and vacant properties on both sides of Broadway have been converted to office and commercial uses recently, and this trend is expected to continue in the future.

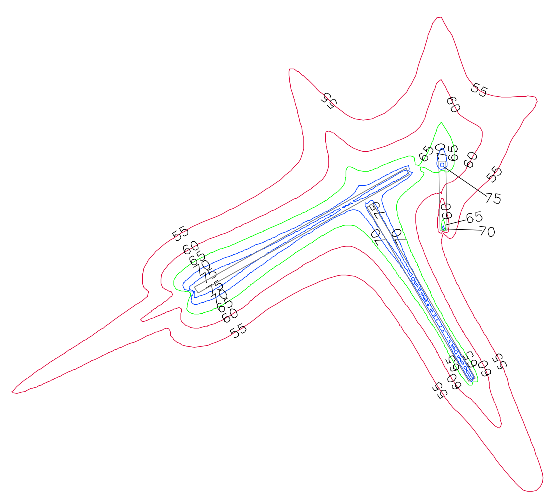
Noise Sensitive Land Uses and Locations

Noise contours were created for both the existing (2000) and the ultimate (2020) airport plan using the FAA Integrated Noise Model software program. The approach and take-off patterns of the aircraft and the number of aircraft operations dictate the noise contours. The ultimate noise contours are shown on the land use plan. The two sets of noise contours are shown on Exhibit 8A. These noise contours provide a basis for evaluation of the land use around the airport.

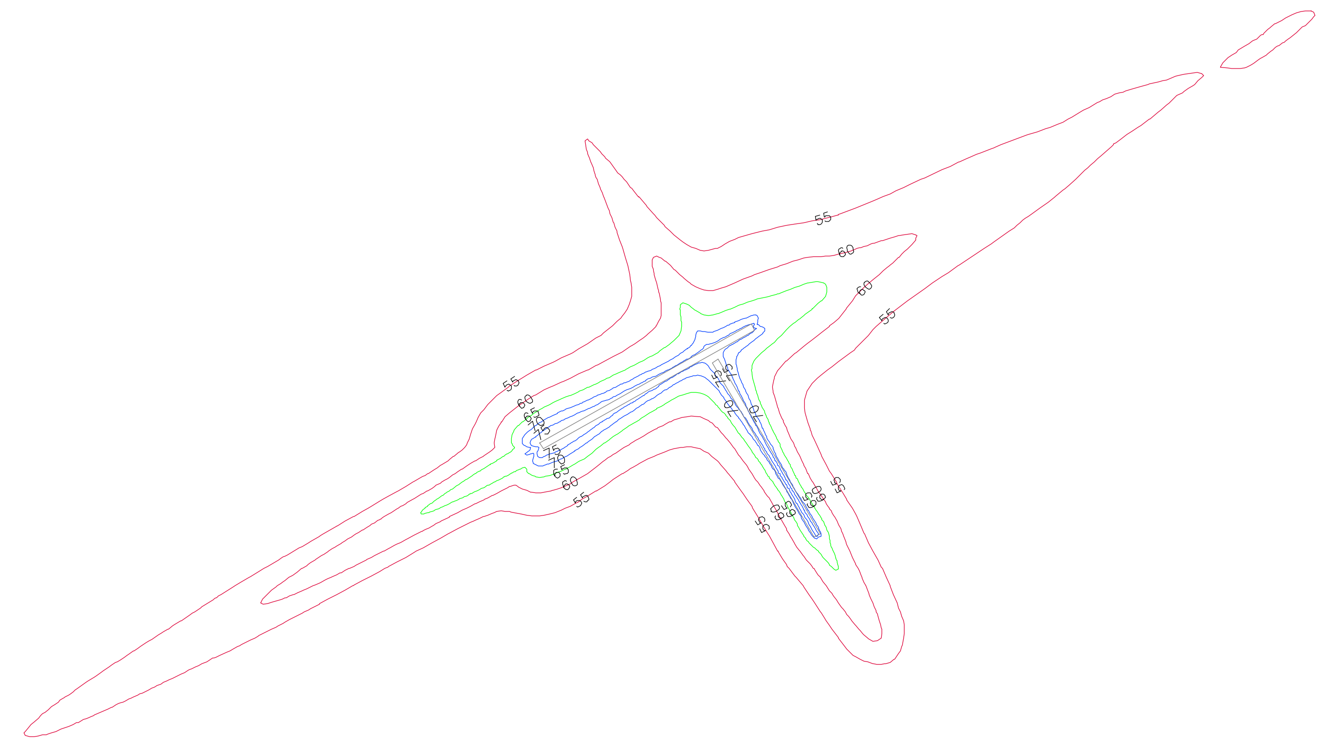
Noise levels are measured in decibels of Day-Night Average Sound Levels or DNL. This measurement is then translated to contours, which depict the areas within the various DNL levels. FAR Part 150, shown in Exhibit 8B, provides guidelines for noise levels around an airport. All areas within the 65 DNL contour are owned by the airport or are over water, with one exception. Beyond the threshold for runway 31, the 65 DNL noise contour overlaps the general commercial and the light manufacturing areas, but per FAR Part 150, it is acceptable to have this type of use within the 65-70 DNL range.

DWG INDEX:
NORTHBENDEXISTING
NORTHBENDFUTURE





EXISTING NOISE CONTOURS–2000



ULTIMATE NOISE CONTOURS–2020

DESIGNED BY: LAM	CHECKED BY: REA
DRAWN BY: JFM	APPROVED BY:
LAST EDIT: 11/01/01	PLOT DATE: 12/03/01

DATE	BY	REV#	REVISION	CK'D	APPR

North Bend Municipal Airport
Operated by OREGON INTERNATIONAL PORT OF COOS BAY

W&H PACIFIC
8405 SW Nimbus Avenue
Beaverton, Oregon 97008-7141
(503)626-0455
(503)526-0775 Fax
whpacific.com
A Member of The IT Group

Coffman Associates
Airport Consultants

PORT OF COOS BAY
NORTH BEND MUNICIPAL AIRPORT
NOISE CONTOURS

NORTH BEND — OREGON

SCALE:	PROJECT NO.	DRAWING FILE NAME:	SHEET
1"=2000'	819142	FIGURE 8-1.DWG	EXHIBIT 8A

0MP11-8B-10/31/01

LAND USE	Yearly Day-Night Average Sound Level (DNL) in Decibels					
	Below 65	65-70	70-75	75-80	80-85	Over 85
RESIDENTIAL						
Residential, other than mobile homes and transient lodgings	Y	N[1]	N[1]	N	N	N
Mobile home parks	Y	N	N	N	N	N
Transient lodgings	Y	N[1]	N[1]	N[1]	N	N
PUBLIC USE						
Schools	Y	N[1]	N[1]	N	N	N
Hospitals and nursing homes	Y	25	30	N	N	N
Churches, auditoriums, and concert halls	Y	25	30	N	N	N
Government services	Y	Y	25	30	N	N
Transportation	Y	Y	Y[2]	Y[3]	Y[4]	Y[4]
Parking	Y	Y	Y[2]	Y[3]	Y[4]	N
COMMERCIAL USE						
Offices, business and professional	Y	Y	25	30	N	N
Wholesale and retail-building materials, hardware and farm equipment	Y	Y	Y[2]	Y[3]	Y[4]	N
Retail trade-general	Y	Y	25	30	N	N
Utilities	Y	Y	Y[2]	Y[3]	Y[4]	N
Communication	Y	Y	25	30	N	N
MANUFACTURING AND PRODUCTION						
Manufacturing, general	Y	Y	Y[2]	Y[3]	Y[4]	N
Photographic and optical	Y	Y	25	30	N	N
Agriculture (except livestock) and forestry	Y	Y[6]	Y[7]	Y[8]	Y[8]	Y[8]
Livestock farming and breeding	Y	Y[6]	Y[7]	N	N	N
Mining and fishing, resource production and extraction	Y	Y	Y	Y	Y	Y
RECREATIONAL						
Outdoor sports arenas and spectator sports	Y	Y[5]	Y[5]	N	N	N
Outdoor music shells, amphitheaters	Y	N	N	N	N	N
Nature exhibits and zoos	Y	Y	N	N	N	N
Amusements, parks, resorts, and camps	Y	Y	Y	N	N	N
Golf courses, riding stables, and water recreation	Y	Y	25	30	N	N

The designations contained in this table do not constitute a Federal determination that any use of land covered by the program is acceptable under Federal, State, or local law. The responsibility for determining the acceptable and permissible land uses and the relationship between specific properties and specific noise contours rests with the local authorities. FAA determinations under Part 150 are not intended to substitute federally determined land uses for those determined to be appropriate by local authorities in response to locally determined needs and values in achieving noise compatible land uses.

See other side for notes and key to table.

North Bend Municipal Airport

Exhibit 8B
LAND USE COMPATIBILITY GUIDELINES

KEY

Y (Yes)	Land Use and related structures compatible without restrictions.
N (No)	Land Use and related structures are not compatible and should be prohibited.
NLR	Noise Level Reduction (outdoor to indoor) to be achieved through incorporation of noise attenuation into the design and construction of the structure.
25, 30, 35	Land Use and related structures generally compatible; measures to achieve NLR of 25, 30, or 35 dB must be incorporated into design and construction of structure.

NOTES

1 Where the community determines that residential or school uses must be allowed, measures to achieve outdoor to indoor Noise Level Reduction (NLR)of at least 25 dB and 30 dB should be incorporated into building codes and be considered in individual approvals. Normal residential construction can be expected to provide a NLR of 20 dB, thus, the reduction requirements are often stated as 5, 10, or 15 dB over standard construction and normally assume mechanical ventilation and closed windows year round. However, the use of NLR criteria will not eliminate outdoor noise problems.

2 Measures to achieve NLR of 25 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas, or where the normal noise level is low.

3 Measures to achieve NLR of 30 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas, or where the normal noise level is low.

4 Measures to achieve NLR of 35 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas, or where the normal noise level is low.

5 Land use compatible provided special sound reinforcement systems are installed.

6 Residential buildings require a NLR of 25.

7 Residential buildings require a NLR of 30.

8 Residential buildings not permitted.

Source: ***F.A.R. Part 150,*** *Appendix A, Table 1.*

North Bend Municipal Airport

North Bend Municipal Airport

AIRPORT LAYOUT PLANS

OREGON INTERNATIONAL PORT OF COOS BAY

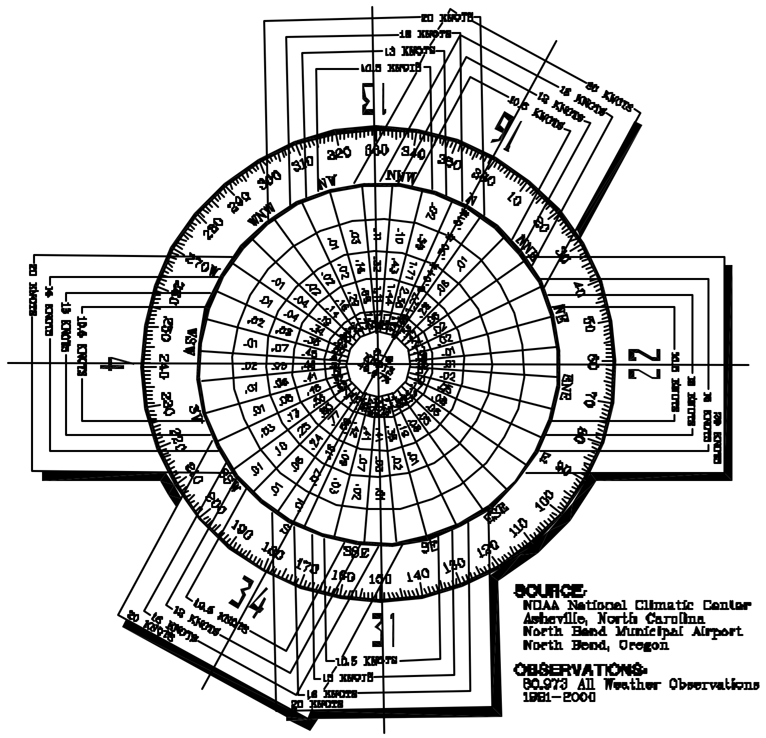
NORTH BEND MUNICIPAL AIRPORT

AIRPORT MASTER PLAN

A.I.P. 3-41-0041-14

OCTOBER 2001

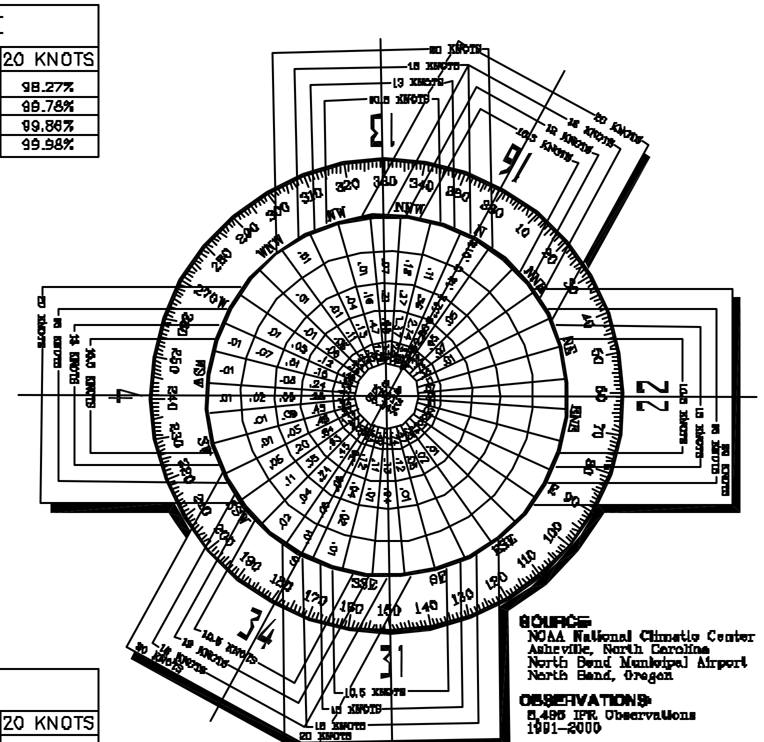
North Bend Municipal Airport
Operated by OREGON INTERNATIONAL PORT OF COOS BAY



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

OBSERVATIONS:
80,973 All Weather Observations
1981–2000

ALL WEATHER WIND COVERAGE				
RUNWAYS	10.5 KNOTS	13 KNOTS	16 KNOTS	20 KNOTS
RUNWAY 4–22	84.42%	89.39%	94.90%	98.27%
RUNWAY 13–31	94.28%	97.04%	99.12%	99.78%
RUNWAY 16–34	96.13%	98.09%	99.49%	99.86%
RUNWAYS 4–22/13–31	98.23%	99.91%	99.86%	99.98%

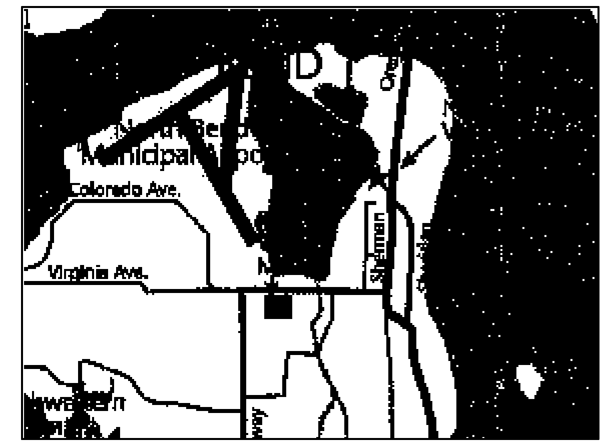


SOURCE:
NOAA National Climatic Center
Asheville, North Carolina
North Bend Municipal Airport
North Bend, Oregon

OBSERVATIONS:
5,496 IFR Observations
1981–2000

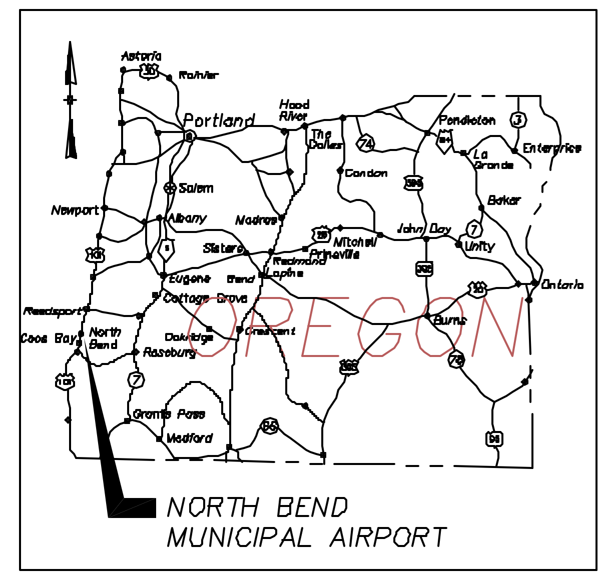
IFR WIND COVERAGE				
RUNWAYS	10.5 KNOTS	13 KNOTS	16 KNOTS	20 KNOTS
RUNWAY 4–22	87.75%	92.58%	97.23%	99.06%
RUNWAY 13–31	95.08%	97.33%	99.07%	99.70%
RUNWAY 16–34	97.64%	98.86%	99.56%	99.80%
RUNWAYS 4–22/13–31	98.44%	99.49%	99.89%	99.99%

VICINITY MAP



SHEET INDEX

LOCATION MAP



Coffman Associates
Airport Consultants

DATE	BY	REV#	REVISION	CK'D	APPR.

"THE PREPARATION OF THESE DOCUMENTS MAY HAVE BEEN SUPPORTED, IN PART THOUGH THE AIRPORT IMPROVEMENT PROGRAM FINANCIAL ASSISTANCE FROM THE FEDERAL AVIATION ADMINISTRATION (PROJECT NUMBER 3-41-0041-14) AS PROVIDED UNDER TITLE 49, UNITED STATES CODE, SECTION 47104. THE CONTENTS DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THESE DOCUMENTS BY THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATE IN ANY DEVELOPMENT DEPICTED HEREIN NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE IN ACCORDANCE WITH APPROPRIATE PUBLIC LAWS."

W&H PACIFIC
A Member of The IE Group
8405 SW Nimbus Avenue
Beaverton, Oregon 97008–7141
(503)626-0455
(503)526-0775 Fax
whpacific.com

DRAWN BY: RAT
CHECKED BY: LAM
APPROVED BY: REA

DRAWING FILE NAME: ANBMCS01.DWG

SHEET 1/9

1

SECTION, TOWNSHIP, RANGE:

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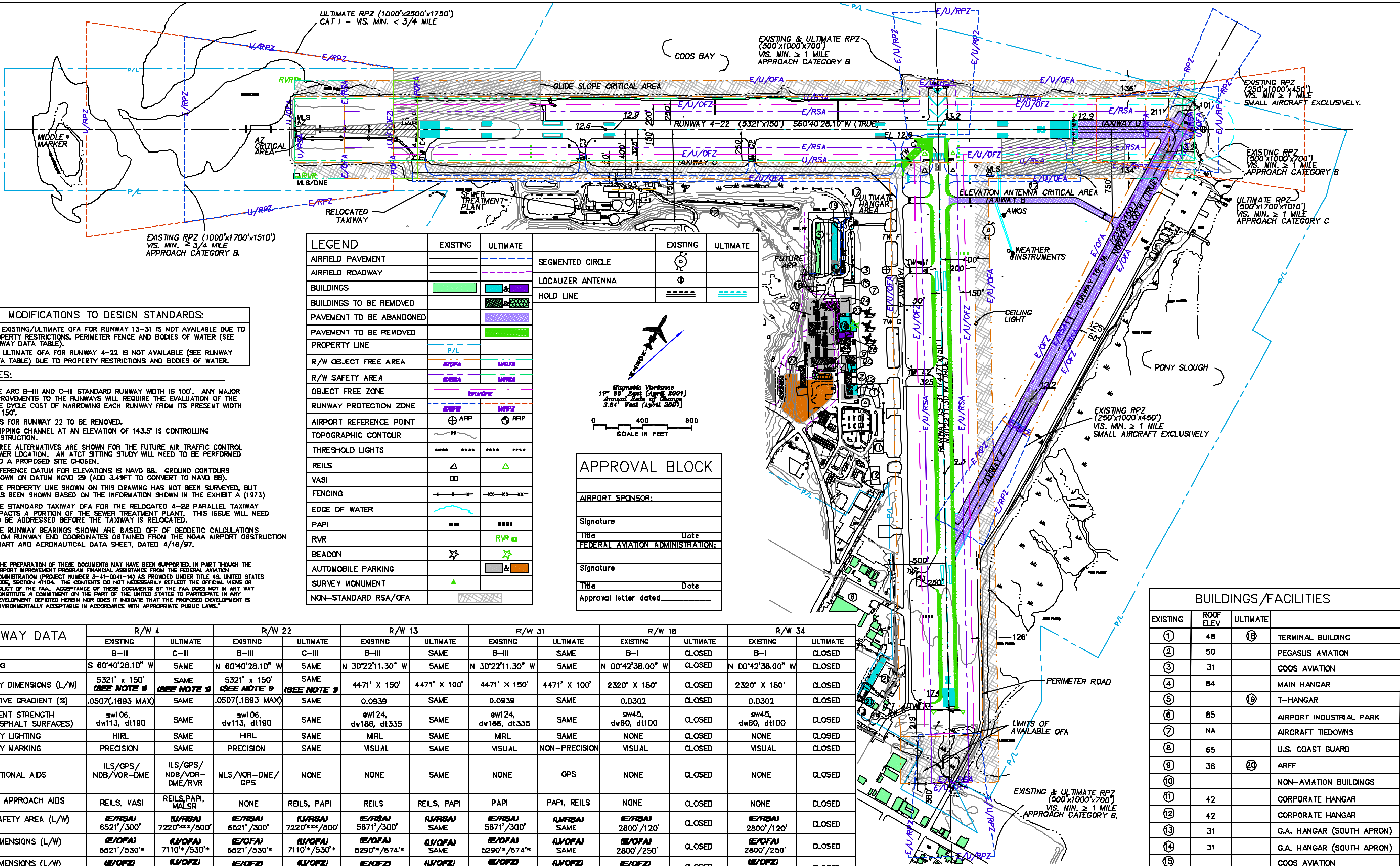
XNBMAN01



LEGEND	EXISTING	ULTIMATE
AIRFIELD PAVEMENT		
AIRFIELD ROADWAY		
BUILDINGS		
BUILDINGS TO BE REMOVED		
PAVEMENT TO BE ABANDONED		
PAVEMENT TO BE REMOVED		
PROPERTY LINE	P/L	
R/W OBJECT FREE AREA	E/OFA	U/OFA
R/W SAFETY AREA	E/RSA	U/RSA
OBJECT FREE ZONE	E/U/OFZ	
RUNWAY PROTECTION ZONE	E/RPZ	U/RPZ
AIRPORT REFERENCE POINT	ARP	ARP
TOPOGRAPHIC CONTOUR		
THRESHOLD LIGHTS		
REILS		
VASI		
FENCING		
EDGE OF WATER		
PAPI		
RVR		RVR
BEACON		
AUTOMOBILE PARKING		
SURVEY MONUMENT		
NON-STANDARD RSA/OFA		

	EXISTING	ULTIMATE
SEGMENTED CIRCLE		
LOCALIZER ANTENNA		
HOLD LINE		

APPROVAL BLOCK

AIRPORT SPONSOR:

Signature

Title Date

FEDERAL AVIATION ADMINISTRATION:

Signature

Title Date

Approval letter dated__________

MODIFICATIONS TO DESIGN STANDARDS:

1. THE EXISTING/ULTIMATE OFA FOR RUNWAY 13-31 IS NOT AVAILABLE DUE TO PROPERTY RESTRICTIONS. PERIMETER FENCE AND BODIES OF WATER (SEE RUNWAY DATA TABLE).
2. THE ULTIMATE OFA FOR RUNWAY 4-22 IS NOT AVAILABLE (SEE RUNWAY DATA TABLE) DUE TO PROPERTY RESTRICTIONS AND BODIES OF WATER.

NOTES:

1. THE ARC B-III AND C-II STANDARD RUNWAY WIDTH IS 100'. ANY MAJOR IMPROVEMENTS TO THE RUNWAYS WILL REQUIRE THE EVALUATION OF THE LIFE CYCLE COST OF NARROWING EACH RUNWAY FROM ITS PRESENT WIDTH OF 150'.
2. MLS FOR RUNWAY 22 TO BE REMOVED.
3. SHIPPING CHANNEL AT AN ELEVATION OF 143.5' IS CONTROLLING OBSTRUCTION.
4. THREE ALTERNATIVES ARE SHOWN FOR THE FUTURE AIR TRAFFIC CONTROL TOWER LOCATION. AN ATCT SITTING STUDY WILL NEED TO BE PERFORMED AND A PROPOSED SITE CHOSEN.
5. REFERENCE DATUM FOR ELEVATIONS IS NAVD 88. GROUND CONTOURS SHOWN ON DATUM NGVD 29 (ADD 3.49FT TO CONVERT TO NAVD 88).
6. THE PROPERTY LINE SHOWN ON THIS DRAWING HAS NOT BEEN SURVEYED, BUT HAS BEEN SHOWN BASED ON THE INFORMATION SHOWN IN THE EXHIBIT A (1973)
7. THE STANDARD TAXIWAY OFA FOR THE RELOCATED 4-22 PARALLEL TAXIWAY IMPACTS A PORTION OF THE SEWER TREATMENT PLANT. THIS ISSUE WILL NEED TO BE ADDRESSED BEFORE THE TAXIWAY IS RELOCATED.
8. THE RUNWAY BEARINGS SHOWN ARE BASED OFF OF GEODETIC CALCULATIONS FROM RUNWAY END COORDINATES OBTAINED FROM THE NOAA AIRPORT OBSTRUCTION CHART AND AERONAUTICAL DATA SHEET, DATED 4/18/97.

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RUNWAY DATA	R/W 4		R/W 22		R/W 13		R/W 31		R/W 16		R/W 34	
	EXISTING	ULTIMATE	EXISTING	ULTIMATE	EXISTING	ULTIMATE	EXISTING	ULTIMATE	EXISTING	ULTIMATE	EXISTING	ULTIMATE
ARC	B-II	C-II	B-III	C-III	B-III	SAME	B-III	SAME	B-I	CLOSED	B-I	CLOSED
BEARING	S 60°40'28.10" W	SAME	N 60°40'28.10" W	SAME	N 30°22'11.30" W	SAME	N 30°22'11.30" W	SAME	N 00°42'38.00" W	CLOSED	N 00°42'38.00" W	CLOSED
RUNWAY DIMENSIONS (L/W)	5321' x 150' (SEE NOTE 1)	SAME (SEE NOTE 1)	5321' x 150' (SEE NOTE 1)	SAME (SEE NOTE 1)	4471' X 150'	4471' X 100'	4471' X 150'	4471' X 100'	2320' X 150'	CLOSED	2320' X 150'	CLOSED
EFFECTIVE GRADIENT (%)	.0507(.1693 MAX)	SAME	.0507(.1693 MAX)	SAME	0.0939	SAME	0.0939	SAME	0.0302	CLOSED	0.0302	CLOSED
PAVEMENT STRENGTH (ALL ASPHALT SURFACES)	sw106, dw113, dt190	SAME	sw106, dw113, dt190	SAME	sw124, dw186, dt335	SAME	sw124, dw186, dt335	SAME	sw45, dw80, dt100	CLOSED	sw45, dw80, dt100	CLOSED
RUNWAY LIGHTING	HIRL	SAME	HIRL	SAME	MIRL	SAME	MIRL	SAME	NONE	CLOSED	NONE	CLOSED
RUNWAY MARKING	PRECISION	SAME	PRECISION	SAME	VISUAL	SAME	VISUAL	NON-PRECISION	VISUAL	CLOSED	VISUAL	CLOSED
NAVIGATIONAL AIDS	ILS/GPS/ NDB/VOR-DME	ILS/GPS/ NDB/VOR-DME/RVR	MLS/VOR-DME/ GPS	NONE	NONE	SAME	NONE	GPS	NONE	CLOSED	NONE	CLOSED
VISUAL APPROACH AIDS	REILS, VASI	REILS, PAPI, MALSR	NONE	REILS, PAPI	REILS	REILS, PAPI	PAPI	PAPI, REILS	NONE	CLOSED	NONE	CLOSED
RSA SAFETY AREA (L/W)	(E/RSA) 6521'/300'	(U/RSA) 7220'***/500'	(E/RSA) 6521'/300'	(U/RSA) 7220'***/500'	(E/RSA) 5671'/300'	(U/RSA) SAME	(E/RSA) 5671'/300'	(U/RSA) SAME	(E/RSA) 2800'/120'	CLOSED	(E/RSA) 2800'/120'	CLOSED
OFA DIMENSIONS (L/W)	(E/OFA) 6521'/630'*	(U/OFA) 7110'+/530'+	(E/OFA) 6521'/630'*	(U/OFA) 7110'+/530'+	(E/OFA) 5290'*/674'*	(U/OFA) SAME	(E/OFA) 5290'*/674'*	(U/OFA) SAME	(E/OFA) 2800'/250'	CLOSED	(E/OFA) 2800'/250'	CLOSED
OFZ DIMENSIONS (L/W)	(E/OFZ) 5721'/400'	(U/OFZ) SAME	(E/OFZ) 5721'/400'	(U/OFZ) SAME	(E/OFZ) 4871'/400'	(U/OFZ) SAME	(E/OFZ) 4871'/400'	(U/OFZ) SAME	(E/OFZ) 2720'/250'	CLOSED	(E/OFZ) 2720'/250'	CLOSED
TAXIWAY LIGHTING	MITL	SAME	MITL	SAME	MITL	SAME	MITL	SAME	NONE	CLOSED	NONE	CLOSED
APPROACH TYPE	PRECISION	SAME	NON-PRECISION	VISUAL	VISUAL	SAME	VISUAL	VISUAL-GPS	VISUAL	CLOSED	VISUAL	CLOSED
APPROACH SLOPE	25:1 (SEE NOTE 3)	SAME	8:1 (SEE NOTE 3)	SAME	11:1 (SEE NOTE 4)	SAME	20:1	SAME	6:1 (SEE NOTE 3)	CLOSED	20:1	CLOSED
RUNWAY END COORDINATES NAD 83	N 43°24'53.01" W 124°15'38.26"		N 43°25'18.74" W 124°14'35.41"		N 43°25'11.41" W 124°14'46.57"		N 43°24'33.31" W 124°14'15.94"		N 43°25'20.92" W 124°14'25.11"	CLOSED	N 43°24'58.00" W 124°14'24.72"	CLOSED
DECLARED DISTANCES: TORA	5321'**	SAME	5321'**	SAME	4471'**	SAME	4471'**	SAME	2320'	CLOSED	2320'	CLOSED
DECLARED DISTANCES: TODA	5321'**	SAME	5321'**	SAME	4471'**	SAME	4471'**	SAME	2320'	CLOSED	2320'	CLOSED
DECLARED DISTANCES: ASDA	5321'**	SAME	5321'**	SAME	4471'**	SAME	4471'**	SAME	2320'	CLOSED	2320'	CLOSED
DECLARED DISTANCES: LDA	5321'**	SAME	5321'**	SAME	4471'**	SAME	4471'**	SAME	2320'	CLOSED	2320'	CLOSED
RPZ DIMENSIONS W^1	1000'	1000'	500'	500'	500'	SAME	500'	SAME	250'	CLOSED	250'	CLOSED
RPZ DIMENSIONS L	1700'	2500'	1000'	1700'	1000'	SAME	1000'	SAME	1000'	CLOSED	1000'	CLOSED
RPZ DIMENSIONS W^2	1510'	1750'	700'	1010'	700'	SAME	700'	SAME	450'	CLOSED	450'	CLOSED

AIRPORT DATA	EXISTING	ULTIMATE
AIRPORT ELEVATION	17.1'	SAME
AIRPORT REFERENCE POINT (ARP) NAD 83	N 43°25'02" W 124°14'46"	N 43°24'60" W 124°14'51"
MEAN MAXIMUM TEMPERATURE HOTTEST MONTH	67.1°F	SAME
AIRPORT ROLE	PRIMARY	SAME
NAVIGATIONAL AIDS	ILS/MLS/GPS VOR-DME/NDB	ILS/GPS RVR/MALSR VOR-DME/NDB
WEATHER EQUIPMENT	AWOS	SAME
AIRPORT REFERENCE CODE	B-III	C-III
CRITICAL AIRCRAFT	DASH 8-200	Q400
NPIAS ROLE	PR	SAME

BUILDINGS/FACILITIES			
EXISTING	ROOF ELEV	ULTIMATE	
1	48	18	TERMINAL BUILDING
2	50		PEGASUS AVIATION
3	31		COOS AVIATION
4	84		MAIN HANGAR
5		19	T-HANGAR
6	85		AIRPORT INDUSTRIAL PARK
7	NA		AIRCRAFT TIEDOWNS
8	65		U.S. COAST GUARD
9	38	20	ARFF
10			NON-AVIATION BUILDINGS
11	42		CORPORATE HANGAR
12	42		CORPORATE HANGAR
13	31		G.A. HANGAR (SOUTH APRON)
14	31		G.A. HANGAR (SOUTH APRON)
15			COOS AVIATION
16			AIRPORT MAINTENANCE
		17	AIR TRAFFIC CONTROL TOWER
		21	EXECUTIVE HANGER
		22	CONVENTIONAL HANGAR
		23	CAR RENTAL SERVICE BUILDING
		24	CAR RENTAL SERVICE PARKING
		25	EMPLOYEE PARKING
		26	FUEL FARM EXPANSION
		27	LONG TERM PARKING
		28	SHORT TERM PARKING

5405 SW Nimbus Avenue
Beaverton, Oregon 97008-7141
(503)626-0455
(503)526-0775 Fax
whpacific.com

PORT OF COOS BAY
NORTH BEND MUNICIPAL AIRPORT
MASTER PLAN
AIRPORT LAYOUT PLAN

NORTH BEND OREGON

SCALE: 1"=400'

PROJECT NO. 819142

DRAWING FILE NAME: ANBMLP01

Coffman Associates Airport Consultants

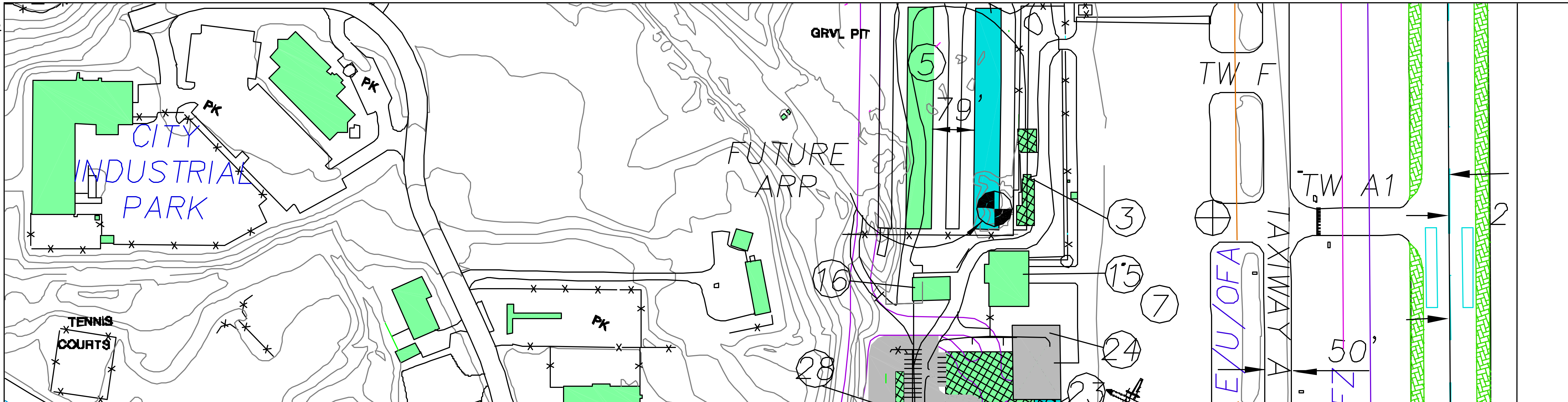
DESIGNED BY: LAM CHECKED BY:
DRAWN BY: RAT APPROVED BY: REA
LAST EDIT: 07/10/02 PLOT DATE: 11/05/02

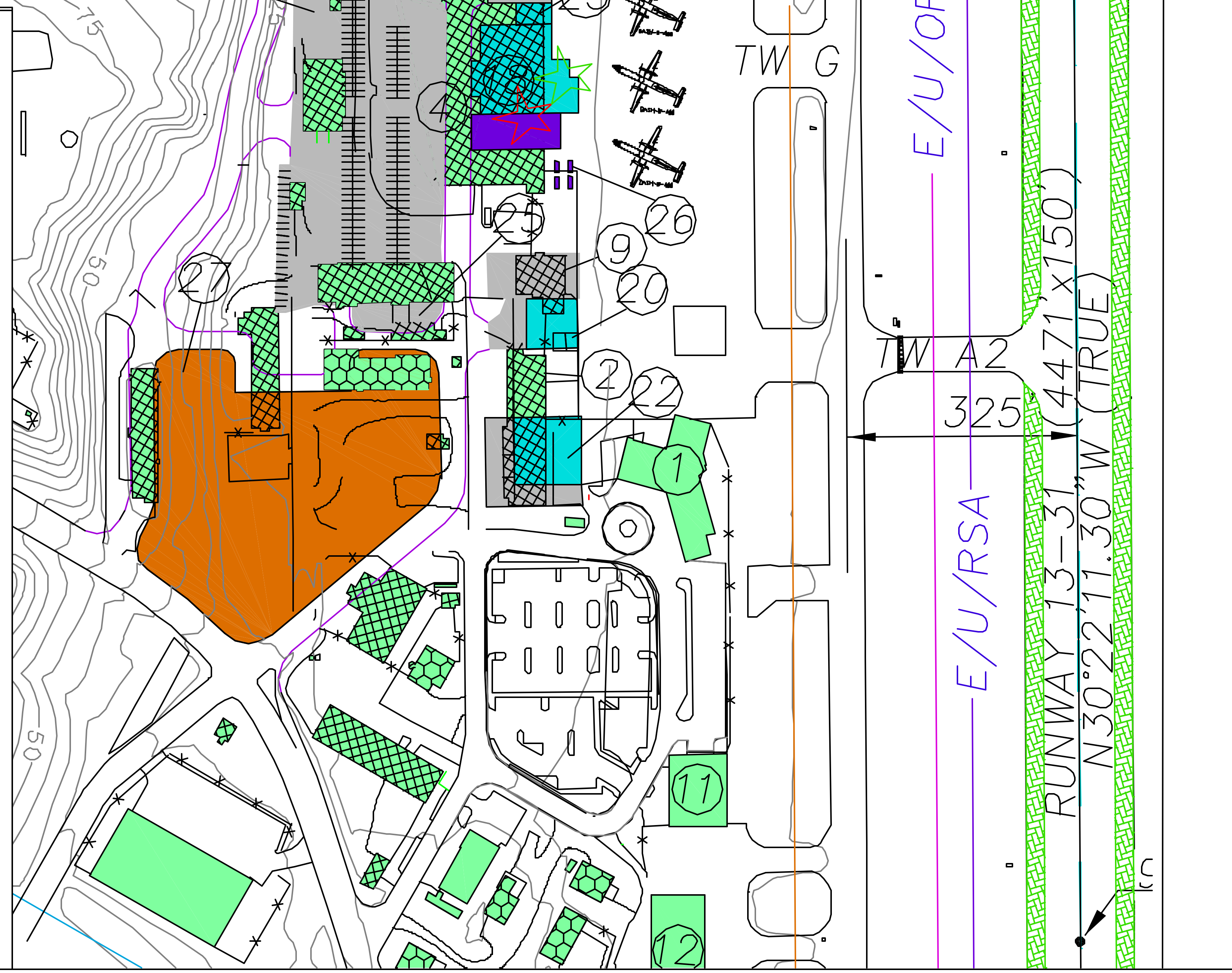
DATE	BY	REV#	REVISION	CK'D	APPR.

SHEET 2/9
2

OFFICE: SEATTLE / SYSTEM: ORBMERRIT / USER: CBONTEMPO

DWG INDEX:





NOTES:

1. THE RUNWAY BEARINGS SHOWN ARE BASED OFF OF GEODETIC CALCULATIONS FROM RUNWAY END COORDINATES OBTAINED FROM THE NOAA AIRPORT OBSTRUCTION CHART AND AERONAUTICAL DATA SHEET, DATED 4/18/97.

SCALE

100 0 50 100 200

(FEET)
1 INCH = 100 FT

LEGEND	EXISTING	ULTIMATE
AIRFIELD PAVEMENT		
AIRFIELD ROADWAY		
BUILDINGS		&
BUILDINGS TO BE REMOVED		&
PAVEMENT TO BE ABANDONED		
PAVEMENT TO BE REMOVED		
PROPERTY LINE	P/L	
R/W OBJECT FREE AREA	E/OFA	U/OFA
R/W SAFETY AREA	E/RSA	U/RSA
OBJECT FREE ZONE	E/U/OFZ	
RUNWAY PROTECTION ZONE	E/RPZ	U/RPZ
AIRPORT REFERENCE POINT	ARP	ARP
TOPOGRAPHIC CONTOUR	50	
THRESHOLD LIGHTS		
REILS		
VASI		
FENCING		
EDGE OF WATER		
PAPI		
RVR		RVR
BEACON		
AUTOMOBILE PARKING		&
SURVEY MONUMENT		
NON-STANDARD RSA/OFA		
SEGMENTED CIRCLE		
LOCALIZER ANTENNA		
HOLD LINE		

TERMINAL CONSTRUCTION LEGEND	PHASE 1	PHASE 2
ULTIMATE BUILDINGS		
BUILDINGS TO BE REMOVED		
AUTOMOBILE PARKING		
APRON PVMT		

BUILDINGS/FACILITIES			
EXISTING	ROOF ELEV	ULTIMATE	
1	48	18	TERMINAL BUILDING
2	80		PEGASUS AVIATION
3	31		COOS AVIATION
4	84		MAIN HANGAR
5		19	T-HANGAR
7	NA		AIRCRAFT TIEDOWNS
9	38	20	ARFF
11	42		CORPORATE HANGAR
12	42		CORPORATE HANGAR
15			COOS AVIATION
16			AIRPORT MAINTENANCE
		17	AIR TRAFFIC CONTROL TOWER
		21	EXECUTIVE HANGER
		22	CONVENTIONAL HANGAR
		23	CAR RENTAL SERVICE BUILDING
		24	CAR RENTAL SERVICE PARKING
		25	EMPLOYEE PARKING
		26	FUEL FARM STATION
		27	LONG TERM PARKING
		28	SHORT TERM PARKING

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A Member of the JF Group

PORT OF COOS BAY
NORTH BEND MUNICIPAL AIRPORT
TERMINAL AREA PLAN

NORTH BEND OREGON

SCALE: 1"=100'

PROJECT NO. 819142

DRAWING FILE NAME: ANBMTA01.DWG

Coffman Associates Airport Consultants

DESIGNED BY: LAM	CHECKED BY:
DRAWN BY: RAT	APPROVED BY: REA
LAST EDIT: 7/10/02	PLOT DATE: 11/05/02

DATE	BY	REV#	REVISION	CK'D	APPR.

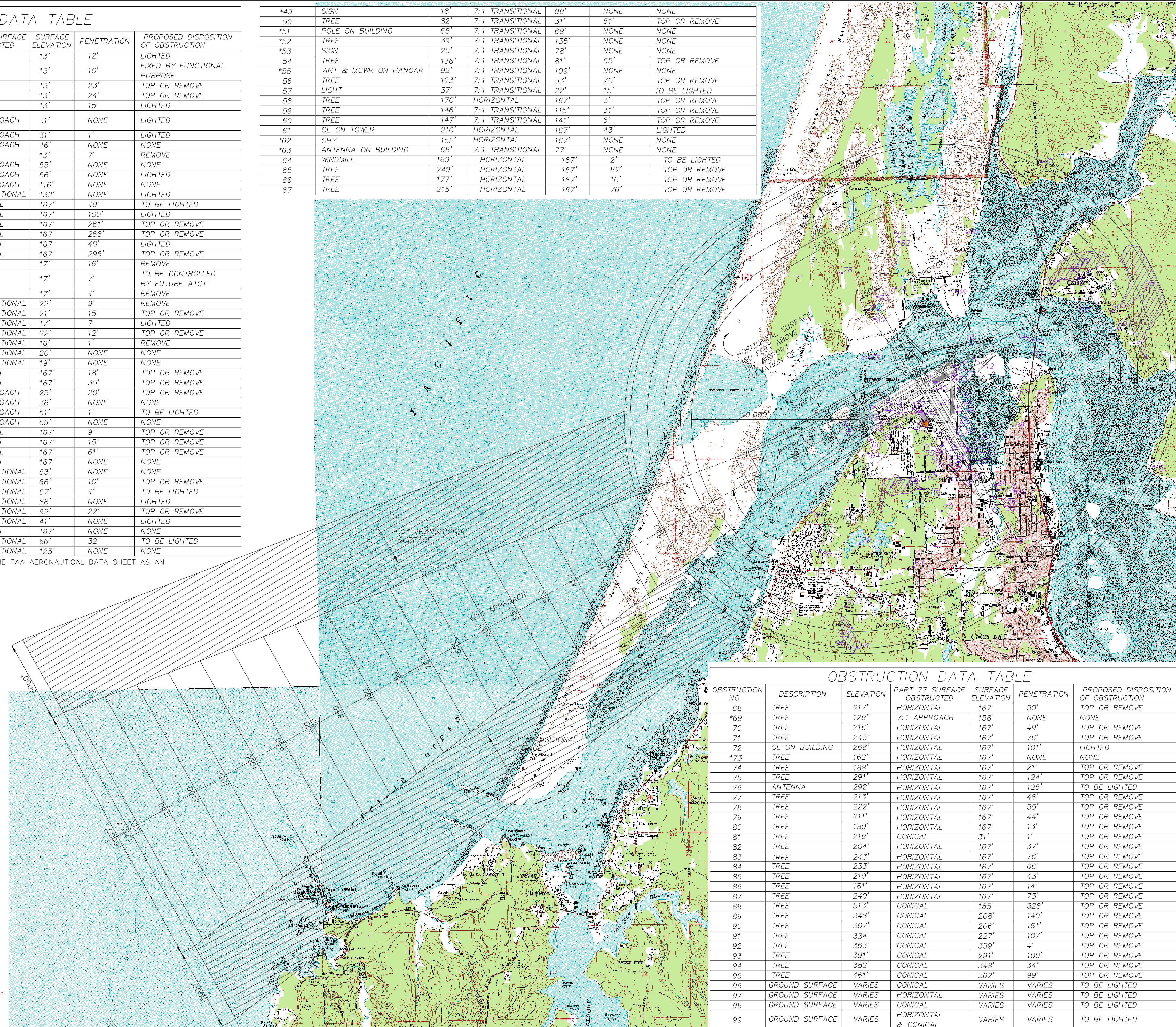
SHEET 3 3/9

DWG INDEX:
XNBMAM01
XNBMAS01
XNBMRAS1

OBSTRUCTION DATA TABLE

OBSTRUCTION NO.	DESCRIPTION	ELEVATION	PART 77 SURFACE OBSTRUCTED	SURFACE ELEVATION	PENETRATION	PROPOSED DISPOSITION OF OBSTRUCTION
1	ROD ON OL POLE	35'	PRIMARY	13'	12'	LIGHTED
2	MLSEL	23'	PRIMARY	13'	10'	FIXED BY FUNCTIONAL PURPOSE
3	TREE	45'	PRIMARY	13'	23'	TOP OR REMOVE
4	TREE	46'	PRIMARY	13'	24'	TOP OR REMOVE
5	ROD ON OL GLIDESLOPE	38'	PRIMARY	13'	15'	LIGHTED
*6	ROD ON OL BUILDING AT MLSAZ	28'	50:1 APPROACH	31'	NONE	LIGHTED
7	OL ON DME	32'	50:1 APPROACH	31'	1'	LIGHTED
*8	FENCE	16'	20:1 APPROACH	46'	NONE	NONE
9	BUSH	20'	PRIMARY	13'	7'	REMOVE
*10	ROD ON BUILDING	31'	20:1 APPROACH	55'	NONE	NONE
*11	OL ON LOCALIZER	20'	20:1 APPROACH	56'	NONE	LIGHTED
*12	BRIDGE	53'	20:1 APPROACH	116'	NONE	NONE
*13	OL ON BRIDGE	93'	7:1 TRANSITIONAL	132'	NONE	LIGHTED
14	TRANSMISION TOWER	216'	HORIZONTAL	167'	49'	TO BE LIGHTED
15	OL ON BUILDING	267'	HORIZONTAL	167'	100'	LIGHTED
16	TREE	428'	HORIZONTAL	167'	261'	TOP OR REMOVE
17	TREE	435'	HORIZONTAL	167'	268'	TOP OR REMOVE
18	OL ON TOWER	207'	HORIZONTAL	167'	40'	LIGHTED
19	TREE	463'	HORIZONTAL	167'	296'	TOP OR REMOVE
20	BUSH	33'	PRIMARY	17'	16'	REMOVE
21	ROAD	24'	PRIMARY	17'	7'	TO BE CONTROLLED BY FUTURE ATCT
22	FENCE	21'	PRIMARY	17'	4'	REMOVE
23	BUSH	31'	7:1 TRANSITIONAL	22'	9'	REMOVE
24	TREE	37'	7:1 TRANSITIONAL	21'	15'	TOP OR REMOVE
25	OL ON WSK	24'	7:1 TRANSITIONAL	17'	7'	LIGHTED
26	TREE	34'	7:1 TRANSITIONAL	22'	12'	TOP OR REMOVE
27	FENCE	17'	7:1 TRANSITIONAL	16'	1'	REMOVE
*28	FENCE	16'	7:1 TRANSITIONAL	20'	NONE	NONE
*29	CLOM	15'	7:1 TRANSITIONAL	19'	NONE	NONE
30	TREE	185'	HORIZONTAL	167'	18'	TOP OR REMOVE
31	TREE	202'	HORIZONTAL	167'	35'	TOP OR REMOVE
32	TREE	45'	20:1 APPROACH	25'	20'	TOP OR REMOVE
*33	TREE	38	20:1 APPROACH	38'	NONE	NONE
34	POLE	52'	20:1 APPROACH	51'	1'	TO BE LIGHTED
*35	POLE	57'	20:1 APPROACH	59'	NONE	NONE
36	TREE	176'	HORIZONTAL	167'	9'	TOP OR REMOVE
37	TREE	182'	HORIZONTAL	167'	15'	TOP OR REMOVE
38	TREE	228'	HORIZONTAL	167'	61'	TOP OR REMOVE
*39	STK	130'	HORIZONTAL	167'	NONE	NONE
*40	LIGHT	48'	7:1 TRANSITIONAL	53'	NONE	NONE
41	TREE	76'	7:1 TRANSITIONAL	66'	10'	TOP OR REMOVE
42	LIGHT	61'	7:1 TRANSITIONAL	57'	4'	TO BE LIGHTED
*43	AIRPORT BEACON	88'	7:1 TRANSITIONAL	88'	NONE	LIGHTED
44	TREE	114'	7:1 TRANSITIONAL	92'	22'	TOP OR REMOVE
*45	ROD ON OL AMOM	35'	7:1 TRANSITIONAL	41'	NONE	LIGHTED
*46	ANTENNA ON RTR TOWER	147'	HORIZONTAL	167'	NONE	NONE
47	BUILDING	98'	7:1 TRANSITIONAL	66'	32'	TO BE LIGHTED
*48	TREE	44'	7:1 TRANSITIONAL	125'	NONE	NONE
*49	SIGN	18'	7:1 TRANSITIONAL	99'	NONE	NONE
50	TREE	82'	7:1 TRANSITIONAL	31'	51'	TOP OR REMOVE
*51	POLE ON BUILDING	68'	7:1 TRANSITIONAL	69'	NONE	NONE
*52	TREE	39'	7:1 TRANSITIONAL	135'	NONE	NONE
*53	SIGN	20'	7:1 TRANSITIONAL	78'	NONE	NONE
54	TREE	136'	7:1 TRANSITIONAL	81'	55'	TOP OR REMOVE
*55	ANT & MCWR ON HANGAR	92'	7:1 TRANSITIONAL	109'	NONE	NONE
56	TREE	123'	7:1 TRANSITIONAL	53'	70'	TOP OR REMOVE
57	LIGHT	37'	7:1 TRANSITIONAL	22'	15'	TO BE LIGHTED
58	TREE	170'	HORIZONTAL	167'	3'	TOP OR REMOVE
59	TREE	146'	7:1 TRANSITIONAL	115'	31'	TOP OR REMOVE
60	TREE	147'	7:1 TRANSITIONAL	141'	6'	TOP OR REMOVE
61	OL ON TOWER	210'	HORIZONTAL	167'	43'	LIGHTED
*62	CHY	152'	HORIZONTAL	167'	NONE	NONE
*63	ANTENNA ON BUILDING	68'	7:1 TRANSITIONAL	77'	NONE	NONE
64	WINDMILL	169'	HORIZONTAL	167'	2'	TO BE LIGHTED
65	TREE	249'	HORIZONTAL	167'	82'	TOP OR REMOVE
66	TREE	177'	HORIZONTAL	167'	10'	TOP OR REMOVE
67	TREE	215'	HORIZONTAL	167'	76'	TOP OR REMOVE
68	TREE	217'	HORIZONTAL	167'	50'	TOP OR REMOVE
*69	TREE	129'	7:1 APPROACH	158'	NONE	NONE
70	TREE	216'	HORIZONTAL	167'	49'	TOP OR REMOVE
71	TREE	243'	HORIZONTAL	167'	76'	TOP OR REMOVE
72	OL ON BUILDING	268'	HORIZONTAL	167'	101'	LIGHTED
*73	TREE	162'	HORIZONTAL	167'	NONE	NONE
74	TREE	188'	HORIZONTAL	167'	21'	TOP OR REMOVE
75	TREE	291'	HORIZONTAL	167'	124'	TOP OR REMOVE
76	ANTENNA	292'	HORIZONTAL	167'	125'	TO BE LIGHTED
77	TREE	213'	HORIZONTAL	167'	46'	TOP OR REMOVE
78	TREE	222'	HORIZONTAL	167'	55'	TOP OR REMOVE
79	TREE	211'	HORIZONTAL	167'	44'	TOP OR REMOVE
80	TREE	180'	HORIZONTAL	167'	13'	TOP OR REMOVE
81	TREE	219'	CONICAL	31'	1'	TOP OR REMOVE
82	TREE	204'	HORIZONTAL	167'	37'	TOP OR REMOVE
83	TREE	243'	HORIZONTAL	167'	76'	TOP OR REMOVE
84	TREE	233'	HORIZONTAL	167'	66'	TOP OR REMOVE
85	TREE	210'	HORIZONTAL	167'	43'	TOP OR REMOVE
86	TREE	181'	HORIZONTAL	167'	14'	TOP OR REMOVE
87	TREE	240'	HORIZONTAL	167'	73'	TOP OR REMOVE
88	TREE	513'	CONICAL	185'	328'	TOP OR REMOVE
89	TREE	348'	CONICAL	208'	140'	TOP OR REMOVE
90	TREE	367'	CONICAL	206'	161'	TOP OR REMOVE
91	TREE	334'	CONICAL	227'	107'	TOP OR REMOVE
92	TREE	363'	CONICAL	359'	4'	TOP OR REMOVE
93	TREE	391'	CONICAL	291'	100'	TOP OR REMOVE
94	TREE	382'	CONICAL	348'	34'	TOP OR REMOVE
95	TREE	461'	CONICAL	362'	99'	TOP OR REMOVE
96	GROUND SURFACE	VARIES	CONICAL	VARIES	VARIES	TO BE LIGHTED
97	GROUND SURFACE	VARIES	HORIZONTAL	VARIES	VARIES	TO BE LIGHTED
98	GROUND SURFACE	VARIES	CONICAL	VARIES	VARIES	TO BE LIGHTED
99	GROUND SURFACE	VARIES	HORIZONTAL & CONICAL	VARIES	VARIES	TO BE LIGHTED

*NOT AN OBSTRUCTION. LISTED BECAUSE OF ITS PRESENCE ON THE FAA AERONAUTICAL DATA SHEET AS AN EXISTING OBSTRUCTION.



NOTES:

1. OBSTRUCTIONS LISTED INFORMATION WAS OBTAINED FROM NOAA AIRPORT OBSTRUCTION CHART AND AERONAUTICAL DATA SHEET, USGS QUAD MAPS, AND AIRPORT MANAGEMENT. NO SURVEY WAS PERFORMED.
2. A GROWTH ALLOWANCE WAS NOT INCORPORATED INTO THE OBSTRUCTION REVIEW.
3. THE PRECISION APPROACH TO RUNWAY 22 FOR THE MLS IS NOT INCORPORATED BECAUSE IT HAS BEEN DECOMMISSIONED AND THE 34:1 APPROACH PROTECTS MORE AIRSPACE THAN THE CURRENT MLS APPROACH.

LEGEND:

1 OBSTRUCTION

1 GROUP OR MULTIPLE OBSTRUCTION

NORTH

SCALE

10 0 5 10 20

(FEET)

1 INCH = 10 FT

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PORT OF COOS BAY
NORTH BEND MUNICIPAL AIRPORT
AIRPORT AIRSPACE PLAN

NORTH BEND OREGON

SCALE: 1"=10'

PROJECT NO. 819142

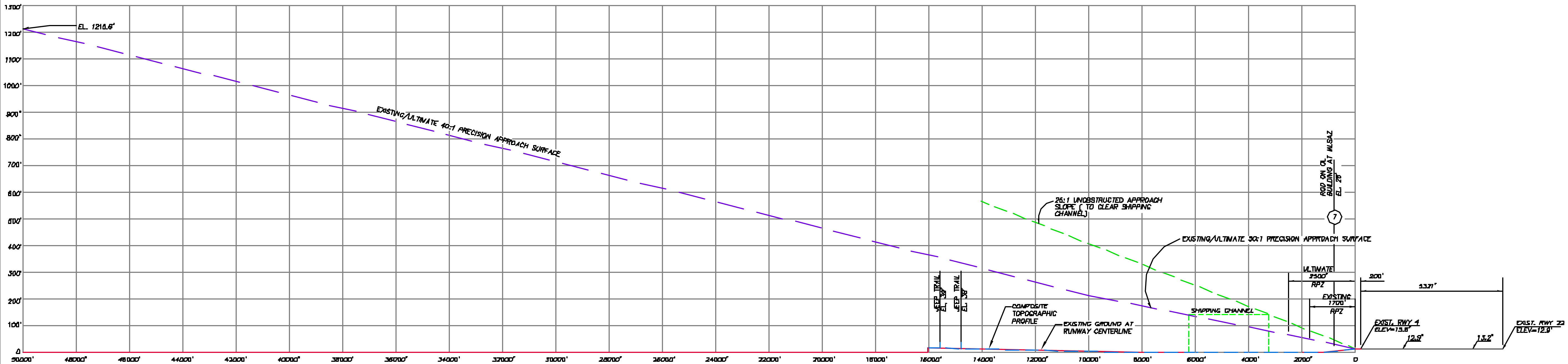
DRAWING FILE NAME: ANBMAS01

Coffman Associates
Airport Consultants

DESIGNED BY: LAM CHECKED BY: MIN
DRAWN BY: RAT APPROVED BY:
LAST EDIT: 07/10/02 PLOT DATE: 11/05/02

DATE	BY	REV#	REVISION	CK'D	APPR.

DWG INDEX:



RUNWAY 4 APPROACH ZONE PROFILE

SCALE: HORIZONTAL 1"=2000'
VERTICAL 1"=200'

SCALE
2000 0 1000 2000 4000
(FEET)
1 INCH = 2000 FT

NOTES:

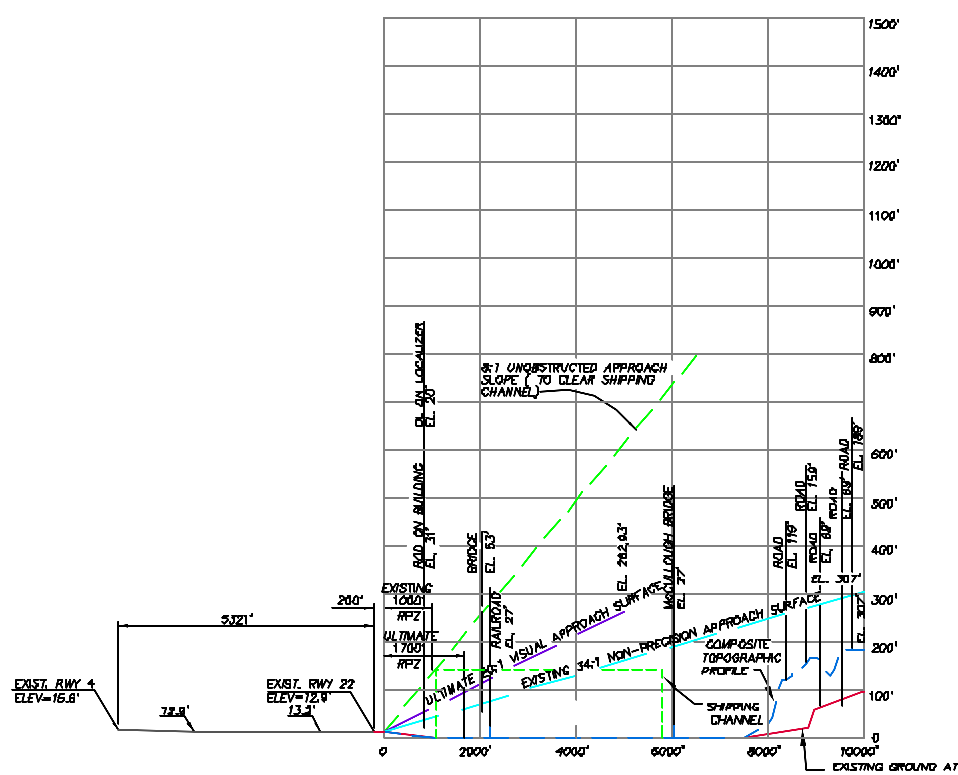
1. OBSTRUCTION INFORMATION WAS OBTAINED FROM THE NOAA AIRPORT OBSTRUCTION CHART AND AERONAUTICAL DATA SHEET, USGS QUAD MAPS, AND AIRPORT MANAGEMENT. NO SURVEY WAS PERFORMED.

2. SEE SHEET 4 FOR PRIMARY SURFACE & ADDITIONAL APPROACH SURFACE OBSTRUCTIONS.

3. THE PRECISION APPROACH TO RUNWAY 22 FOR THE MLS IS NOT INCORPORATED BECAUSE IT HAS BEEN DECOMMISSIONED AND THE 34:1 APPROACH PROTECTS MORE AIRSPACE THAN THE CURRENT MLS APPROACH.

OBSTRUCTION DATA TABLE

OBSTRUCTION NO.	DESCRIPTION	ELEVATION	PART 77 SURFACE OBSTRUCTED	SURFACE ELEVATION	PENETRATION	PROPOSED DISPOSITION OF OBSTRUCTION
7	OL ON DNE	32'	50:1 APPROACH	31'	1'	LIGHTED



RUNWAY 22 APPROACH ZONE PROFILE

SCALE: HORIZONTAL 1"=2000'
VERTICAL 1"=200'

"THE PREPARATION OF THESE DOCUMENTS MAY HAVE BEEN SUPPORTED, IN PART THOUGH THE AIRPORT IMPROVEMENT PROGRAM FINANCIAL ASSISTANCE FROM THE FEDERAL AVIATION ADMINISTRATION (PROJECT NUMBER 3-41-0041-14) AS PROVIDED UNDER TITLE 49, UNITED STATES CODE, SECTION 47104. THE CONTENTS DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THESE DOCUMENTS BY THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATE IN ANY DEVELOPMENT DEPICTED HEREIN NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE IN ACCORDANCE WITH APPROPRIATE PUBLIC LAWS."

W&H PACIFIC
8405 SW Nimbus Avenue
Beaverton, Oregon 97008-7141
(503)626-0455
(503)526-0775 Fax
whpacific.com

PORT OF COOS BAY
NORTH BEND MUNICIPAL AIRPORT
RWY 4-22 APPROACH ZONE PROFILES

NORTH BEND OREGON

DRAWING FILE NAME: ANBMPP01

PROJECT NO. 819142

SCALE: 1"=2000'

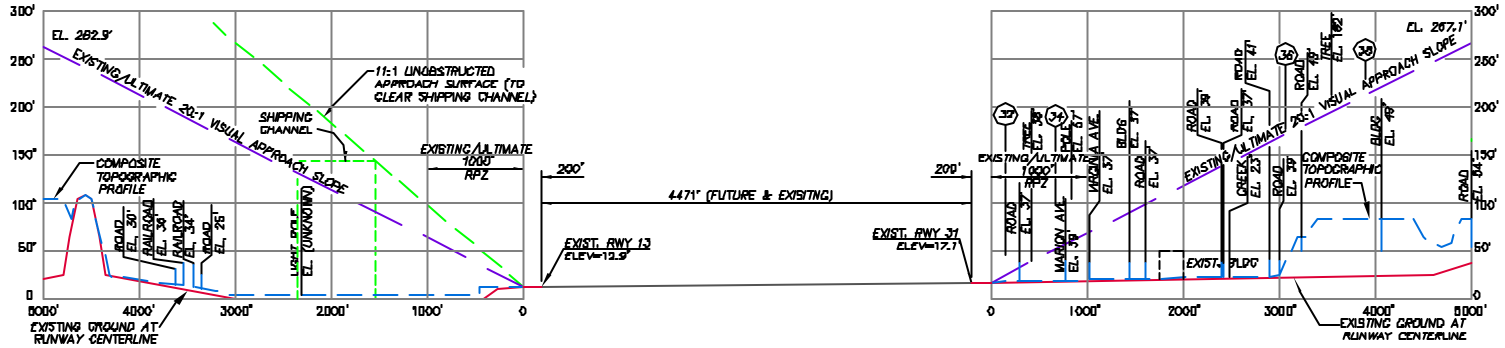
Coffman Associates Airport Consultants

DESIGNED BY: LAM
DRAWN BY: RAT
LAST EDIT: 7/10/02
CHECKED BY: REA
APPROVED BY:
PLOT DATE: 10/29/02

DATE	BY	REV	REVISION	CK'D	APPR

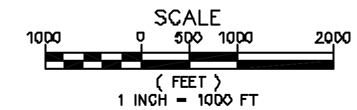
SHEET 5/9
5

DWG INDEX:



RUNWAY 13-31 PROFILE

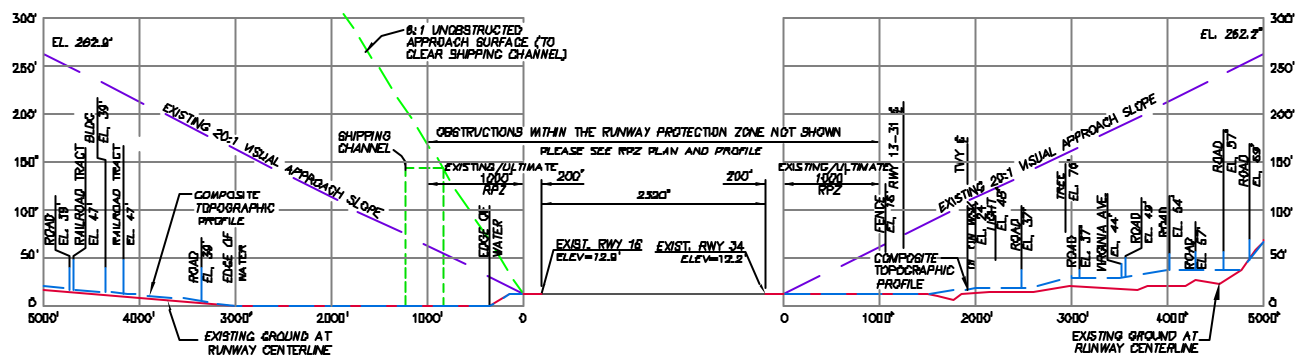
SCALE: HORIZONTAL 1"=1000'
VERTICAL 1"=100'



OBSTRUCTION DATA TABLE						
OBSTRUCTION NO.	DESCRIPTION	ELEVATION	PART 77 SURFACE OBSTRUCTED	SURFACE ELEVATION	PENETRATION	PROPOSED DISPOSITION OF OBSTRUCTION
32	TREE	45'	20:1 APPROACH	25'	20'	TOP OR REMOVE
34	POLE	52'	20:1 APPROACH	51'	1'	TO BE LIGHTED
36	TREE	176'	HORIZONTAL	167'	9'	TOP OR REMOVE
38	TREE	228'	HORIZONTAL	167'	61'	TOP OR REMOVE

NOTES:

1. OBSTRUCTION INFORMATION WAS OBTAINED FROM THE NOAA AIRPORT OBSTRUCTION CHART AND AERONAUTICAL DATA SHEET, USGS QUAD MAPS, AND AIRPORT MANAGEMENT. NO SURVEY WAS PERFORMED.
2. SEE SHEET 4 FOR PRIMARY SURFACE & ADDITIONAL APPROACH SURFACE OBSTRUCTIONS.



RUNWAY 16-34 PROFILE

SCALE: HORIZONTAL 1"=1000'
VERTICAL 1"=100'

"THE PREPARATION OF THESE DOCUMENTS MAY HAVE BEEN SUPPORTED, IN PART THROUGH THE AIRPORT IMPROVEMENT PROGRAM FINANCIAL ASSISTANCE FROM THE FEDERAL AVIATION ADMINISTRATION (PROJECT NUMBER 3-41-0041-14) AS PROVIDED UNDER TITLE 49, UNITED STATES CODE, SECTION 47104. THE CONTENTS DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THESE DOCUMENTS BY THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATE IN ANY DEVELOPMENT DEPICTED HEREIN NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE IN ACCORDANCE WITH APPROPRIATE PUBLIC LAWS."

8405 SW Nimbus Avenue
Beaverton, Oregon 97008-7141
(503)626-0455
(503)526-0775 Fax
whpacific.com
A Member of the IT Group

PORT OF COOS BAY
NORTH BEND MUNICIPAL AIRPORT
RWY 13-31 & RWY 16-34 APPROACH ZONE PROFILES

NORTH BEND OREGON

DRAWING FILE NAME: ANBMPP02

PROJECT NO. 819142

SCALE: 1"=1000'

Coffman Associates Airport Consultants

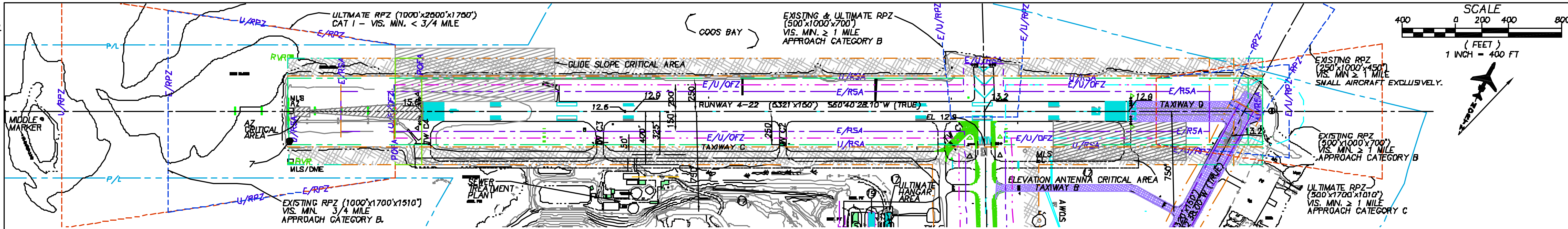
DESIGNED BY: LAM CHECKED BY:
DRAWN BY: RAT APPROVED BY: REA
LAST EDIT: 7/10/02 PLOT DATE: 10/29/02

DATE	BY	REV	REVISION	CK'D	APPR

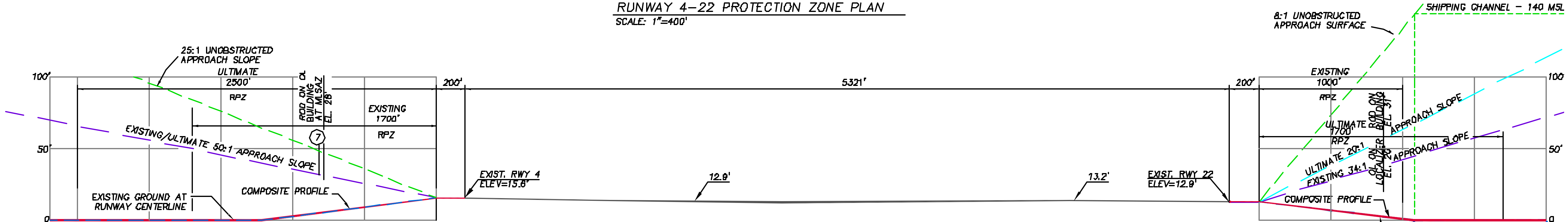
SHEET 6/9

6

DWG INDEX:



RUNWAY 4-22 PROTECTION ZONE PLAN
SCALE: 1"=400'



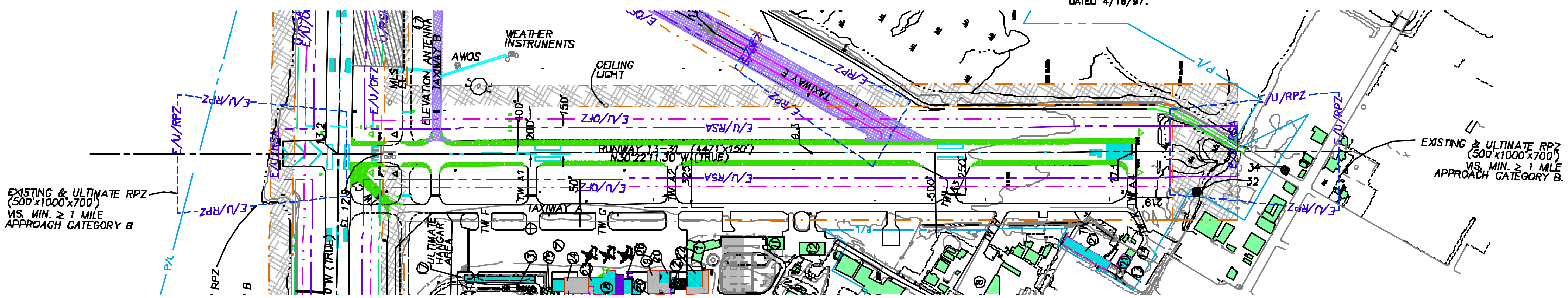
RUNWAY 4-22 PROTECTION ZONE PROFILE
SCALE: HORIZONTAL 1"=400'
VERTICAL 1"=40'

NOTES:

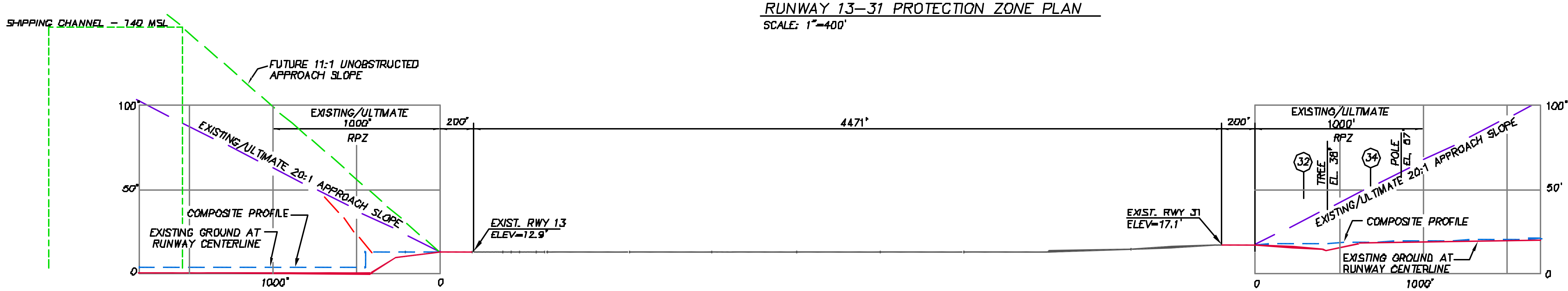
1. OBSTRUCTION INFORMATION WAS OBTAINED FROM THE NOAA AIRPORT OBSTRUCTION CHART AND AERONAUTICAL DATA SHEET, USGS QUAD MAPS, AND AIRPORT MANAGEMENT. NO SURVEY WAS PERFORMED.
2. SEE SHEET 4 FOR PRIMARY SURFACE & ADDITIONAL APPROACH SURFACE OBSTRUCTIONS.
3. THE PRECISION APPROACH TO RUNWAY 22 FOR THE MLS IS NOT INCORPORATED BECAUSE IT HAS BEEN DECOMMISSIONED AND THE 34:1 APPROACH PROTECTS MORE AIRSPACE THAN THE CURRENT MLS APPROACH.
4. THE RUNWAY BEARINGS SHOWN ARE BASED OFF OF GEODETIC CALCULATIONS FROM RUNWAY END COORDINATES OBTAINED FROM THE NOAA AIRPORT OBSTRUCTION CHART AND AERONAUTICAL DATA SHEET, DATED 4/18/97.

OBSTRUCTION DATA TABLE

OBSTRUCTION NO.	DESCRIPTION	ELEVATION	PART 77 SURFACE OBSTRUCTED	SURFACE ELEVATION	PENETRATION	PROPOSED DISPOSITION OF OBSTRUCTION
7	OL ON DME	32'	50:1 APPROACH	31'	1'	OBJECT LIGHT
32	TREE	45'	20:1 APPROACH	25'	20'	TOP OR REMOVE
34	POLE	52'	20:1 APPROACH	51'	1'	ADD OBJECT LIGHT



RUNWAY 13-31 PROTECTION ZONE PLAN
SCALE: 1"=400'



RUNWAY 13-31 PROTECTION ZONE PROFILE
SCALE: HORIZONTAL 1"=400'
VERTICAL 1"=40'

NOTE:
VEHICLES PASSING ON THE ROADWAY AT THE POINT NEAREST THE RUNWAY DO NOT PERMIT AN UNOBSTRUCTED APPROACH SURFACE GREATER THAN 1:1.

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W&H PACIFIC
8405 SW Nimbus Avenue
Beaverton, Oregon 97008-7141
(503)626-0455
(503)526-0775 Fax
whpacific.com

PORT OF COOS BAY
NORTH BEND MUNICIPAL AIRPORT
RWY 4-22 & 13-31 PROTECTION ZONE PLANS & PROFILES
NORTH BEND OREGON

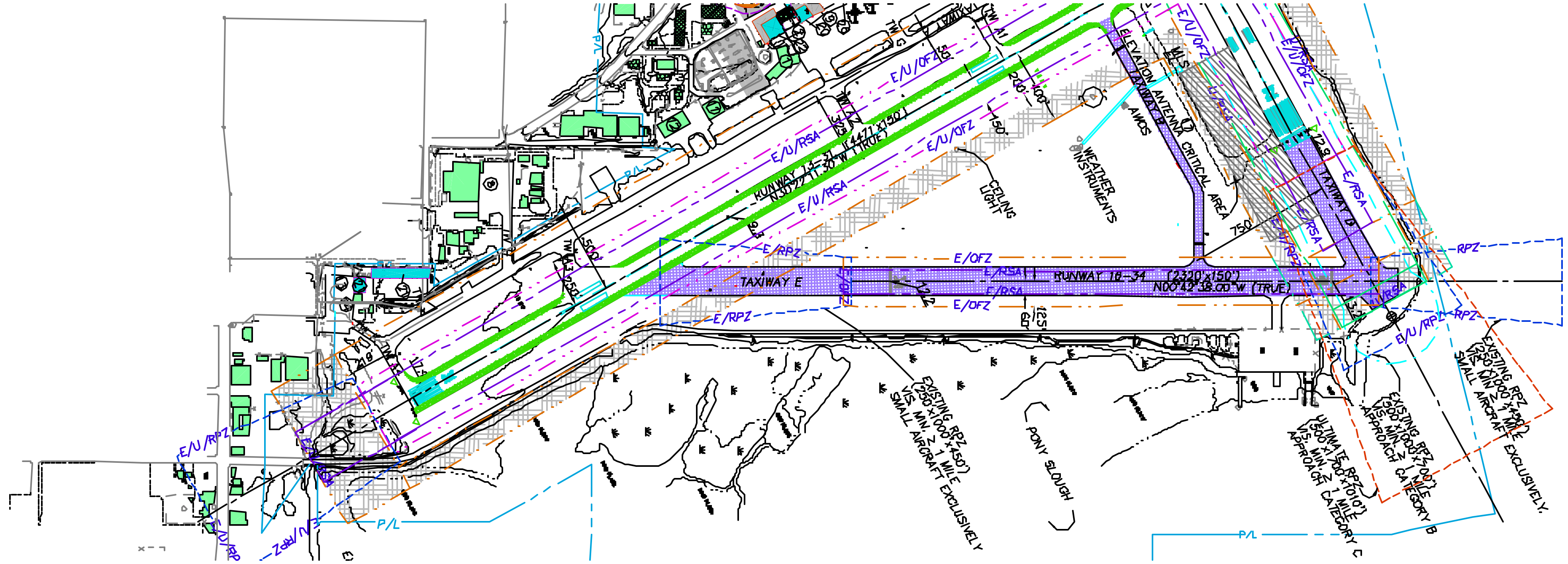
SCALE:	PROJECT NO.	DRAWING FILE NAME:
1"=400'	819142	ANBMPP03

Coffman Associates Airport Consultants

DESIGNED BY: LAM	CHECKED BY: MN		
DRAWN BY: RAT	APPROVED BY:		
LAST EDIT: 7/10/02	PLOT DATE: 11/05/02		
DATE	BY	REV#	REVISION	CK'D	APPR.

SHEET 7/9
7

DWG INDEX:



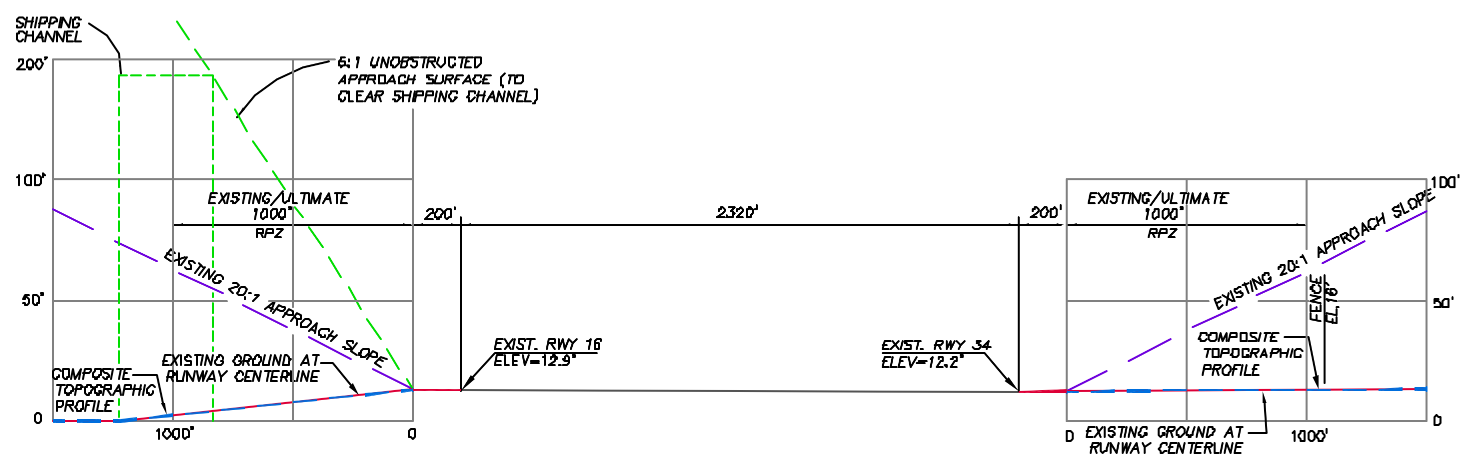
RUNWAY 16-34 PROTECTION ZONE PLAN

SCALE: 1"=400'

NOTES:

1. OBSTRUCTION INFORMATION WAS OBTAINED FROM THE NOAA AIRPORT OBSTRUCTION CHART AND AERONAUTICAL DATA SHEET, USGS QUAD MAPS, AND AIRPORT MANAGEMENT. NO SURVEY WAS PERFORMED.
2. SEE SHEET 4 FOR PRIMARY SURFACE & ADDITIONAL APPROACH SURFACE OBSTRUCTIONS.
3. THE RUNWAY BEARINGS SHOWN ARE BASED OFF OF GEODETIC CALCULATIONS FROM RUNWAY END COORDINATES OBTAINED FROM THE NOAA AIRPORT OBSTRUCTION CHART AND AERONAUTICAL DATA SHEET, DATED 4/18/97.

SCALE
200 0 100 200 400
(FEET)
1 INCH = 200 FT



RUNWAY 16-34 PROTECTION ZONE PROFILE

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

"THE PREPARATION OF THESE DOCUMENTS MAY HAVE BEEN SUPPORTED, IN PART THOUGH THE AIRPORT IMPROVEMENT PROGRAM FINANCIAL ASSISTANCE FROM THE FEDERAL AVIATION ADMINISTRATION (PROJECT NUMBER 3-41-0041-14) AS PROVIDED UNDER TITLE 49, UNITED STATES CODE, SECTION 47104. THE CONTENTS DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THESE DOCUMENTS BY THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATE IN ANY DEVELOPMENT DEPICTED HEREIN NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE IN ACCORDANCE WITH APPROPRIATE PUBLIC LAWS."

W&H PACIFIC
8405 SW Nimbus Avenue
Beaverton, Oregon 97008-7141

PORT OF COOS BAY
NORTH BEND MUNICIPAL AIRPORT
RWY 16-34 PROTECTION ZONE PLAN & PROFILE

NORTH BEND OREGON

SCALE: 1"=400' | PROJECT NO. 819142 | DRAWING FILE NAME: ANBMPP04

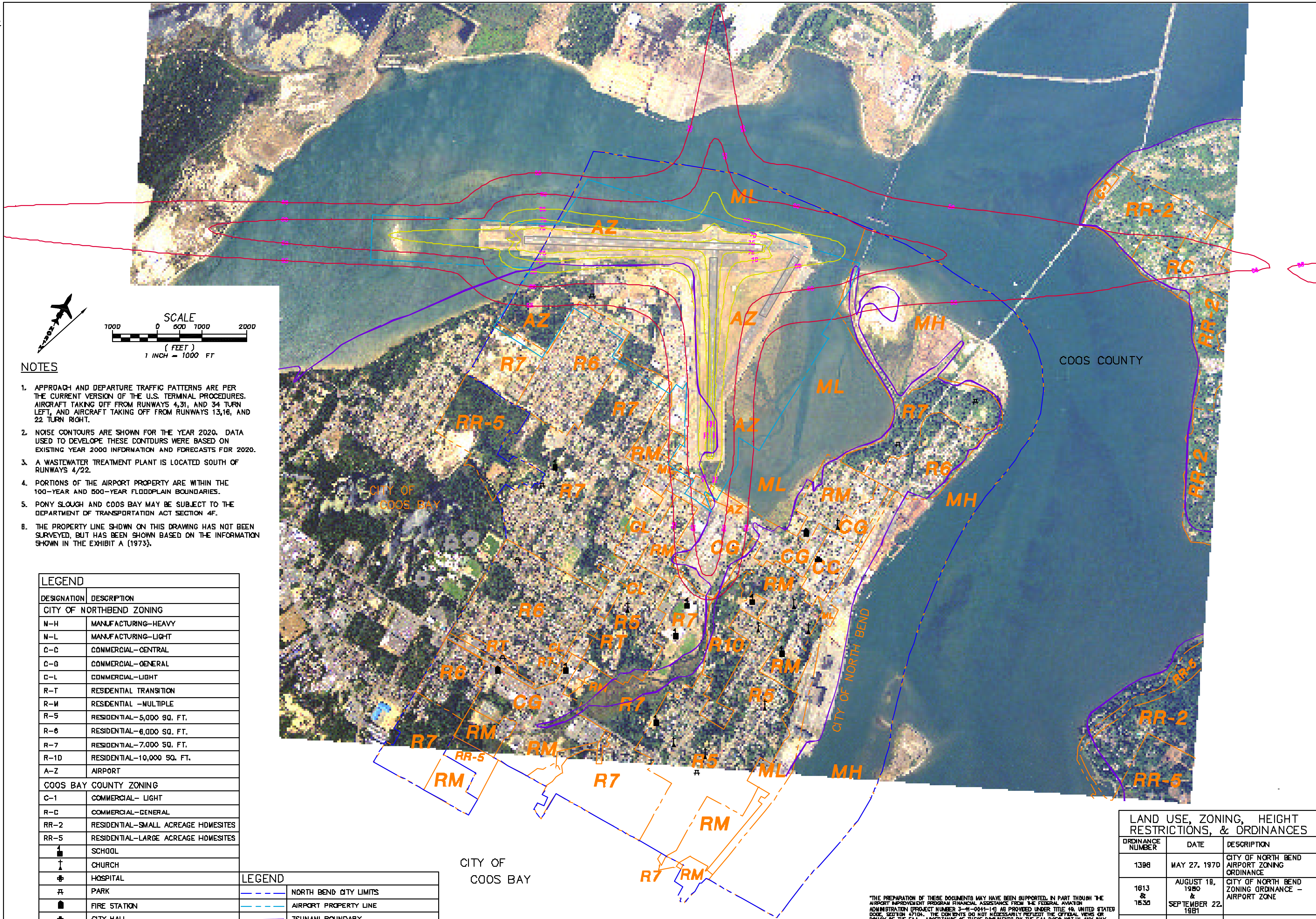
Coffman Associates Airport Consultants

DESIGNED BY: LAM CHECKED BY: MN
DRAWN BY: RAT APPROVED BY:
LAST EDIT: 7/10/02 PLOT DATE: 11/05/02

DATE	BY	REV#	REVISION	CK'D	APPR.

SHEET 8/9
8

DWG INDEX:



NOTES

1. APPROACH AND DEPARTURE TRAFFIC PATTERNS ARE PER THE CURRENT VERSION OF THE U.S. TERMINAL PROCEDURES. AIRCRAFT TAKING OFF FROM RUNWAYS 4,31, AND 34 TURN LEFT, AND AIRCRAFT TAKING OFF FROM RUNWAYS 13,16, AND 22 TURN RIGHT.
2. NOISE CONTOURS ARE SHOWN FOR THE YEAR 2020. DATA USED TO DEVELOPE THESE CONTOURS WERE BASED ON EXISTING YEAR 2000 INFORMATION AND FORECASTS FOR 2020.
3. A WASTEWATER TREATMENT PLANT IS LOCATED SOUTH OF RUNWAYS 4/22.
4. PORTIONS OF THE AIRPORT PROPERTY ARE WITHIN THE 100-YEAR AND 500-YEAR FLOODPLAIN BOUNDARIES.
5. PONY SLOUGH AND COOS BAY MAY BE SUBJECT TO THE DEPARTMENT OF TRANSPORTATION ACT SECTION 4F.
6. THE PROPERTY LINE SHOWN ON THIS DRAWING HAS NOT BEEN SURVEYED, BUT HAS BEEN SHOWN BASED ON THE INFORMATION SHOWN IN THE EXHIBIT A (1973).

LEGEND

DESIGNATION	DESCRIPTION
CITY OF NORTHBEND ZONING	
M-H	MANUFACTURING-HEAVY
M-L	MANUFACTURING-LIGHT
C-C	COMMERCIAL-CENTRAL
C-G	COMMERCIAL-GENERAL
C-L	COMMERCIAL-LIGHT
R-T	RESIDENTIAL TRANSITION
R-M	RESIDENTIAL -MULTIPLE
R-5	RESIDENTIAL-5,000 SQ. FT.
R-6	RESIDENTIAL-6,000 SQ. FT.
R-7	RESIDENTIAL-7,000 SQ. FT.
R-10	RESIDENTIAL-10,000 SQ. FT.
A-Z	AIRPORT
COOS BAY COUNTY ZONING	
C-1	COMMERCIAL- LIGHT
R-C	COMMERCIAL-GENERAL
RR-2	RESIDENTIAL-SMALL ACREAGE HOMESITES
RR-5	RESIDENTIAL-LARGE ACREAGE HOMESITES
(symbol)	SCHOOL
(symbol)	CHURCH
(symbol)	HOSPITAL
(symbol)	PARK
(symbol)	FIRE STATION
(symbol)	CITY HALL

LEGEND

(line)	NORTH BEND CITY LIMITS
(line)	AIRPORT PROPERTY LINE
(line)	TSUNAMI BOUNDARY

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LAND USE, ZONING, HEIGHT RESTRICTIONS, & ORDINANCES

ORDINANCE NUMBER	DATE	DESCRIPTION
1398	MAY 27. 1970	CITY OF NORTH BEND AIRPORT ZONING ORDINANCE
1613 & 1636	AUGUST 18, 1980 & SEPTEMBER 22. 1981	CITY OF NORTH BEND ZONING ORDINANCE - AIRPORT ZONE
1654	SEPTEMBER 28. 1982	COOS BAY ESTUARY MANAGEMENT PLAN

W&H PACIFIC
5405 SW Nimbus Avenue
Beaverton, Oregon 97008-7141

PORT OF COOS BAY NORTH BEND MUNICIPAL AIRPORT
MASTER PLAN
LAND USE PLAN

NORTH BEND OREGON

DRAWING FILE NAME: ANBMLU01.DWG

PROJECT NO. 319142

SCALE: 1"=1000'

Coffman Associates Airport Consultants

DESIGNED BY: LAM CHECKED BY: MN
DRAWN BY: RAT APPROVED BY:
LAST EDIT: 7/10/02 PLOT DATE: 11/05/02

DATE	BY	REV#	REVISION	CK'D	APPR

SHEET 9/9
9