Rogue Valley International - Medford Airport

AIRPORT MASTER PLAN

AIRPORT MASTER PLAN

for

Rogue Valley International-
Medford Airport
Medford, Oregon

Final Technical Report

Prepared by
COFFMAN ASSOCIATES, INC.

In Association With
David Evans and Associates
and
Dr. Lee McPheters

February 2001

"The preparation of this document was financed with Passenger Facility Charges (PFCs)approved under application No. 98-04-C-00-MFR. The contents do not necessarily reflect the official views or policy of the FAA. Acceptance of this report by the FAA does not in any way constitute a commitment on the part of the United States to participate in any development depicted herein nor does it indicate that the proposed development is environmentally acceptable in accordance with appropriate public laws."

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Medford, Oregon

AIRPORT MASTER PLAN
Final Technical Report
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Introduction

This Master Plan for Rogue Valley International-Medford Airport is being undertaken by the Jackson County Airport Authority to outline a long range, orderly direction for airport development which will yield a safe, efficient, economical, and environmentally acceptable air transportation facility. The study is being funded with passenger facility charges. Technical work is being led by Coffman Associates, Inc. with assistance from David Evans and Associates (airport layout drawings) and Dr. Lee McPheters (economic benefit analysis).

In addition to the consultant team and members of the Airport Authority and its staff who will be involved in the study, the Airport Authority has identified a number of community planners, state and federal agency personnel, and representatives of the aviation community to review the various aspects of the plan as it is developed. The committee will review workings papers on the project and provide input and comment throughout the study to help ensure that a realistic, viable plan is developed. To assist the review process, draft working papers are being submitted in a workbook format. As new information is developed, it can be inserted in the workbook behind the appropriate tab.

The Master Plan provides a step-by-step or phased outline for development and gives the Airport Authority advance notice of pending needs to aid in future scheduling and budgeting. This allows for orderly and timely improvements. To accomplish this, the Master Plan is being prepared in a systematic fashion that:

- Examines existing and potential future aviation activity at the airport.
- Examines airfield capacity and compares it to demand forecasts.

Relates the existing and potential aviation activity, as well as safety and technological advancements to existing and future facility requirements.

- Formulates and analyzes potential development alternatives.

- Proposes an airport layout plan which is compatible with both aviation demands and the local environment.

- Schedules priorities and phases proposed development based upon actual demand and estimates development costs and funding sources.

This Master Plan is actually an update of previous Master Plans that were undertaken by the Airport Authority in 1986 and 1993. Many of the recommendations of these Master Plans have been implemented. A project to extend the primary runway to 8,800 feet is presently underway. To be completed in three phases over the next couple of years, the project will also extend a taxiway to the Foreign Trade Zone which is located on the east side of the airport. These projects are expected to create additional demand for air cargo. In addition, the airport has experienced significant growth in passenger demand over the past five years (increasing by 50 percent), creating added demand on terminal and auto parking.

As a result, this update will concentrate on updating those components of the Master Plan that are affected by airline passenger and cargo growth. These components include the airfield, the passenger terminal, access and parking, and cargo and support facilities. Revisions to the general aviation plan will also be reflected in the airport layout plan and the capital improvement plan.

The forecasts of all sectors of aviation activity at the airport have been updated in Chapter Two. This includes the passenger airlines, air cargo, and general aviation. The forecasts outline the realistic potential for air traffic growth that can then be related to future facility needs on the airport.

The following project schedule depicts subsequent submittals and a proposed meeting schedule. The meetings with the Planning Advisory Committee should take place at intervals of two months. On behalf of the Airport Authority, we would like to thank you for taking the time to participate.

INVENTORY

The initial step in the preparation of a 20-year master plan is the collection or identification of information pertinent to Rogue Valley International - Medford (formerly known as Medford - Jackson County Airport) and the surrounding area. There have been significant changes in activity at the airport, and the facilities which serve this demand, since the last master plan was undertaken in 1992. This chapter will organize the information, providing a foundation for subsequent planning analyses. Included within the analysis will be airside and landside facilities, nearby airports, and socioeconomic information on the Medford area, with special emphasis on the changes over the past decade.

The information collected for this chapter was obtained from several sources: on-site inspections, airport records, review of other planning studies, interviews with airport staff, planning associations or tenants, and a number of on-line (Internet) sites which presently provide statistical information and documents.

As with any airport planning study, an attempt has been made to utilize existing data, or information in associated planning documents, to the maximum extent possible.

AIRPORT SETTING

Rogue Valley International - Medford Airport serves as a primary commercial service airport for Southwest Oregon, with its service area extending into Northwest California. Situated along Interstate 5, and only 30 minutes from the California border, the airport is located only five minutes from downtown Medford. The geographic setting has been depicted on **Exhibit 1A**.

Located in Jackson County, the population for the county in the last decade has increased by 15 percent, to a level slightly above 175,000. This exceeds the growth experienced in the 80s, when the county population increased by 10.5 percent. Medford is the largest city in the county, with a population in excess of 60,000. It is the industrial, medical, and service center for Southwest Oregon and Northwest California.

Medford is strategically located for reaching domestic and international markets. In addition to the three scheduled airlines and a half dozen charter airlines providing service through the airport, there are over 30 motor freight trucking companies and eleven freight brokers based in the Jackson/Josephine County area. There are also four integrated carriers, seven delivery services, and two freight forwarders. The Central Oregon and Pacific Railroad maintains main and branch lines through the area.

In partnership with ORE-CAL Trade Corporation, the east side of RVI Airport has become the viable location for the future of air cargo on-field. With Foreign Trade Zone designation, and the services of all necessary federal inspection agencies for international traffic, the newly developed Robert F. Smith North American Trade Center represents the newest significant international port of entry on the West Coast of the United States. A newly constructed apron servicing Airport Commerce Park greatly enhances the services of the airport. The following agencies and organizations are currently in the Park:

- United States Customs Service
- United States Immigration and Naturalization Service
- United States Department of Agriculture - APHIS
- United States Fish and Wildlife
- Southern Oregon International Trade Council (SOITC)
- Foreign Commercial Service/ Export Assistance
- International Wildlife Recovery Center
- Korean Consulate Office

At 1,382 feet above sea level, Medford is protected by surrounding mountains, and the area is favored with a mild climate. Annual rainfall is 18-20 inches, about the same as San Francisco. The seasons are clearly defined, temperatures are generally mild overall, and yearly snowfall in the valley floor is only 3-4 inches. The median winter temperature is 36 degrees. Summers are warm with a median temperature of 94 degrees and an average of 15 days over 100 degrees.

AIRPORT SYSTEM PLANNING ROLE

Airport planning exists at local, regional, and national levels. Each level has a different emphasis and purpose. The update of Rogue Valley International-Medford Airport's master plan provides planning at the local level. At the state level, the Oregon Department of Transportation, Aeronautics Section has prepared a *Statewide Aviation System Plan*. This document provides an assessment of capital needs within the overall statewide airport system.

99MP08-1A-8/25/99

JACKSON COUNTY
Airport Authority

Exhibit 1A
LOCATION MAP

At the national level, Rogue Valley International - Medford Airport is included in the *National Plan of Integrated Airport Systems 1998-2002 (NPIAS)*. This planning document includes 3,344 existing airports which are significant to national air transportation and estimates that $35.1 billion in infrastructure development (that is eligible for Federal aid) will be needed over the next five years to meet the needs of all segments of civil aviation. Airports with significant commercial service account for 82 percent of the total development needs.

AIRPORT ADMINISTRATION AND HISTORY

Rogue Valley International - Medford Airport is owned and operated by Jackson County. A seven-member airport advisory committee appointed by the Board of Commissioners provides recommendations to airport administration regarding airport needs, operational improvements and service to tenants. The Airport Director, who reports to the county administrator, is responsible for the operation and maintenance of the airport as well as providing the county with recommendations for continued improvements at the airport.

Medford Municipal Airport began operation officially on August 4, 1930. The new airstrip, located on the present site, was completed in October 1929. The first tri-motor passenger planes on the Oakland-Seattle run used Medford as a regular stop. On August 22, 1944, fresh fruit, flowers, and fish were flown from Medford to New York City, demonstrating the possibilities of air shipment of perishables from Medford and the viability of transcontinental air freight movements.

During World War II, the War Department controlled the airport, leasing the facility from the City of Medford. During this period, the total acreage of the airport was increased from 400 to 550 acres. The added acreage was deeded to the City after the war.

Mercy Flights was established at the airport in 1949. The original mission was to transport those ill in outlying areas to more comprehensive medical facilities. Over 10,000 patients have been flown since the company began. In 1990, Mercy Flights purchased Medford Ambulance and began ground ambulance service under the same nonprofit philosophy. Presently, the company has air and ground divisions, with helicopter services.

In 1952, a federal grant was received to purchase the existing United Airlines Company building, which would be integrated into the terminal building. An airport beacon was added atop the control tower at the same time.

The U.S. Forest Service air tanker base has been providing air support for the suppression of forest fires in the area since 1958.

In 1971, voters approved transfer of ownership of the airport from the City of Medford to Jackson County. In the following years, the terminal building was expanded, improvements were made on the airfield, new emergency response equipment was added, and

other safety and security projects were undertaken to meet new demands and comply with federal standards. In 1995, the Department of Commerce announced that Jackson County had been awarded the newest foreign trade zone in the country. Airport Commerce Park has experienced rapid growth in the past few years. The latest project on the airport, the 2,100-foot extension of the main runway, parallel taxiway, and connecting taxiways to Airport Commerce Park provides enhanced cargo capacity and greatly expanded service capabilities in the ability to bring international traffic directly to the Robert F. Smith North American Trade Center.

AIR TRAFFIC ACTIVITY

Air traffic activities are recorded monthly by the airport administration upon receipt of activity summaries from the airlines. Each of the scheduled passenger airlines report passenger, operations, air freight and air mail statistics to the airport. A summary of the annualized data since 1990 has been depicted on **Exhibit 1B**. As footnoted on the exhibit, the air freight information which is presented is only from the scheduled airlines (and does not include the all-cargo carriers). Total operations in each category (air carrier, air taxi, general aviation and military) on the airfield are recorded by the airport traffic control tower and posted on the Federal Aviation Administration's web site each month (www.faa.gov). The following chapter (aviation demand forecasts) presents detailed summaries of the historical activity. At this time, the airport is enplaning (boarding) approximately 220,000 annual passengers through the terminal. In 1998, there were 70,000 annual operations (landings and take offs). The civilian operators employ a base of 150 aircraft on the airfield.

The airlines providing scheduled service include: Horizon, United, and United Express. Non-stop service is currently provided to Portland, Seattle, San Francisco, and Los Angeles with continuing service to Las Vegas, Spokane, and Vancouver. The top twenty markets, based on highest passenger volumes, have changed somewhat during the 90s, although the top markets are very similar. **Exhibit 1C** presents the top twenty markets, based upon ten percent sample passenger surveys undertaken by the Department of Transportation in 1998. By comparison, in 1991, the top twenty markets were Portland, San Francisco, Los Angeles, Seattle, San Diego, Ontario, Burbank, Denver, Orange County, Phoenix, Chicago, Las Vegas, Honolulu, Long Beach, Washington D.C., Minneapolis-St. Paul, Dallas-Ft. Worth, Salt Lake City, Boston, and Anchorage.

LOCAL HISTORY AND COMMUNITY PROFILE

The Rogue Valley obtained its name from the Rogue Indians, who referred to the local area as The Valley of the Rogue. Gold was discovered in 1852, bringing miners to the valley, followed by farmers who discovered the fertile soil and favorable growing conditions. The California-Oregon Stage Road provided access to the communities of

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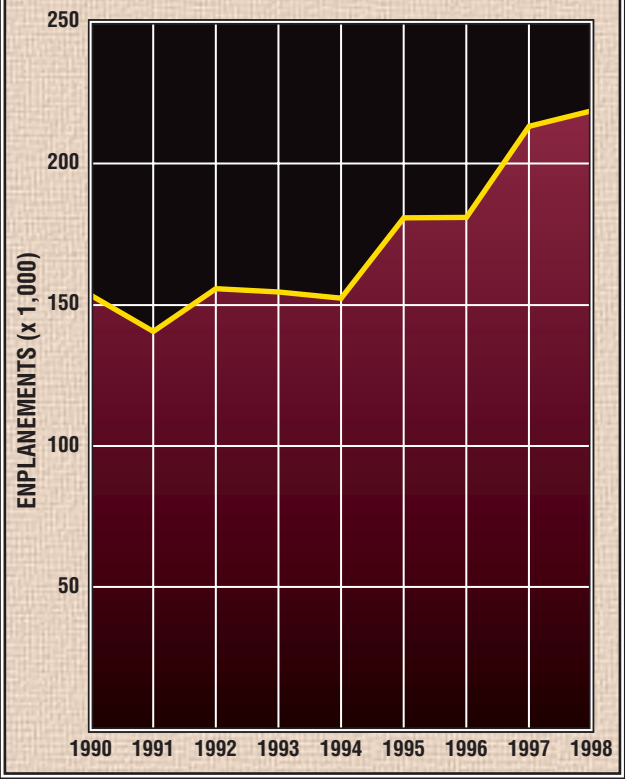
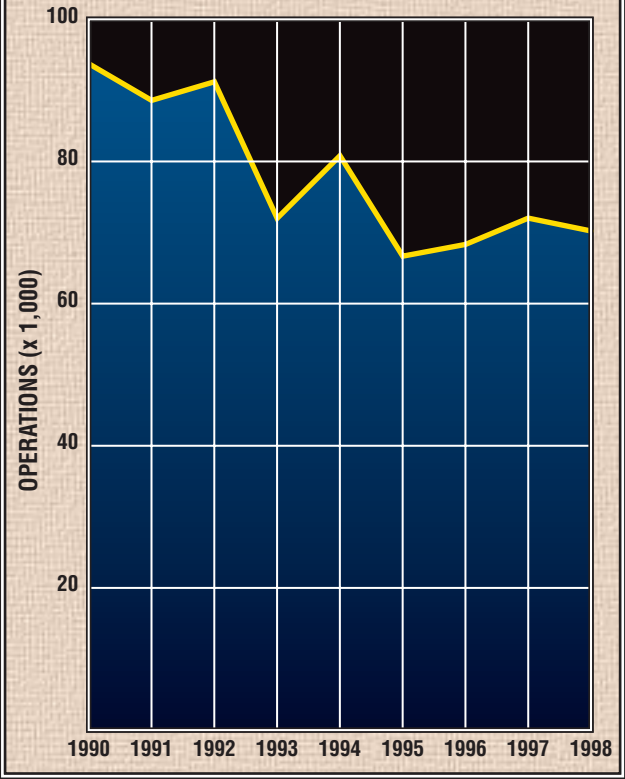
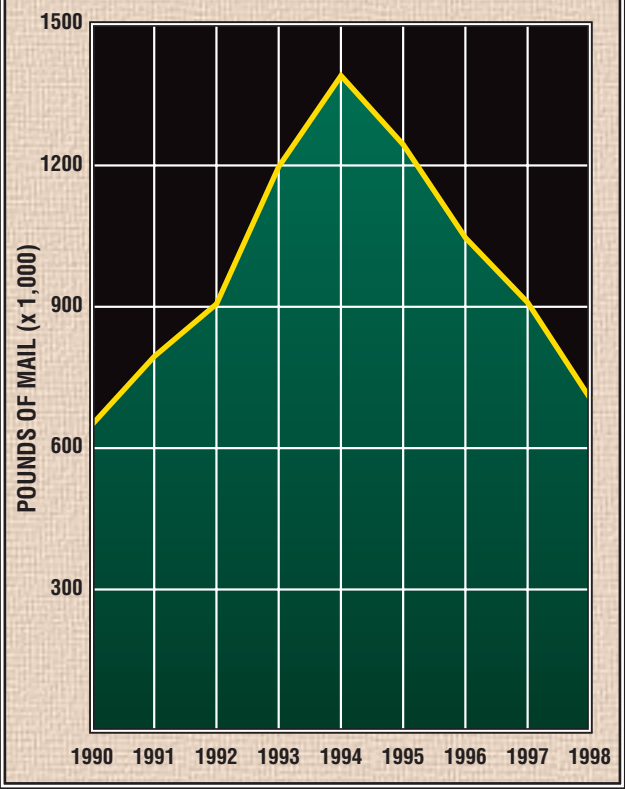
PASSENGER ENPLANEMENTS



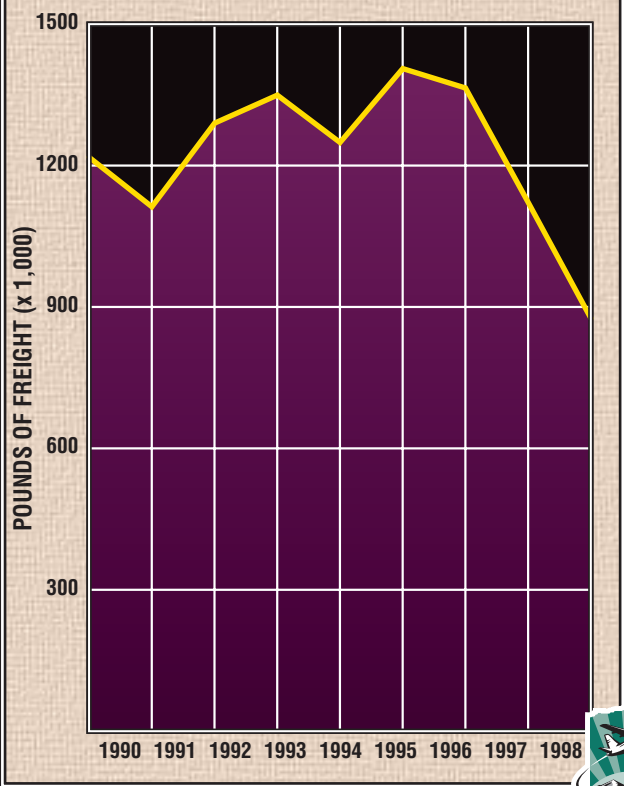
ANNUAL OPERATIONS



MAIL TOTAL



FREIGHT TOTAL*



* Scheduled airlines only

JACKSON COUNTY Airport Authority

Exhibit 1B
AIRPORT ACTIVITY SUMMARY

99MP08-1C-9/1/99

	City	Number of Passengers in Sample - Outbound plus Inbound	% of Total
1.	SFO - San Francisco, California	5,298	12.9%
2.	PDX - Portland, Oregon	4,634	11.3%
3.	LAX - Los Angeles, California	2,974	7.2%
4.	SEA - Seattle/Tacoma, Washington	2,805	6.8%
5.	SAN - San Diego, California	1,545	3.8%
6.	PHX - Phoenix, Arizona	1,446	3.5%
7.	LAS - Las Vegas, Nevada	1,422	3.5%
8.	ONT - Ontario, California	1,410	3.4%
9.	SNA - Santa Ana (Orange County), California	1,146	2.8%
10.	BUR - Burbank, California	1,142	2.8%
11.	DEN - Denver, Colorado	1,053	2.6%
12.	CHI - Chicago, Illinois	791	1.9%
13.	NYC - New York, New York	722	1.8%
14.	WAS - Washington, D.C.	677	1.6%
15.	MSP - Minneapolis/St. Paul, Minnesota	536	1.3%
16.	HNL - Honolulu, Hawaii	525	1.3%
17.	SLC - Salt Lake City, Utah	523	1.3%
18.	ANC - Anchorage, Alaska	453	1.1%
19.	MCI - Kansas City, Missouri	431	1.1%
20.	MCO - Orlando, Florida	423	1.0%
	Sample Total:	41,157	

JACKSON COUNTY
Airport Authority

Exhibit 1C
TOP-TWENTY O&D MARKETS-1998

Ashland, Talent, Phoenix, Jacksonville, and Central Point, until the Oregon & California Railroad reached the area in 1883. While Jacksonville (the county seat at the time) was expected to be the next station between Portland and Sacramento, they did not offer a bonus to the railroad, and the station was placed at Middle Fork on Bear Creek (now Medford).

The population of Medford had reached 2,500 by 1896, and it had established itself as a major shipping and railway center. Today, Medford is the business, commercial, and professional center for the region, which includes Southwest Oregon and Northwest California. The lack of local sales taxes attracts Californians, as well as the density of retail development in Medford. The timber industry, agriculture, and tourism all contribute to the local economy. The Medford area is home to a wide variety of large and small manufacturing plants. Leading employment groups include lumber and wood products, fruit packs, grain crops, construction products, microfilm products, and sophisticated bearings and cylinders.

AIRSIDE FACILITIES

Airside facilities include runways, taxiways, lighting, and navigational aids. Information relevant to the two-runway system is summarized in the following paragraphs. The airfield facilities are depicted on **Exhibit 1D**.

The two active runways on the airfield are Runway 14-32 (the primary runway) and Runway 9-27 (the secondary crosswind runway). Runway 14-32 is 8,800 feet long by 150 feet wide, while Runway 9-27 is 3,155 feet long by 100 feet wide. The primary runway is stressed to handle most aircraft operating in the commercial fleet, while the crosswind runway is limited to small aircraft weighing less than 12,500 pounds.

Several connecting taxiways and exits are available to aircraft operating on the airfield. These are best exemplified on **Exhibit 1D**. The recent runway extension project extended a taxiway to the east side of the airfield, connecting with a ramp on foreign trade zone property.

The primary runway is equipped with high intensity edge lights, a medium intensity approach light system with runway alignment indicator lights (on the 14 approach), and touchdown zone/ centerline lighting. This runway also has visual approach aids: a 4-light PAPI on Runway 14 and a 4-box VASI on Runway 32. During periods when the control tower is closed, the airfield lighting may be activated with radio control.

The crosswind runway is equipped with medium intensity edge lights, but no other navigational aids. It is limited to operations by small aircraft.

LANDSIDE FACILITIES

The landside facilities include terminal, fixed base and corporate aviation facilities, storage hangars, the U.S. Forest Service facilities, and various facilities which provide support to the airport operation.

TERMINAL

Originally constructed in the early 50s, the ticketing wing of the terminal faces onto Runway 14-32, while the bag claim wing faces onto the crosswind runway. The separation between the building and the primary runway create inadequate clearances to the building and aircraft parking positions. Within the building, passenger circulation is relatively clear, although the interior can become congested during peak periods. The airline offices and bag make-up areas are located immediately behind the ticketing counters, but area is limited.

The departure lounges offer both ground-level and second-level boarding. The bag claim area consists of a single flat-bed recirculating device. Food service and concessions are centrally located. Total enclosed space on the ground level has been estimated at 31,550 square feet. The terminal layout has been depicted on **Exhibit 1E**.

The rental car return lot is located adjacent to the ticketing entrance, while the rental car ready lot is located at the exit from the bag claim wing. There are 100 parking spaces in the ready lot and 64 spaces in the return lot. Rental car counters are located in the building corridor between the deplaning area and the bag claim area.

Vehicle parking is located in front of the terminal, and is accessed from the terminal loop road, which has two through lanes. There are 433 parking spaces in the short-term/long-term lot, with an additional 225 parking spaces available in the overflow lots. The employee lot is south of the rental car return lot, and has 183 parking spaces.

The airport administration offices are located in a separate building, opposite the rental car ready lot. This building is nearly 5,000 square feet, and supported by 27 parking spaces.

GENERAL AVIATION

General aviation facilities are located on the west side of the airfield. Several companies provide services to general aviation aircraft, air cargo operators, and persons wishing to charter aircraft.

Logan & Reavis Aviation is a full-service fixed base operator (FBO) providing fuel, parking, pilot lounge, flight school and flight training, aircraft rentals, sightseeing tours and rides, charters, aircraft maintenance, aircraft modifications, aircraft painting and aircraft interiors.

Medford Air Service is a full-service FBO providing fuel, parking, pilot lounge, aircraft maintenance and parts.

Jet Center MFR (which has purchased Pacific Flights) is a full-service FBO providing fuel, parking, charters, aircraft maintenance, avionics service, aircraft sales and leasing, catering, pilot supplies, crew cars, and pilot lounge.

There are several others operators on the airfield contributing to general aviation activity, including Mercy Flights, Erickson Air Crane, Civil Air Patrol, U.S. Forest Service, Superior Air

99MP08-1D-3/12/01

LEGEND

1. National Weather Service
2. Erickson Air Group
3. U.S. Forrest Service
4. Medford Air Service
5. Superior Air Service
6. Maintenance Building
7. Mercy Flights Hangar
8. Pacific Air Research
9. Logan and Reavis
10. Mercy Flights
11. Jet Center - South
12. Airline Terminal
13. Medford Air Cargo
14. Airport Fire Station
15. Federal Express
16. Civil Air Patrol
17. Jet Center - North
18. Airport Administration
19. Storage/Receiving/Inspection Facility
20. INS Facility
21. Federal Inspection Office Facility

NORTH

0 800 1600

SCALE IN FEET

JACKSON COUNTY Airport Authority

Exhibit 1D
EXISTING FACILITIES

99MP08-1E-1/10/01

STAIR TOWER
DINING AREA
DEPARTURE GATES
BAR
SNACK BAR
LOUNGE
KITCHEN
SEC. OFFICE
ARRIVAL GATE
AIRLINE COUNTER
AIRLINE COUNTER
COOLER
OFFICE
FREEZER
SNACKS
TO TOWER
DRY STORAGE
ELEC.
BOILER
CAR RENTAL
INFO & PAGING
AIR CARGO
TICKET LOBBY
ARCADE
RENTAL CAR RETURN / ACE PARKING
STORAGE
CHILLER
STORAGE
GIFT SHOP
AIR CARGO PICK-UP
CENTRAL LOBBY
ENPLANING CURB
WOMEN'S RESTROOM
MEN'S RESTROOM
BAGGAGE CLAIM
RESERVATION CENTER
PHONES
DEPLANING CURB
AIRPORT PARKING
RENTAL CAR READY LOT
NORTH
0
30
60
SCALE IN FEET

JACKSON COUNTY
Airport Authority

Exhibit 1E
TERMINAL LAYOUT

Charter, Pacific Air Research and Medford Air Cargo. The special needs created by each of these operations will be considered during the preparation of the master plan.

AIR CARGO

FedEx, United Parcel Service, and Airborne Express operate on the airfield. FedEx constructed a facility south of the terminal in 1990. This facility provides support to Cessna Caravans (four flights per day), which are operated by Empire Airlines. Medford Air Cargo operates a facility just south of the terminal, as well as a storage and inspection facility with cold storage & truck dock within the North American Trade Center. The air cargo handling company represents proactive development of cargo capacity on-field, and has been instrumental thus far in the establishment of Airport Commerce park. UPS and Airborne are supported by a combination of twin-engine propeller aircraft and small jets operated by Ameriflight. Airborne has constructed a facility next to the "J" hangars, which are at the northern end of the storage hangar area.

SUPPORT FACILITIES

The airport's existing aircraft rescue and firefighting (ARFF) station is located south of the terminal building. The storage/maintenance building is located on the west side of the airfield.

Underground fuel storage is handled by each of the FBOs. Total capacity of Jet-A on the airfield is 76,000 gallons, while AvGas capacity is 45,000 gallons.

ENROUTE NAVIGATION AND AIRSPACE

Several types of navigational aids are available for aircraft enroute to the airport: very high frequency omnidirectional range beacons (VOR), nondirectional beacons (NDB), Loran-C, area navigation (RNAV), and the global positioning system (GPS).

VORs provide azimuth readings to pilots of properly equipped aircraft, while NDBs provide nondirectional signals. The Rogue Valley VORTAC, located immediately north of the airport, is depicted on **Exhibit 1F**. Loran-C utilizes a system of transmitters, but varies from VOR in that pilots are not required to navigate using a specific facility. RNAV permits aircraft to operate an any desired path using VOR transmitters, when the aircraft is properly equipped. However, the latest enroute navigational aid available to pilots is GPS.

Initially developed by the U.S. Department of Defense, it is being increasingly used in civilian aircraft navigation. A system of satellites has been deployed to transmit electronic signals which aircraft may in turn use to calculate their relative location. The FAA is proceeding with a program to gradually replace all traditional enroute navigational aids with GPS by the year 2020. A wide area augmentation system (WAAS) is being installed to

meet navigation performance requirements for domestic enroute, terminal, non-precision approach and precision approach flight phases. WAAS is designed to enhance the accuracy, integrity, and availability of GPS signals, contributing to increased aviation system capacity and efficiency. The augmentation improves signal accuracy from 100 meters to less than 10 meters and provides the availability and integrity needed to use GPS signals as the primary means of navigation.

There are a number of other public and private use airports located within the immediate area which have been depicted within the area airspace on **Exhibit 1F**. The vicinity airports do not create any airspace conflicts with MFR.

EXISTING LAND USE, ZONING AND AREA PLANNING

Existing land use in the airport vicinity was examined in detail for the *F.A.R. Part 150 Noise Compatibility Study* in 1986. The study recommended that a number of properties, primarily north of the airport, be acquired for noise compatibility purposes. Many of these properties (although not all) were subsequently acquired. The area around the airport continues to be a mixture of scattered single family residential, industrial/commercial development, and agricultural uses. The density of development is greater on the south end of the airport, towards the city.

Zoning in the immediate vicinity of the airport (which includes jurisdictional areas of both Medford and Jackson County) is depicted on **Exhibit 1G**, which is taken from an exhibit which was included in the *Environmental Assessment for Proposed Improvements, prepared by David Evans and Associates in March 1999*. The AD-MU district was designed to "prevent the establishment of airspace obstructions . . . and to encourage desirable and appropriate land uses for areas located in proximity to major airports" according to the Jackson County *Land Development Ordinance* (1989).

Jackson County also has Airport Approach (AA) and Airport Concern (AC) overlay zones. The AA overlay zone restricts the height of structures or activities that could be a hazard to aircraft taking off or landing. The AA zone is "intended to prevent the establishment of airspace obstructions in air approaches through height restrictions and other land use controls" according to the *Land Development Ordinance*. The AC overlay zone follows *FAR Part 77*. The AA overlay zone regulations supersede those of the underlying zoning designation. The AC overlay zone permits the uses of the underlying zoning district, but prevents airspace obstructions, has height restrictions, and requires a deed declaration to recognize the airport's pre-existence for all single-family dwellings. In the AC overlay zone, a deed declaration is required only if a dwelling is located within the 55 DNL airport noise contour.

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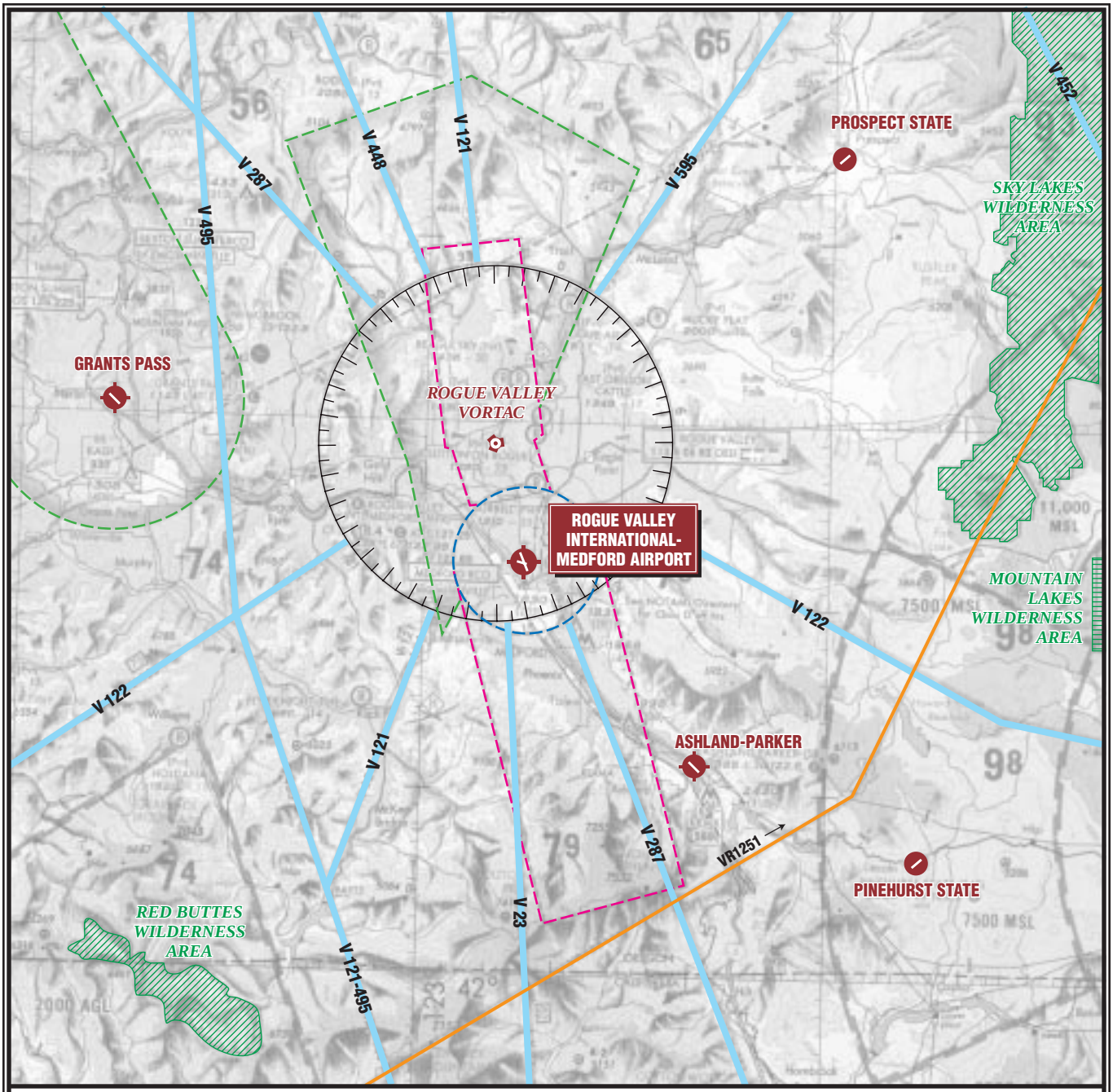

LEGEND

- Airport with hard-surfaced runways 1,500' to 8,069' in length
- VORTAC
- Compass Rose
- Class D Airspace
- Class E Airspace
- Class E Airspace with floor 700' above surface
- Victor Airways
- Military Training Routes

NORTH

NOT TO SCALE

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

JACKSON COUNTY Airport Authority

Exhibit 1F
REGIONAL AIRSPACE

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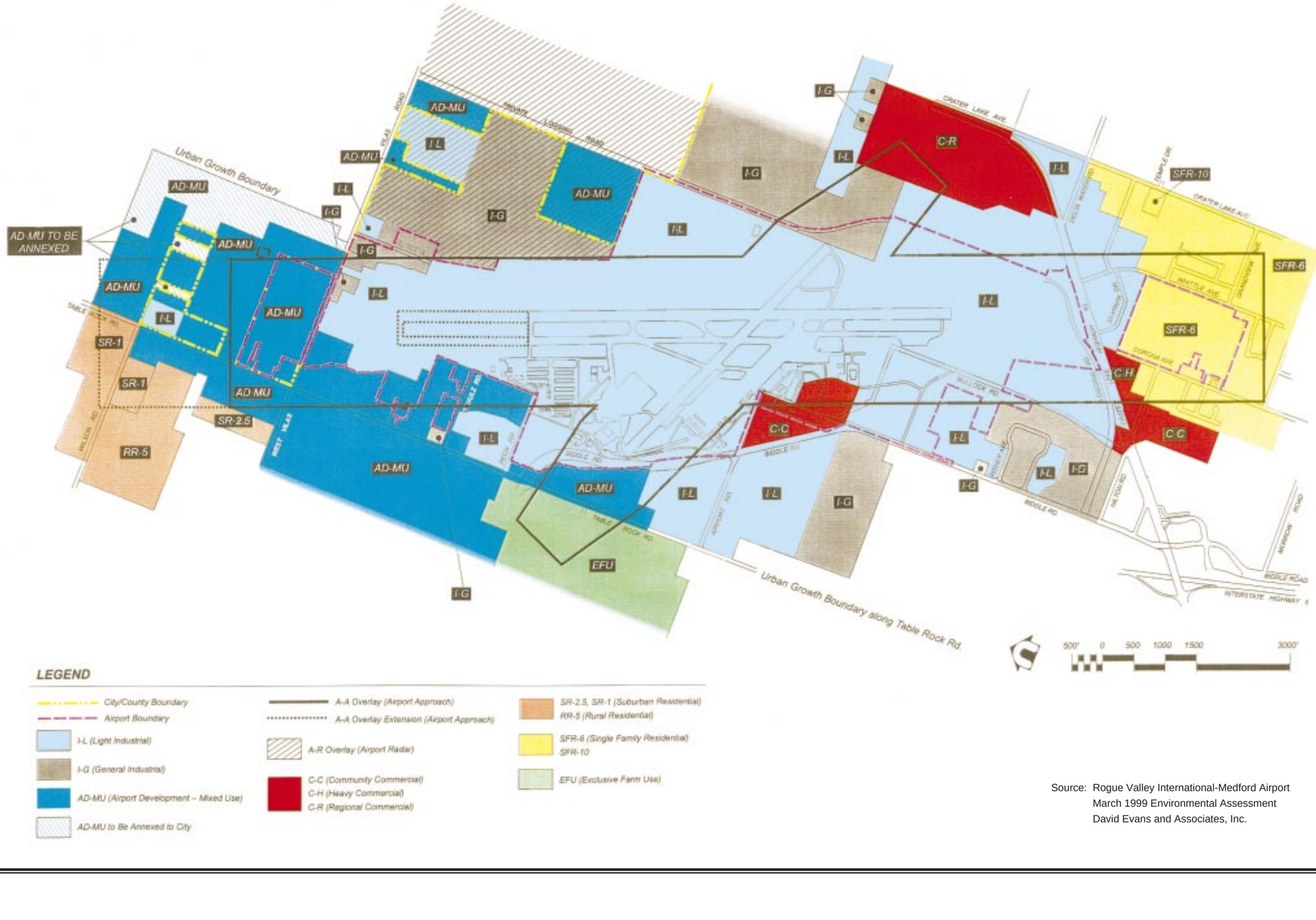

LEGEND

- City/County Boundary
- Airport Boundary
- I-L (Light Industrial)
- I-G (General Industrial)
- AD-MU (Airport Development – Mixed Use)
- AD-MU to Be Annexed to City
- A-A Overlay (Airport Approach)
- A-A Overlay Extension (Airport Approach)
- A-R Overlay (Airport Radar)
- C-C (Community Commercial)
- C-H (Heavy Commercial)
- C-R (Regional Commercial)
- SR-2.5, SR-1 (Suburban Residential)
- RR-5 (Rural Residential)
- SFR-6 (Single Family Residential)
- SFR-10
- EFU (Exclusive Farm Use)

Source: Rogue Valley International-Medford Airport
March 1999 Environmental Assessment
David Evans and Associates, Inc.

JACKSON COUNTY
Airport Authority

Exhibit 1G
ZONING MAP

With regard to other planning studies in the vicinity of the airport, the Oregon Department of Transportation is undertaking a *Highway 62 Corridor Solutions Project* for the portion of Highway 62 (Crater Lake Highway) between Medford and White City. Traffic on this highway has increased over the past few years to the point that it now carries a higher volume than Interstate 5 (through Medford). Any improvements are not expected to begin construction until 2003; however, airport master planning alternatives and/or recommendations will need to be coordinated with potential highway corridor solutions to avoid potential conflicts.

SUMMARY

The information discussed on the previous pages is intended to provide an overview of the airport history, activity levels, existing facilities, and community profiles. It is not intended to be all-inclusive of data which was available or collected to-date for this planning effort. In the following chapters, additional information will be presented to supplement this data in support of planning analyses. Initially, in the development of aviation demand forecasts (Chapter Two), a more comprehensive overview of historical activity statistics will be presented, while in the facility requirements analysis (Chapter Three), summaries of existing terminal functional areas and hangar/ramp storage areas will be presented. The information and data in total will be used to define the airport's ability to accommodate projections of aviation demand.

DOCUMENT SOURCES

A variety of sources were used during the inventory process. The following listing reflects a partial compilation of these sources. In addition, considerable information was provided directly to the consultant by the Rogue Valley International - Medford Airport administration staff on visits to the airport in late June 1999. It should be recognized that operational statistics, airport tenants, and local community profile information continues to change over time. At the conclusion of the planning effort (estimated at nine months), the consultant will update information prior to finalizing the document. The following documents were referenced in the initial preparation of this chapter:

AirNav Airport Information, web site: www.airnav.com

Airport Facility Directory, Northwest U.S., U.S. Department of Commerce, National Oceanic and Atmospheric Administration, July 15, 1999.

Airport Master Plan, Medford-Jackson County Airport, Prepared for Jackson County by The Airport Technology and Planning Group, Inc., September 1993.

Airport Master Plan and Noise Compatibility Study for Medford-Jackson County Airport, Prepared for Jackson County by Coffman Associates, Inc., February 1986.

Aviation Database, web site: www.avweb.com

Draft Environmental Assessment, Rogue Valley International-Medford Airport, Proposed Improvements, Prepared for Jackson County by David Evans and Associates, Inc., March 1999.

FAA Aerospace Forecasts, Fiscal Years 1999-2010, Office of Aviation Policy and Plans, Federal Aviation Administration, March 1999.

FAA Long-Range Aerospace Forecasts, Fiscal Years 2015, 2020, and 2025, Office of Aviation Policy and Plans, Federal Aviation Administration, June 1999.

Federal Aviation Administration, web site: www.faa.gov

G.C.R. & Associates, Inc. web site: www.gcr1.com

Jackson County Airport Authority, *The History of Rogue Valley International-Medford (formerly known as Medford-Jackson County Airport)*, By Hattie B. Becker, 1995.

Klamath Falls Sectional Aeronautical Chart, U.S. Department of Commerce, National Oceanic and Atmospheric Administration.

ORE-CAL Trade Corporation, web site information.

Rogue Valley International - Medford Airport, web site: www.jacksoncounty.org

Southern Oregon Regional Economic Development, Inc. web site: www.soredi.org

State of Oregon, Department of Transportation, web site: www.odot.state.or.us/region3

U.S. Terminal Procedures, Northwest U.S., U.S. Department of Commerce, National Oceanic and Atmospheric Administration, July 15, 1999.

FORECASTS

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

The previous planning efforts conducted at the airport have each included a set of comprehensive forecasts for long-range facility planning. Because aviation activity can be affected by many influences, it is important to remember that forecasts are to serve only as guidelines and that planning must remain flexible enough to respond to unforeseen facility needs. This makes it important to review an airport's activity on a regular basis to determine if changes to the guidelines are necessary.

A good example of this has been the increase in enplaning passengers through the airport over the past five years, and the recent construction of facilities on the airport to serve international markets. These changes can have a dramatic affect on the need for new or improved facilities. Aviation is dynamic, and creates changing needs throughout the system.

Using a broad spectrum of local, regional, and national aviation industry information, the forecasts are developed for the following elements: commercial service passenger enplanements, fleet mix, air freight, air mail, based aircraft, military activity (although this is very insignificant at Medford), peaking characteristics, operations, and annual instrument approaches. The forecasting

analysis begins with a review of trends at the national level.

NATIONAL AVIATION TRENDS

COMMERCIAL AIRLINES

The commercial aviation industry in the United States experienced its fifth consecutive year of traffic growth in 1998. Passenger enplanements grew by 2.1 percent in 1998. This growth was attributed in part to strong U.S. economic growth and to continued economic expansion. However, domestic capacity increased by only 0.6 percent in 1998, resulting in an all-time high load factor of 70.1 percent.

The smaller regionals/commuter industry continued to grow at significantly higher rates than the larger air carriers in 1998, with passenger enplanements increasing by 7.3 percent in 1998. Like their large counterparts, they also achieved an all-time high load factor of 56.5 percent in 1998.

The regional/commuter fleet has continued to be upgraded, with increasing numbers of regional/commuter airlines operating 30 to 75 seat regional jets. The use of these aircraft is expected to continue the greater acceptance of the regional/commuter airlines by the traveling public.

The FAA projections for commercial service and regional/commuter passenger enplanements indicate relatively strong growth. As shown on **Exhibit 2A,** commercial enplanements are projected to grow at an average annual rate of approximately 3.4 percent through the year 2010. Regional/commuter enplanements are projected to grow at an annual average rate of 5.4 percent during the same period.

AIR CARGO

U.S. air carrier's air cargo traffic in 1998 continued to grow at rates close to past trends, with domestic and international revenue ton miles (RTMs) up 4.3 and 7.3 percent, respectively. Cargo freight/express RTMs are forecast to more than double over the next 12 years as moderate to strong economic activity both domestically and internationally fuels the demand for the speedy movement of goods and products by air. The annual rate of growth of freight/express over the 12-year period is 5.6 percent.

Significantly slower growth is forecast for air mail, as electronic alternatives (fax, e-mail, etc.) cut into the volume of mail moved by air. Both domestic and international RTMs are projected to increase at annual rates of 3.5 percent over the forecast period.

The world's air cargo fleet is expected to double in size during the next 20 years, from roughly 1,450 units in 1998 to more than 2,800 units by 2017. There is a trend towards increasing use of wide-body freighters (such as 767s, A310s, A300s, DC-10-30s, MD-11s, and 747s). By 2017, as much as 50 percent of the total freighter fleet is projected to be wide-body. The small freighter fleet

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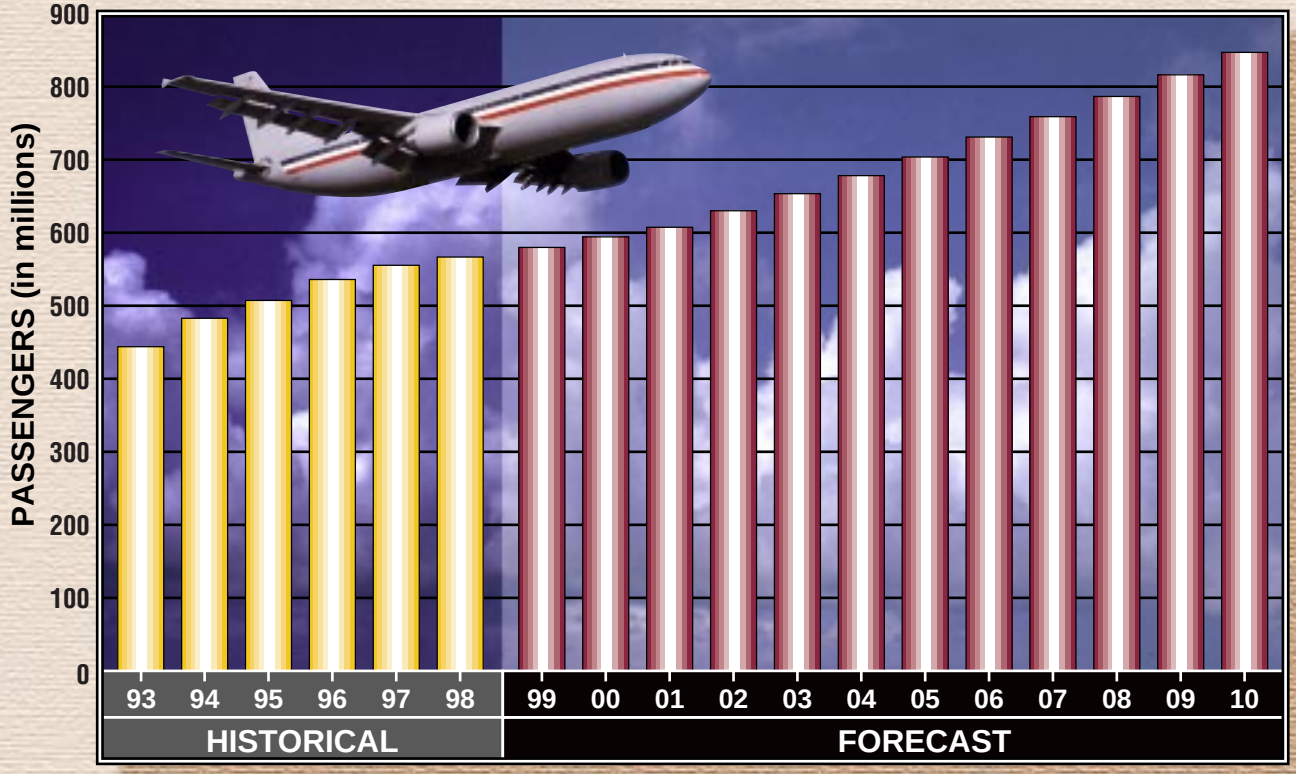
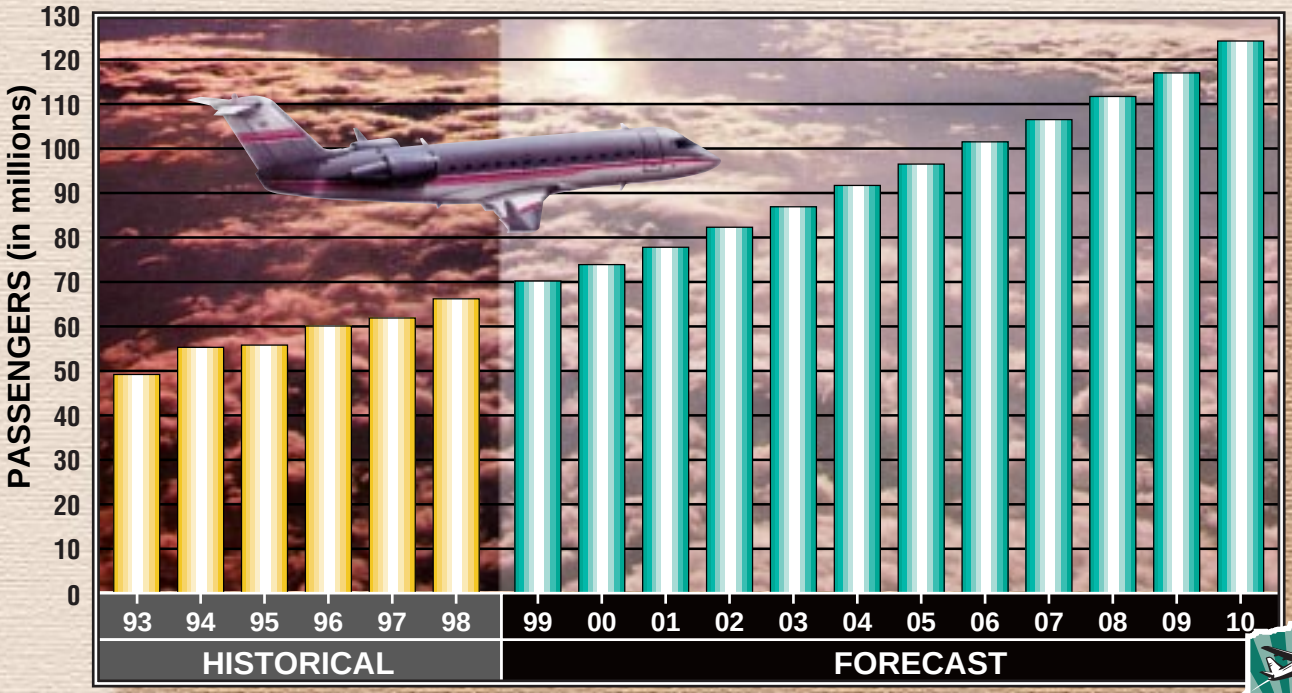
U.S. COMMERCIAL AIR CARRIERS SCHEDULED PASSENGER ENPLANEMENTS



Source: BTS, Form 41, U.S. Department of Transportation/FAA Aviation Forecasts, FY 1999-2010

U.S. REGIONAL/COMMUTER SCHEDULED PASSENGER ENPLANEMENTS



Source: BTS, Form's 298-C and 41, U.S. Department of Transportation/
FAA Aviation Forecasts, FY 1999-2010

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Exhibit 2A
U.S. COMMERCIAL AND
REGIONAL/COMMUTER FORECASTS

continues to be dominated by the 727. These are expected to remain the primary aircraft in the small freighter category for the next decade. After that, the 737-300 and A-320 are expected to receive use in this category. The older DC-8s and 707s in the medium narrow-body category are expected to be phased out over time, but the only newer aircraft which currently fits into this category is the 757-200.

As has been true in the past, converted aircraft (rather than newly built units) will be the primary source of future freighter capacity. In the past couple of years, FedEx undertook a major DC-10-10 conversion program, which resulted in a total of 79 aircraft being converted for their use. More of the same should be expected in the future.

GENERAL AVIATION

The general aviation fleet is projected to total 220,804 in 2010, an increase of almost 26,000 aircraft (1.0 percent annual growth) over the 12-year forecast period. The current forecast assumes that the business use of general aviation aircraft will expand at a more rapid pace than personal use. The more expensive and sophisticated turbine-powered part of the fixed wing fleet is expected to grow at triple the rate of that forecast for the piston aircraft categories. The fleet forecasts have been summarized in **Exhibit 2B**.

The general aviation industry is particularly vulnerable to an economic slowdown or recession. The recent turnaround in the demand for general aviation products and services, tenuous as it is, has occurred during a period of unprecedented economic growth. No one actually knows how the industry or its customers will react to a protracted slowing of demand or an economic recession.

AIRPORT SERVICE AREA

The service area for an airport is defined by its proximity to other airports providing similar services. The closest commercial service airport to Medford is at Klamath Falls, which is 76 miles east of Medford. However, Klamath Falls does not presently have jet service. Of the remaining five commercial service airports in the state, the nearest is Eugene (which has jet service), and is located 167 miles north of Medford. The nearest commercial service on the California side is Redding, approximately 150 miles south of Medford. Therefore, the airport services a sizeable area for scheduled passenger services. It is classified by the FAA as a non-hub facility, enplaning less than 0.5 percent of the national passenger enplanements (which are approaching 600 million).

The general aviation service area is more closely defined, with services available at smaller airfields such as Ashland and Grants Pass. Therefore, for forecasting purposes, registered aircraft will be examined for Jackson County (or a portion of the County), then compared to the levels of based aircraft at MFR.

SOCIOECONOMIC FORECASTS

Local socioeconomic forecasts provide an indication of the potential for sustaining growth in aviation activity over the planning period; therefore, several variables have been examined: population, employment, and per capita income (PCPI). Each of these variables were researched for historical and forecast periods through **The Complete Economic and Demographic Data Source (CEDDS)**, as maintained by Woods & Poole Economics, Washington, D.C.

Historical socioeconomic information has been presented in **Table 2A** for the years 1970, 1980, 1990, 1996, 1998, with forecasts for 2005, 2010, 2015, and 2020.

TABLE 2A
Historical Socioeconomic Data and Projections
Jackson County, Oregon

Year	Total Population	Total Employment	Income Per Capita (1992$)
1970	95,510	36,130	11,336
1980	133,000	58,790	15,120
1990	147,300	76,540	17,443
1996	168,390	92,360	19,508
1998 (Est.)	174,590	97,100	20,268
FORECASTS			
2005	199,220	110,130	22,128
2010	216,880	118,720	23,496
2015	234,930	126,760	24,860
2020	253,050	134,200	26,253

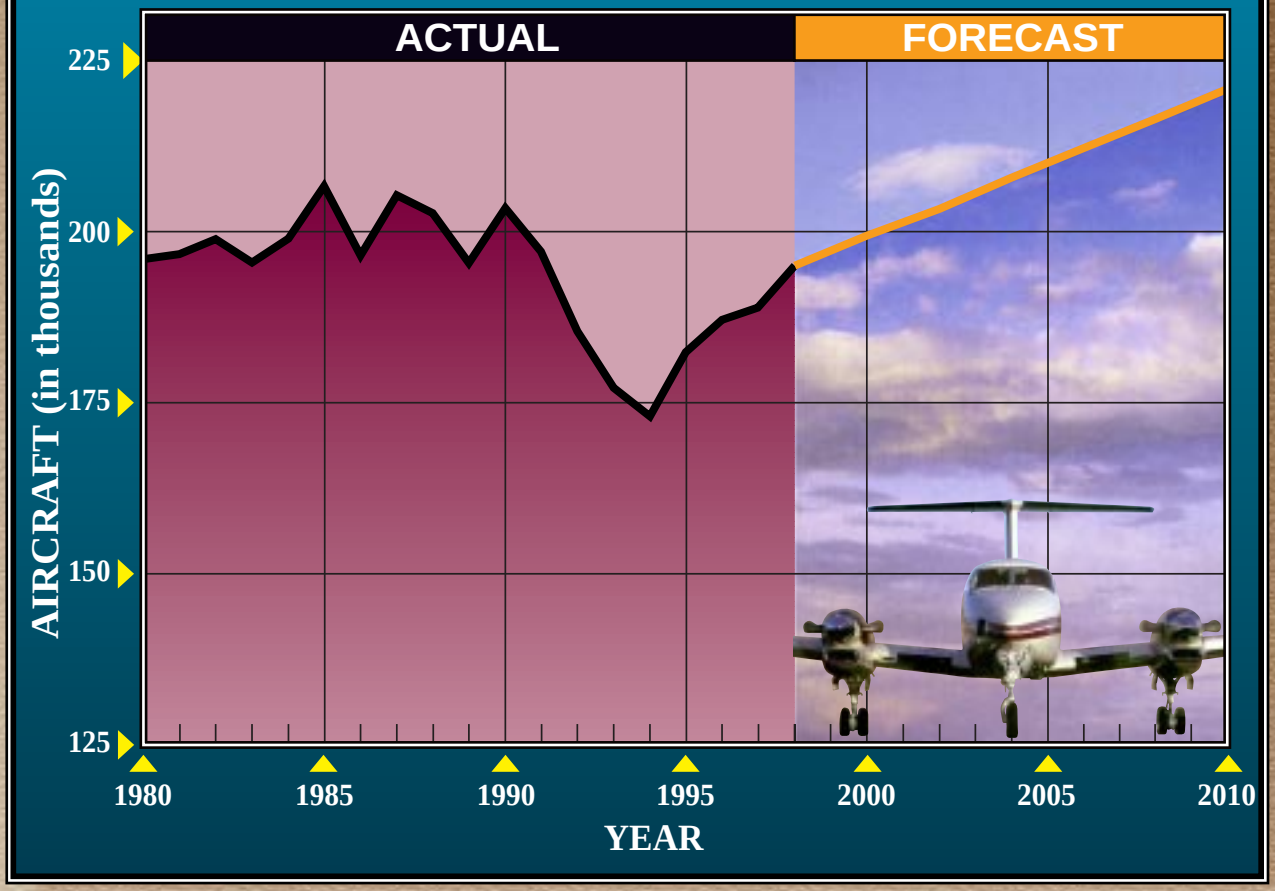
Source: The Complete Economic and Demographic Data Source, Woods & Poole Economics, Inc. 1999.

FORECAST METHODOLOGY

The most reliable approach to estimating aviation demand is through the utilization of one or more analytical techniques. Methodologies frequently considered include: trend line projections, correlation/regression analysis, and market share analysis.

Trend line projections are probably the simplest and most familiar of forecasting techniques. By fitting growth curves to historical data, then extending them into future years, a basic trend line projection can be produced. A basic assumption with this technique is that outside factors will continue to affect aviation demand in

ACTIVE GENERAL AVIATION AIRCRAFT



U.S. ACTIVE GENERAL AVIATION AIRCRAFT (in thousands)

As of Dec. 31, 1998	FIXED WING				ROTORCRAFT				
	PISTON		TURBINE						
	Single Engine	Multi-Engine	Turboprop	Turbojet	Piston	Turbine	Experimental	Other	Total
1998	141.7	16.1	5.7	5.5	2.3	4.6	14.9	4.1	194.8
2000	144.7	16.2	5.8	6.0	2.3	4.7	15.4	4.2	199.3
2002	147.2	16.4	6.0	6.6	2.3	4.8	15.8	4.3	203.3
2004	150.2	16.6	6.2	7.2	2.3	4.9	16.3	4.3	207.9
2006	153.1	16.7	6.3	7.7	2.3	4.9	16.8	4.4	212.2
2008	156.0	16.8	6.5	8.2	2.3	5.0	17.3	4.5	216.5
2010	158.8	16.9	6.6	8.7	2.3	5.2	17.8	4.6	220.8

Source: FAA Aviation Forecasts, Fiscal Years 1999-2010.

Notes: Detail may not add to total because of independent rounding. An active aircraft must have a current registration and it must have been flown at least one hour during the previous calendar year.

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Exhibit 2B
U.S. ACTIVE GENERAL AVIATION
AIRCRAFT FORECASTS

much the same manner as in the past. As broad as this assumption may be, the trendline serves as a reliable benchmark for comparing other projections.

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

In regression analysis, values for the aviation demand element in question, the dependent variable, are projected on the basis of one or more other indicators, the independent variables. Historical values for all variables are analyzed to determine the relationship between the independent and dependent variables. These relationships may then be used, with projected values of the independent variable(s), to project corresponding values of the dependent variable.

Market share analysis involves a historical review of the activity at an airport or airport system as a percentage share of a larger statewide or national aviation market. Trend analysis of this historical share of the market is followed by projection of the share into the future. These shares are then multiplied by forecasts of the activity within the larger geographical area to produce a market share projection. This method has the same limitations as trend line projections, and similarly can provide a useful check on the validity of other forecasting techniques.

Forecasts will be developed in the following sections for the following categories:

- Commercial service.
- Air freight and air mail activities.
- General aviation activities.
- Military activities.
- Peaking characteristics (for commercial and general aviation).
- Annual instrument approaches (all categories).

The forecasts will provide the basis for planning horizon milestones for use in examining aviation facilities development over the planning period.

COMMERCIAL SERVICE FORECASTS

Commercial service activity consists of commercial airlines reporting traffic to the Bureau of Transportation Statistics, U.S. Department of Transportation, on Form 41. The regional/commuter airline industry, providing scheduled service with aircraft having 60 seats or less, report their traffic data to the Department of Transportation, Office of Airline Information, either on DOT Form 298-C or Form 41. Since the traffic statistics are in turn used by the FAA to distribute entitlement funds, the reported enplanement figures have been used in the following analyses (with the exception of 1998 which was not yet available). It should be noted that these figures differ somewhat from figures collected and reported by the airport administration office, although

not by a significant amount. Non-revenue passengers were not included.

To determine the types and sizes of facilities necessary to properly accommodate 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.

PASSENGER ENPLANEMENT FORECASTS

Historical MFR passenger enplanements, U.S. domestic enplanements, U.S. commuter/regional enplanements, and Jackson County population figures were examined for the period since 1990. While the airport did not experience any net growth in enplanements between 1990 and 1994, the average annual growth rate averaged 7.0 percent over the past five years. Over the full eight-year period, the average annual rate of growth was 4.5 percent. A projection of MFR enplanements using an annual growth rate of 4.5 percent was developed, providing the following projections: 2005-297,830; 2010-371,460; 2015-463,300; and 2020-577,850.

If a time series regression analysis is developed of MFR enplanements for 1990-1998, the correlation coefficient is only 0.81, which is not considered to have good predictive reliability (therefore, no forecast was developed). The socioeconomic data was not available on a year-to-year basis, reducing the effectiveness of comparisons against MFR enplanements for regression analysis; therefore, regression-based forecasts using socioeconomic data were not developed.

Market share analysis was undertaken, using two different U.S. variables: total domestic enplanements, and regional/commuter enplanements. As illustrated previously (in **Exhibit 2B**), the regional/commuter segment has grown at a faster pace in this decade.

The market share analysis indicated that MFR's share of the U.S. domestic enplanement market has increased to nearly .04 percent. It's share of the regional/commuter market has also increased over the past five years, but dropped a little in 1998 to .33 percent. Static projections of the market shares were applied against enplanement forecasts developed for *FAA Long-Range Aerospace Forecasts* to provide two market share forecasts. The analysis has been summarized in **Table 2B**.

The Jackson County population was compared to MFR enplanements for enplanement-per-capita ratios. In 1990, the ratio was 1.042. By 1995, it had increased to 1.091, and by 1998 had reached 1.245. Considering that the commercial service area is larger than just Jackson County, it makes sense that the ratio should be greater than 1.0 (a 1:1 ratio is common in small markets if passenger demand is not leaking to competing airports). However, the size of the service area is difficult to define. Assuming it extends equidistant to the nearest commercial service airports, the service area population may be

TABLE 2B
Market Share Forecasts
Rogue Valley International - Medford Airport

Year	Passenger Enplaned (MFR)	U.S. Domestic Enplanements (millions)	Market Share (%)		U.S. Regional Enplanements (millions)	Market Share (%)	
1990	153,503	424.1	.0362		37.2	.413	
1991	140,687	413.3	.0340		38.7	.364	
1992	155,795	430.3	.0362		44.7	.349	
1993	154,626	434.0	.0356		49.2	.314	
1994	152,438	472.1	0.323		55.3	.276	
1995	180,812	496.3	0.364		55.8	.324	
1996	180,964	524.5	0.345		60.0	.302	
1997	213,126	543.0	0.393		61.6	.346	
1998	218,593	554.6	.0394		66.1	.331	
FORECASTS							
				MFR Projection			**MFR Projection**
2005		688.6	.04	275,440	97.6	.33	322,080
2010		828.0	.04	331,200	123.8	.33	408,540
2015		978.7	.04	391,480	151.3	.33	499,290
2020		1,129.0	.04	451,600	180.6	.33	595,980

estimated at 320,000 (this assumes Jackson, Josephine, Curry and a portion of Douglas Counties in Oregon, and a portion of Siskiyou County in California). With population projected to increase by nearly 50 percent in Jackson County by 2020, it has been assumed that the per capita ratio will continue to increase with greater population in the service area. The per capita ratio has been projected at 1.35 in 2005, 1.4 in 2010, 1.45 in 2015, and 1.5 in 2020. This has provided forecasts of MFR enplanements as follows: 2005-268,950; 2010-304,200; 2015-340,840; and 2020-379,300. The analysis has been summarized in **Table 2C**.

Each of the forecast scenarios have been summarized in **Table 2D**. The per-capita analysis has been used to define the preferred forecast since it reflects population growth in the area and an increasing propensity to fly. The preferred forecast represents an average annual growth rate of 2.5 percent. The projections have also been summarized on **Exhibit 2C**, where they are also compared against the FAA's *Terminal Area Forecast*. Subsequent planning will be based upon planning activity levels (rather than a specific year), which will allow the airport to plan facility improvements based upon actual need.

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 has been developed after reviewing

current schedule information, the carriers serving the airport, and the new aircraft being purchased by these carriers. Since the possibility exists for new carriers to enter the market, the fleet mix composition may assume aircraft in seating ranges which do not currently serve the airport.

TABLE 2C
Enplanements - Per-Capita Analysis
Rogue Valley International - Medford Airport

Year	MFR Enplanements	Jackson County Population	Enplanements Per Capita
1990	153,503	147,310	1.042
1995	180,812	165,690	1.091
1998	218,593	175,590	1.245
FORECASTS			
2005	268,950	199,220	1.35
2010	303,630	216,880	1.40
2015	340,650	234,930	1.45
2020	379,300	253,050	1.50

TABLE 2D
Summary of Passenger Enplanement Forecasts
Rogue Valley International - Medford Airport

		FORECAST		
Description	**2005**	**2010**	**2015**	**2020**
Average Growth Rate (4.5%)	297,830	371,460	463,300	577,850
Market Share (U.S. Domestic)	275,440	331,200	391,480	451,600
Market Share (U.S. Regional)	322,080	408,540	499,290	595,980
Increasing Per Capita Based (Preferred Forecast)	268,950	303,630	340,650	379,300
FAA Terminal Area Forecast	259,958	300,763	341,566	----

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. These

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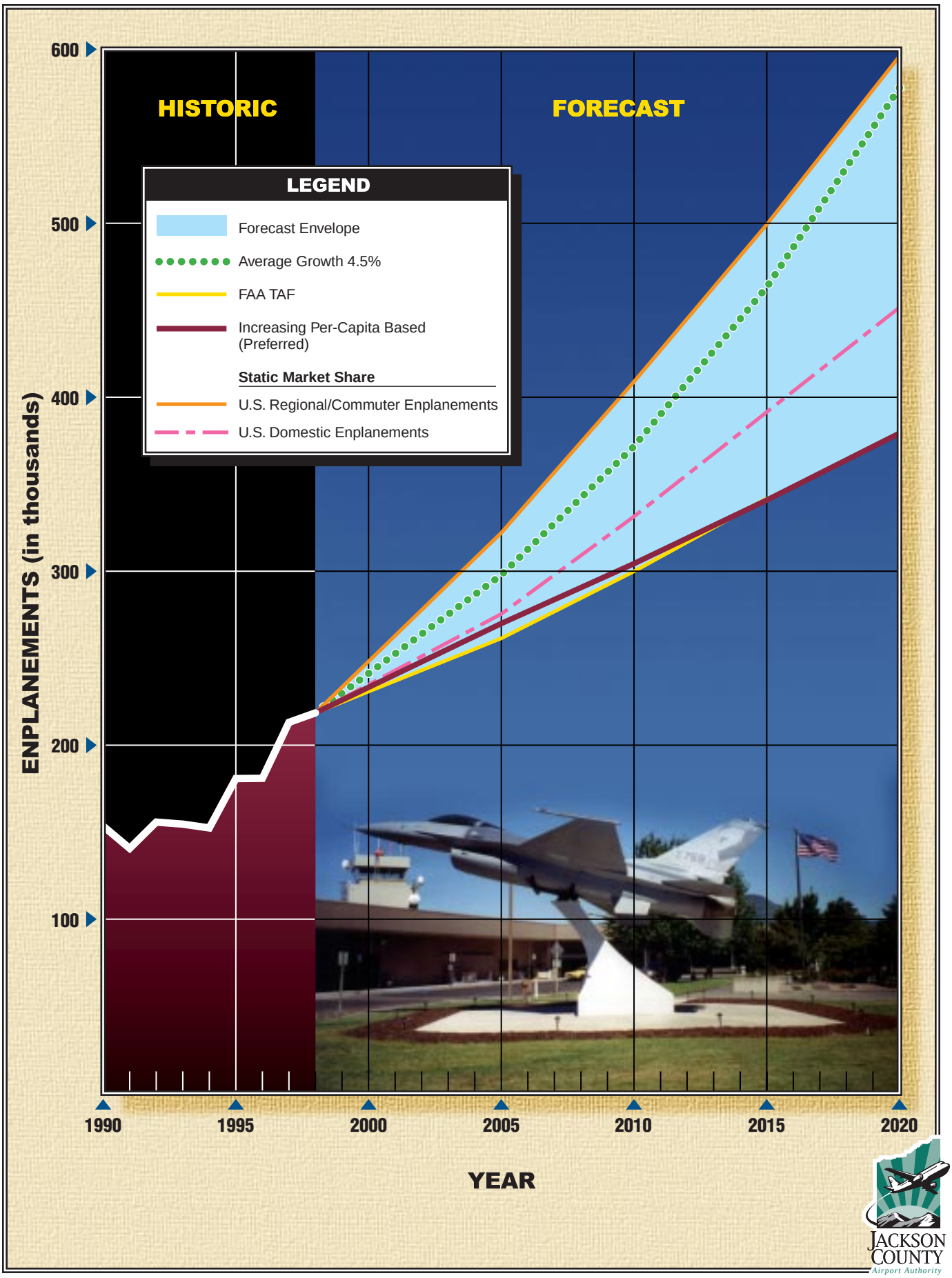

JACKSON COUNTY
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Exhibit 2C
ANNUAL PASSENGER
ENPLANEMENT FORECASTS

aircraft have greater seating capacity, stand-up headroom, and lower operating costs. A good example of this transition is the decision by Horizon Air to purchase up to 70 Dash 8-200/300 aircraft and 25 70-seat regional jets. The CRJ 700 will replace Horizon's Fokker 4000 regional jets. The FAA views the introduction of regional jets as the most significant change in the composition of the future regional/ commuter fleet. The seating capacity of various regional jets currently being manufactured ranges from 35 to 70 seats, with new models being introduced which will expand this seating range even further.

The United Express carrier (SkyWest) has committed to additional Embraer Brasilia aircraft in their future fleet mix, and is also adding up to 50 Canadair Regional Jets. United Airlines flys the B737-200/300/500 series in several seating configurations. While they also fly larger jets (A320s, B757, 767, and 777) in their system, the larger aircraft are not expected to serve the local market.

The long-term outlook in fleet transition is dependent on traffic growth, technological improvements, and airfield facilities which can meet aircraft demands. The fleet mix projections which have been developed reflect a transition into slightly higher percentages of jets with seating capacities above 105 seats, and a transition into a more diverse group of regional turboprops and jets, especially in the 40-80 seat range. The fleet mix projections presented in **Table 2E** reflect an increase in the average seats per departure, with modest adjustments to boarding load factor and the number of enplanements per departure.

AIR FREIGHT AND AIR MAIL FORECASTS

Air freight is handled at the airport by both all-cargo carriers and the scheduled airlines, while air mail is handled only by the latter. Two companies, Ameriflight and Empire Airlines, contract with the all-cargo companies-- FedEx, United Parcel Service, and Airborne – to provide services using a combination of small turboprop and jets for transport of air freight. Empire Airlines has been using the Cessna 208 Caravan exclusively for FedEx the past year. The mix of aircraft used by Ameriflight for the other two carriers has included the Beech Airliners (1900C, B99 and C99), Cessna 402, Lear 35A, Piper Chieftain, and the Metroliner. Each of the aircraft in the all-cargo fleet have gross weights not exceeding 16,000 pounds.

Based upon landing report information collected by the airport administration office for the past year, the all-cargo carriers performed 5800 operations on an annual basis (these operations are reported by the airport traffic control tower in the air taxi category). Total pounds of freight loaded onto aircraft was 3,065,587 pounds, while 3,818,753 pounds was taken off aircraft. In addition, the scheduled airlines handled 332,198 pounds of freight onto aircraft,

while unloading 543,643 pounds. Altogether, there was 7,760,181 pounds of freight reported by airlines moving in and out of the airport in 1998.

TABLE 2E
Airline Fleet Mix and Operations Forecast
Rogue Valley International - Medford Airport

Seating Range	1998	2005	2010	2020
> 130	—	2%	3%	5%
105-129	15.9%	15%	15%	15%
81-104	—	—	5%	10%
40-80	—	10%	15%	20%
< 40	85.1%	73%	62%	50%
Seats per Departure	49.7	50.3	54.2	57.8
Boarding Load Factor	0.60	0.57	0.58	0.60
Enplanements per Departure	29.8	28.7	31.4	34.7
Annual Enplanements	218,593	260,000	300,000	380,000
Annual Departures	7,332	9,060	9,550	10,950
Annual Operations	14,664	18,120	19,100	21,900

Future levels of air freight and air mail will always be sensitive to the contracts which individual carriers may have from time to time with companies in the Medford area. However, several factors should be taken into consideration with regard to future growth. First, the potential for generating significant growth in air freight is enhanced with the on-going developments on the east side of the airfield in conjunction with the international port of entry. The port of entry offers excellent location, expeditious customs, unrestricted and secure operations, fast transfers, and low cost. This should provide the opportunity for enhanced growth in freight throughout the forecasting period. In addition, as reported earlier in this chapter, air freight and express shipments are expected by the FAA to double over the next twelve years, with annualized growth rates over five percent. Air mail is not expected to increase as rapidly, since electronic alternatives will cut into the volume of mail moved by air.

It should be noted that the amount of air freight moving through the airport in the mid-80s was reported to be only 1.4 million total pounds. By 1993, carriers reported (to the Department of Transportation) that 3.9 million enplaned pounds (approximately 8.0 million total pounds) moved through the airport. Therefore, the growth which the airport has experienced through the remainder of the 90s appears to be relatively unchanged, although reporting methods employed by the cargo carriers have not always been consistent over the past twenty years. Growth rates projected by the FAA have been applied to existing air freight and air mail volumes, to achieve

planning projections which reflect a gradual "phasing in" of facilities on the east side of the airport, and continuing development of markets in Southwest Oregon and Northwest California by the all-cargo carriers and scheduled airlines. An annualized growth rate of 5.6 percent has been applied to air freight, while an annualized growth rate of 3.5 percent has been applied to air mail. The forecasts have been summarized in **Table 2F**.

TABLE 2F
Air Freight And Air Mail Forecasts
Rogue Valley International-Medford Airport

Year	Air Freight On	Air Freight Off	Air Mail On	Air Mail Off	Total Air Freight and Mail
1998	3,397,785	4,362,396	678,770	27,569	8,466,520
FORECAST					
2005	4,980,000	6,390,000	864,000	35,000	12,269,000
2010	6,540,000	8,390,000	1,026,000	42,000	15,998,000
2020	11,280,000	14,470,000	1,450,000	59,000	27,259,000

The fleet mix is expected to transition to jets, although the type and frequency will vary based upon demands by individual carriers and the international port of entry. Annual operations by all-cargo operators are projected to increase at an annualized growth of only 2.0 percent, reflecting use of larger aircraft and higher payload capacity.

MEDFORD AIRTANKER BASE OPERATIONS FORECAST

Landing fee reports were reviewed for the past three fire seasons to gauge the variation in airtanker activity at the airport. The following totals have been reported: 1996--277 landings, 1997--24 landings, and 1998--150 landings. A number of different types of airtankers are used: the Douglas DC-6/7, Lockheed C-130, and P-3A, are typical of the larger airtankers. Consistent with the *National Interagency Airtanker Study* undertaken in 1995, the fleet will be replaced entirely with C-130 aircraft in the near future. Operations recorded at the airport vary with the intensity of the fire season; therefore, an average of the three years, 150 annual landings (300 annual operations), has been used for forecasting purposes.

MILITARY OPERATIONS FORECAST

There were 340 itinerant and 224 local operations recorded by the airport traffic control tower in the military category in 1998. This is consistent

with 1997, when 402 itinerant and 190 local operations were recorded. Projected activity is not expected to vary much from these levels, therefore a static projection of 375 annual itinerant and 200 annual location operations will be used for the forecasts.

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 include: based aircraft, fleet mix, and annual operations.

BASED AIRCRAFT AND FLEET MIX PROJECTIONS

Based aircraft is the most basic of the general aviation demand indicators. By first developing a forecast of based aircraft, the growth of other general aviation activities can be projected. The latest update of the FAA Form 5010-1, *Airport Master Record* (July 15, 1999) reported a total of 204 fixed wing aircraft and four helicopters based on the field. Individual fixed base operators were surveyed, and hangar tenant lists and tie-down records maintained by the airport administration office were reviewed to verify the based aircraft figure. While the type of aircraft stored in some hangars was not available, the information that was gathered appeared to substantiate a number of only 150 aircraft and helicopters that are actually based on the field. There are several operators, such as Erickson Air Crane, that are operating aircraft and helicopters through the facility on a regular basis, but do not actually base the craft at the airport. The total of 150 compares to 138 that were reported in 1991, at the time the last master plan was prepared. Aircraft that operate on the airfield for only a limited period of the year, such as the Forest Service airtankers, are not included in the based figure.

To review the number of registered aircraft in the local area, and the share of this market area that are based at the local airport, the registered aircraft in the local Medford zip code areas (97501-04) were examined. Based upon registration information available through mid-1999, there are 375 aircraft registered in the Medford area. Therefore, the airport is capturing 40 percent of the aircraft registered locally.

The FAA is projecting 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 FAA is recording an increase in operations at enroute traffic control centers. The continued use of general aviation aircraf for business and corporate uses is a trend which is expected to continue in the future.

The projection for based aircraft has been developed using a static market share projection of registered aircraft in the local area, using the growth rates

projected by the FAA in active aircraft. The based aircraft at the airport have been projected at a static percentage of the registered aircraft in the four zip codes areas for the Medford area. The analysis has been summarized in **Table 2G**. The 20-year projection reflects an increase from 150 to 184 aircraft.

TABLE 2G
Registered and Based Aircraft Forecast

Year	U.S. Active Aircraft	Medford Registered Aircraft	(%)	MFR Based Aircraft	(%)
1991	198,000	N/A		138	
1992	198,500	N/A		N/A	
1993	177,119	267	(.151)	N/A	
1994	172,936	328	(.190)	N/A	
1995	188,089	357	(.190)	N/A	
1996	191,129	349	(.183)	N/A	
1997	192,414	348	(.181)	N/A	
1998	194,826	367	(.188)	N/A	
1999	197,271	375	(.190)	150	(.40)
FORECAST					
2005	210,029	400	(.190)	160	(.40)
2010	220,804	420	(.190)	168	(.40)
2020	240,300	460	(.190)	184	(.40)

Sources: FAA Aerospace Forecasts, FY 1999-2010 (U.S. Active Aircraft); U.S. Registered Aircraft, Aviation Goldmine, Software Innovations; Based aircraft counts for 1991 and 1999 based upon field counts.

The fleet composition is expected to continue to transition to greater percentages of turboprop, turbofan, and helicopters in the mix, consistent with national and local trends. The fleet mix projection has been presented in **Table 2H**, and has also been summarized on **Exhibit 2D**.

ANNUAL OPERATIONS PROJECTIONS

There are two types of general aviation operations at the 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 than personal use aircraft.

TABLE 2H
Based Aircraft and Fleet Mix Forecast

Year	Total Aircraft	Single Engine	Multi Engine	Jet	Helicopter
1991	138	104	27	6	1
1999	150	124	15	7	4
FORECAST					
2005	160	128	17	9	6
2010	168	129	20	11	8
2020	184	132	25	15	12

Typically, operations per based aircraft ratios can range from 300 to 800 at airports similar to MFR. If the airport is subject to above normal training activity, then the ratio will likely fall at the upper end of this range. In 1991, the utilization ratio for MFR was 500, while in 1998 it had dropped to 340. It actually had declined soon after operational levels declined in 1993, and has generally stayed in a range close to the current level. With FAA projecting increasing hours flown by general aviation aircraft in the next decade, it is reasonable to assume that there will also be a resulting increase in utilization rates at MFR. Therefore, in forecasting future general aviation activity levels, it has been assumed that the operations per based aircraft ratio will increase from 340 to 375 through the planning period. Since the level of local and itinerant activity is equivalent, the forecasts assume a 50/50 distribution, as summarized in **Table 2J**.

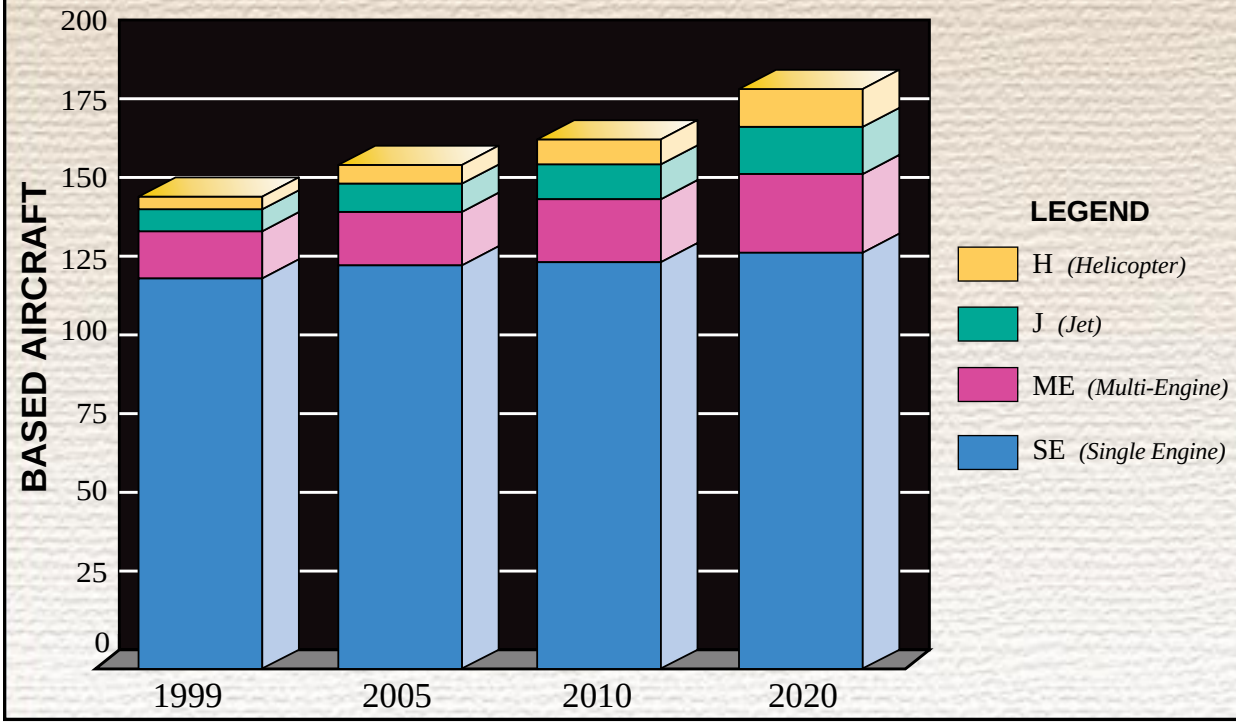
PEAKING CHARACTERISTICS

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.

99MP08-2D-9/9/99

BASED AIRCRAFT



PERCENT BY AIRCRAFT TYPE

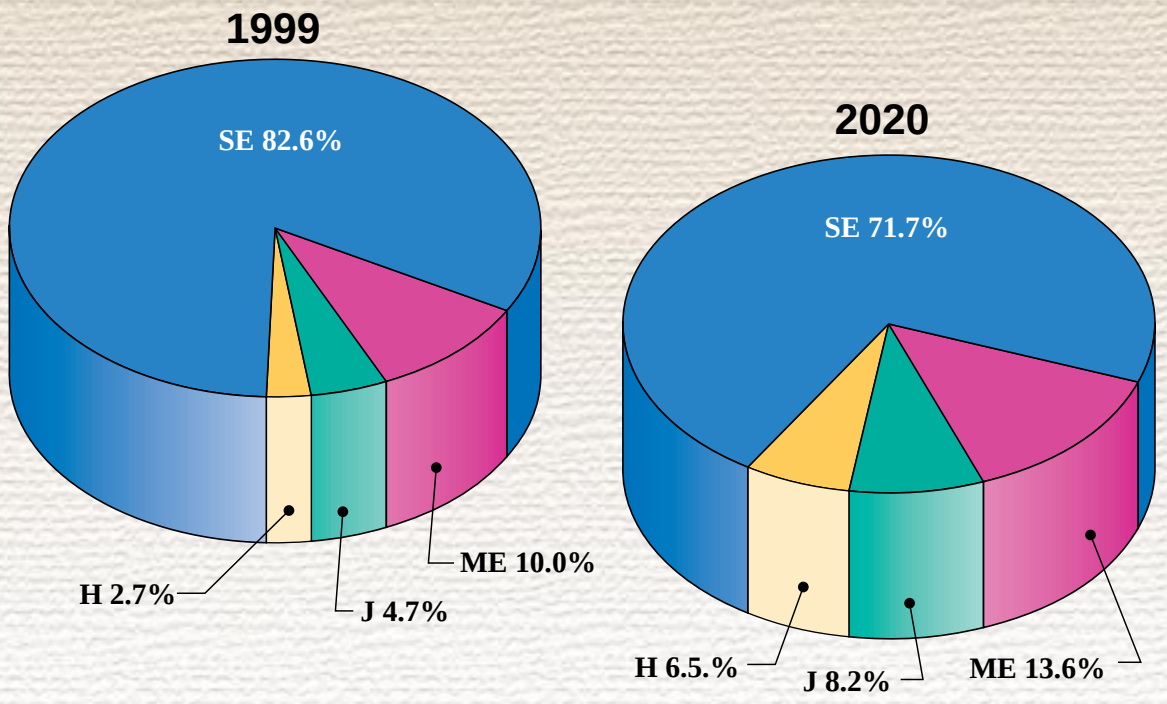


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Exhibit 2D
BASED AIRCRAFT FLEET MIX FORECAST

TABLE 2J
Forecast Of General Aviation Operations

Year	Total G.A. Operations	Itinerant Operations	Local Operations
1990	70,810	39,778	31,032
1991	67,841	37,360	30,481
1992	70,860	39,738	31,122
1993	54,513	31,891	22,622
1994	63,104	33,710	29,394
1995	48,690	25,744	22,946
1996	50,727	27,227	23,500
1997	52,664	27,393	25,271
1998	51,523	26,133	25,390
FORECAST			
2005	56,000	28,000	28,000
2010	60,000	30,000	30,000
2020	69,000	34,500	34,500

It is important to note that only the peak month is an absolute peak within a given year. All of the other peaking factors will be exceeded at various times during the year. However, they are considered to be reasonable planning standards than can be applied to future facility needs.

The peak month for passenger enplanements in 1998 was August, with 10.4 percent of the annual total. This factor has been applied to forecasts of annual enplanements. The design hour has been estimated at 25 percent of the design day enplanements, upon review of current schedules and available outbound seats during the busiest hour. Peak airline operations were also based upon the current distribution of flights through the day.

The peak month for general aviation operations was also in August, with 13 percent of the annualized activity. The forecast of busy day operations was calculated at 1.25 times design day activity. Design hour operations were estimated at 15 percent of design day. **Table 2K** summarizes the peak period forecasts for MFR.

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".

TABLE 2K
Peak Period Forecasts

	Actual 1998	FORECASTS 2005	2010	2020
Airline Enplanements				
Annual	218,593	260,000	300,000	380,000
Peak Month (10.4%)	22,730	27,040	31,200	39,520
Design Day (P.M./30)	760	900	1,040	1,320
Design Hour (25%)	190	225	260	330
Airline Operations				
Annual	14,664	18,120	19,100	21,900
Peak Month (8.5%)	1,250	1,540	1,620	1,860
Design Day (P.M./30)	42	51	54	62
Design Hour	7	8	9	10
General Aviation Operations				
Annual	51,299	56,000	60,000	69,000
Peak Month (13%)	6,682	7,280	7,800	9,000
Busy Day (1.25 x D.D.)	280	300	325	370
Design Day (P.M./30)	220	240	260	300
Design Hour (15%)	33	36	40	45

For MFR, historical data was obtained from records maintained by the FAA on their web site. The data is recorded for calendar years, and by air carrier, air taxi, general aviation, and military categories. The information for 1997 was incomplete; therefore, it was omitted. The AIAs for each category in 1998 were examined as a percentage of total operations in each category, then projected using the forecasts which have been developed for air carrier, air taxi, general aviation, and military activity. The forecasts are summarized in **Table 2L**.

FORECAST SUMMARY

This chapter has outlined the various aviation demand levels anticipated over the planning period. Long-term aviation growth at MFR will be sustained by continuing growth in the local economy, increasing use of the foreign trade zone, and the strengthen-

ing of the general aviation segment. 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 2E**.

TABLE 2L
Forecast of Annual Instrument Approaches

Year	Air Carrier	Air Taxi	General Aviation	Military	Total
1995	214	1,325	776	9	2,324
1996	84	952	520	9	1,565
1997	*Incomplete data was reported for 1997*				
1998	203	1,827	801	19	2,850
FORECAST					
2005	330	1,900	900	20	3,150
2010	380	1,940	960	20	3,300
2020	820	2,300	1,100	20	4,240

Source: Federal Aviation Administration, 1995-1998 data.

ADDENDUM:

Prior to finalization of the master plan in February 2001, actual enplanements for calendar years 1999 and 2000 were reviewed and compared against the 1998 base year and short term forecasts. Actual enplanements in 1999 were 224,699, increasing to 235,575 in 2000. The trend line is staying very close to the planning forecast included in the plan and approved by the FAA. Total annual operations have remained near 70,000.

	ACTUAL	FORECASTS		
	1998	2005	2010	2020
Passenger Enplanements	218,593	260,000	300,000	380,000
Annual Operations				
Passenger Airlines	14,664	18,120	19,100	21,900
General Aviation - Total	51,523	56,000	60,000	69,000
Itinerant	26,133	28,000	30,000	34,500
Local	25,390	28,000	30,000	34,500
Misc. Air Taxi	3,466	4,000	4,500	5,500
Military - Total	564	575	575	575
Itinerant	340	375	375	375
Local	224	200	200	200
Total Airport Operations	70,217	78,695	84,175	96,975
Air Freight and Air Mail (pounds)				
Freight On	3,397,785	4,980,000	6,540,000	11,280,000
Freight Off	4,362,396	6,390,000	8,390,000	14,470,000
Air Mail On	678,770	864,000	1,026,000	1,450,000
Air Mail Off	27,569	35,000	42,000	59,000
Based Aircraft (Civilian)				
Total Aircraft	150	160	168	184
Single-Engine	124	128	129	132
Multi-Engine	15	17	20	25
Jet	7	9	11	15
Helicopter	4	6	8	12

JACKSON COUNTY
Airport Authority

Exhibit 2E
AVIATION FORECASTS SUMMARY

AVIATION FACILITY REQUIREMENTS

To properly plan for the future of Rogue Valley International - Medford Airport, it is necessary to translate forecast aviation demand into the specific types and quantities of facilities that can adequately serve this identified demand. This chapter uses the results of the forecasts conducted in Chapter Two, as well as established planning criteria, to determine the airfield (i.e., runways, taxiways, navigational aids, marking and lighting), and landside (i.e., hangars, terminal building, cargo buildings, aircraft parking apron) facility requirements.

The objective of this effort is to identify, in general terms, the adequacy of the existing airport facilities, outline what new facilities may be needed, and when these may be needed to accommodate forecast demands. Having established these facility requirements, alternatives for providing these facilities will be evaluated in Chapter Four to determine the most cost-effective and efficient means for implementation.

Recognizing that the need to develop facilities is determined by demand, rather than a point in time, the requirements for new facilities have been expressed for the short, intermediate, and long term planning horizons, which roughly correlate to five-year, ten-year, and twenty-year time frames. Future facility needs will be related to these activity levels rather than a specific year. **Table 3A** summarizes the activity levels that define the planning horizons used in the remainder of this master plan.

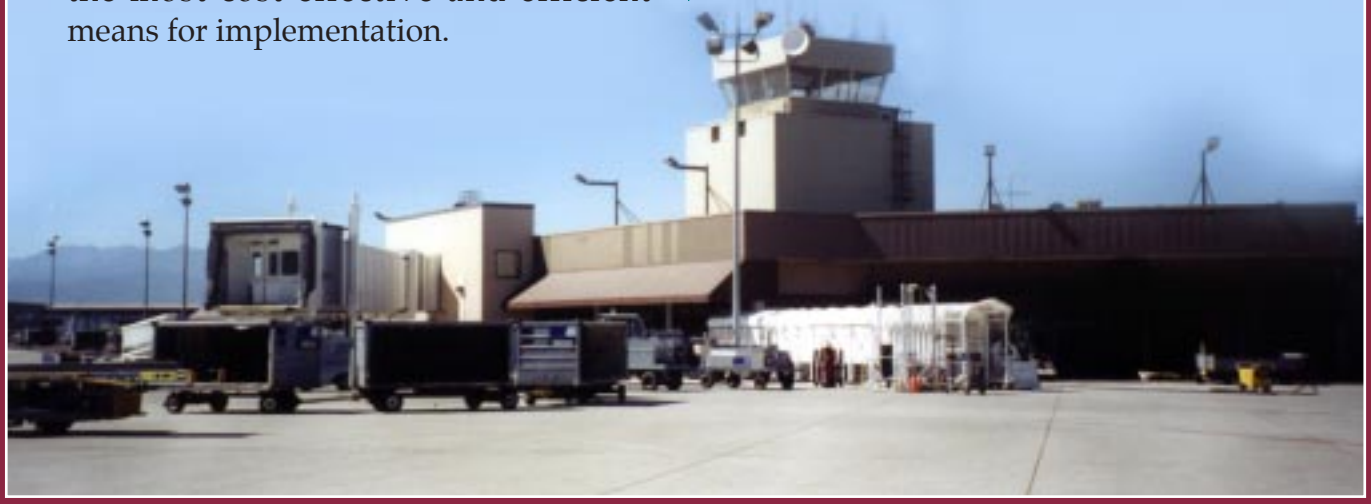

TABLE 3A
Planning Horizon Activity Levels

	Short Term Planning Horizon	Intermediate Term Planning Horizon	Long Term Planning Horizon
Passenger Enplanements	290,000	350,000	500,000
Enplaned Air Cargo (lbs.)	4,980,000	6,540,000	11,280,000
Based Aircraft	160	168	184
Annual Operations	80,775	87,275	103,875

AIRFIELD REQUIREMENTS

Airfield requirements include the need for those facilities related to the arrival and departure of aircraft. These facilities are comprised of the following items:

- Runways
- Taxiways
- Navigational Aids
- Airfield Marking and Lighting

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.

AIRFIELD DESIGN STANDARDS

The selection of appropriate FAA design standards for the development and location of airport facilities is based primarily upon the characteristics of the aircraft which are currently using, or are expected to use the airport. Planning for future aircraft use is of particular importance since design standards are used to plan separation distances between facilities. These standards must be determined now since the relocation of these facilities will likely be extremely expensive at a later date.

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

According to FAA Advisory Circular (AC) 150/5300-13, *Airport Design*, an aircraft's approach category is based upon 1.3 times its stall speed in landing configuration at that aircraft's maximum certificated weight. The five approach categories used in airport planning are as follows:

Category A: Speed less than 91 knots.

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

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

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

Category E: Speed greater than 166 knots.

The airplane design group (ADG) is based upon the aircraft's wingspan. The six ADG's used in airport planning 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.

In order to determine facility requirements, an ARC should first be determined, then appropriate airport design criteria can be applied. This begins with a review of the type of aircraft using and expected to use Rogue Valley International - Medford Airport. **Exhibit 3A** summarizes representative aircraft by ARC.

Rogue Valley International - Medford Airport currently accommodates a wide variety of civilian aircraft use. Aircraft using the airport include small single and multi-engine aircraft (which fall within approach categories A and B and airplane design group I) and business turboprop, and jet aircraft (which fall within approach categories B, C, and D and airplane design group II). The airport is also used by transport jet aircraft (737 type) for transporting passengers and large turboprops (C-130 types) for fire suppression. These aircraft fall within approach category C and airplane design groups III and IV.

The future civilian fleet mix is expected to include a greater number of aircraft operations by transport aircraft such as the Boeing 737 (various types), and Regional Jets in passenger service. Future Foreign Trade Zone (FTZ) activities could initially include 727, 757, or A310 aircraft, and potentially include DC-10/MD-11 aircraft, which fall within ARC D-IV or 747 aircraft, which fall within D-V. The airport is also expected to serve a growing number of business jet operations, which commonly have approach speeds in Categories C and D.

Large transport aircraft are the critical aircraft for defining airfield design standards. The previous master plan included a recommendation to plan airfield elements to ARC C-IV standards. Considering the existing and future fleet mix, airfield elements should follow ARC D-IV design standards (even though the higher approach speed category has no impact on design standards). ARC D-IV accommodates the approach speed

requirements of business jets and the wingspan requirements of large transport aircraft.

The design of taxiway and apron areas should consider the wingspan requirements of the most demanding aircraft to operate within that specific functional area on the airport. The terminal area should consider ADG III requirements to accommodate typical transport jet aircraft. General aviation areas should consider ADG II requirements to accommodate the full range of business jet aircraft. Future FTZ facilities should follow ADG IV or V design standards. The Forest Service ramp should also follow ADG IV design standards.

RUNWAYS

The adequacy of the existing runway system at Rogue Valley International-Medford Airport has been analyzed from a number of perspectives, including airfield capacity, runway orientation, runway length, and pavement strength. From this information, requirements for runway improvements have been determined for the airport.

AIRFIELD CAPACITY

An airport's airfield capacity is expressed in terms of its annual service volume. Annual service volume is a reasonable estimate of the maximum level of aircraft operations that can be accommodated in a year. Annual service volume accounts for annual differences in runway use, aircraft mix, and weather conditions. The airport's annual service volume was examined utilizing FAA Advisory Circular (AC) *150/5060-5, Airport Capacity and Delay*.

Factors Affecting Annual Service Volume

Exhibit 3B graphically presents the various factors included in the calculation of an airport's annual service volume. These include: the airfield characteristics, meteorological conditions, aircraft mix, and demand characteristics (aircraft operations). These factors are described below.

Airfield Characteristics

The layout of the runways and taxiways directly affects an airfield's capacity. This not only includes the location and orientation of the runways, but the percent of time that a particular runway or combination of runways is in use and the length, width, weight bearing capacity, and instrument approach capability of each runway at the airport. The length, width, weight bearing capacity, and instrument approaches available to a runway determine which type of aircraft may operate on the runway and if operations can occur during poor weather conditions.

- **Runway Configuration**

The existing runway configuration consists of two intersecting runways, with the shorter runway limited to

A-I

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

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

B-II
less than 12,500 lbs.

Super King Air 200
Cessna 441
DHC Twin Otter

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

A-III, B-III

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

C-I, D-I

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

C-II, D-II

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

C-III, D-III

B 727-200
B 737-200
B 737-300, 400, 500
DC-9
Fokker 70, 100
MD-80
A320

C-IV, D-IV

B-757
B-767
DC-8-70
DC-10
MD-11
L1011

D-V

B-747 Series
B-777

Note: Aircraft pictured is identified in bold type.

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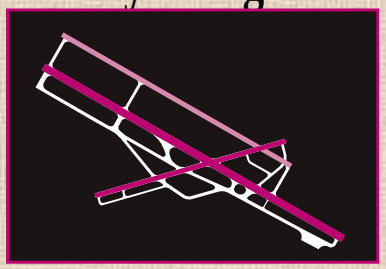
Exhibit 3A
AIRPORT REFERENCE CODES

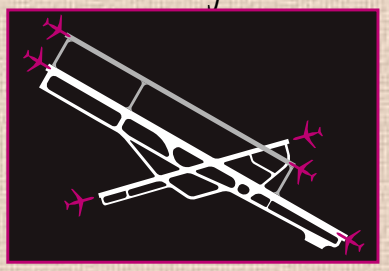
99MP08-3B-10/22/99

AIRFIELD LAYOUT

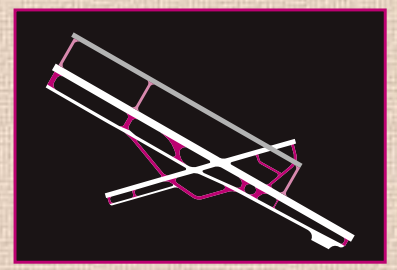
Runway Configuration



Runway Use



Number of Exits



WEATHER CONDITIONS

VFR

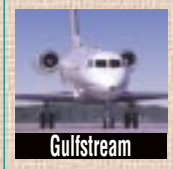
IFR

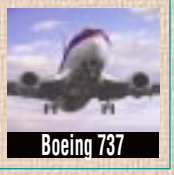
PVC

AIRCRAFT MIX

A&B

C

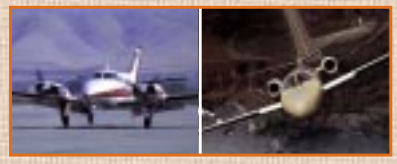




D

OPERATIONS

Arrivals and Departures



Total Annual Operations

Touch-and-Go Operations

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Exhibit 3B
FACTORS INFLUENCING
ANNUAL SERVICE VOLUME

small aircraft. A precision instrument approach is available to Runway 14 and a non-precision instrument approach is available to Runway 32. Airfield capacity is reduced during low visibility (instrument) conditions.

! **Runway Use**

Runway use is normally dictated by wind conditions. The direction of take-offs and landings is generally determined by the speed and direction of wind. It is generally safest for aircraft to take off and land into the wind, avoiding a crosswind (wind that is blowing perpendicular to the travel of the aircraft) or tailwind components during these operations. Prevailing winds favor use of Runways 32 and 27. Two VFR configurations and one IFR configuration are available in north or south flow.

! **Exit Taxiways**

Exit taxiways have a significant impact on airfield capacity since the number and location of exits directly determines the occupancy time of an aircraft on the runway. The airfield capacity analysis gives credit to exits located within a prescribed range from a runway's threshold. This range is based upon the mix index of the aircraft that use the runway. The exits must be at least 750 feet apart to count as separate exits. Under this criteria, each configuration has either two or three available exits (providing optimum capacity).

Meteorological Conditions

Weather conditions can have a significant affect on airfield capacity. Airport capacity is usually highest in clear weather, when flight visibility is at its best. Airfield capacity is diminished as weather conditions deteriorate and cloud ceilings and visibility are reduced. As weather conditions deteriorate, the spacing of aircraft must increase to provide allowable margins of safety. The increased distance between aircraft reduces the number of aircraft which can operate at the airport during any given period. This consequently reduces overall airfield capacity.

There are three categories of meteorological conditions, each defined by the reported cloud ceiling and flight visibility. Visual Flight Rule (VFR) conditions exist whenever the cloud ceiling is greater than 1,000 feet above ground level, and visibility is greater than three statute miles. VFR flight conditions permit pilots to approach, land, or take off by visual reference and to see and avoid other aircraft.

Instrument Flight Rule (IFR) conditions exist when the reported ceiling is less than 1,000 feet above ground level and/or visibility is less than three statute miles. Under IFR conditions pilots must rely on instruments for navigation and guidance to the runway. Other aircraft cannot be seen and safe separation between aircraft must be assured solely by following air traffic control rules and procedures. As mentioned, this leads to increased distances between aircraft which diminishes airfield capacity.

Poor Visibility Conditions (PVC) exist when the cloud ceiling and/or visibility is less than cloud ceiling and visibility minimums prescribed by the instrument approach procedures for the airport. Essentially, the airport is closed to arrivals during PVC conditions.

According to local weather data, VFR conditions exist 92.2 percent of the time, IFR conditions occur 5.4 percent of the time, and PVC conditions occur the remaining 2.4 percent of the time.

Aircraft Mix

Aircraft mix refers to the speed, size, and flight characteristics of aircraft operating at the airport. As the mix of aircraft operating at an airport increases to include larger aircraft, airfield capacity begins to diminish. This is due to larger separation distances that must be maintained between aircraft of different speeds and sizes.

Aircraft mix for the capacity analysis is defined in terms of four aircraft classes. Classes A and B consist of single and multi-engine aircraft weighing less than 12,500 pounds. Aircraft within these classifications are primarily associated with general aviation operations. Class C consists of multi-engine aircraft weighing between 12,500 and 300,000 pounds. This is broad classification that includes business jets, turboprops, military aircraft, and commercial airline aircraft. Class D includes all aircraft over 300,000 pounds and includes wide-bodied and jumbo jets. **Exhibit 3B** depicts representative aircraft in each aircraft class.

For the capacity analysis, the percentage of Class C/D aircraf operating at the airport is critical in determining the annual service volume as this class includes the larger and faster aircraft in the operational mix. The existing and projected operational fleet mix for the airport is summarized in **Table 3B**. Consistent with projections prepared in the previous chapter, the operational fleet mix at the airport is expected to increase slightly its percentage of Class C/D through the planning period as air cargo and passenger activities become more significant.

TABLE 3B
Aircraft Operational Mix

	A & B	C/D
Existing (1999)	71.9%	28.1%
Short Term	67.4%	32.6%
Intermediate Term	66.3%	33.7%
Long Term	63.1%	36.9%

Demand Characteristics

Operations, not only the total number of annual operations, but the manner in which they are conducted, have an important effect on airfield capacity. Peak operational periods, touch-and-go operations, and the percent of arrivals impact the number of annual operations that can be conducted at the airport.

! **Peak Period Operations**

For the airfield capacity analysis, average daily operations and average peak hour operations during the peak month is calculated. These operational levels were calculated previously in Chapter Two for existing and forecast levels of operations. Typical operational activity is important in the calculation of an airport's annual service level as "peak demand" levels occur sporadically. The peak periods used in the capacity analysis are representative of normal operational activity and can be exceeded at various times through the year.

! **Touch-and-Go Operations**

A touch-and-go operation involves an aircraft making a landing and an immediate take-off without coming to a full stop or exiting the runway. These operations are normally associated with training operations and are included in local operations data recorded by the air traffic control tower. For the capacity analysis, touch-and-go operations were assumed to account for 50 percent of operations during a typical peak hour.

Touch-and-go activity is counted as two operations since there is an arrival and a departure involved. A high percentage of touch-and-go traffic normally results in a higher operational capacity because one landing and one takeoff occurs within a shorter time than individual operations.

! **Percent Arrivals**

The percentage of arrivals as they relate to the total operations in the design hour is important in determining airfield capacity. Under most circum-stances, the lower the percentage of arrivals, the higher the hourly capacity. However, except in unique circum-stances, the aircraft arrival-departure split is typically 50-50. Traffic information indicated no major deviation from this pattern, and arrivals were estimated to account for 50 percent of design period operations.

CALCULATION OF ANNUAL SERVICE VOLUME

The preceding information was used in conjunction with the airfield capacity methodology developed by the FAA to determine airfield capacity for Rogue Valley International - Medford Airport.

Hourly Runway Capacity

The first step in determining annual service volume involves the computation of the hourly capacity of each runway in use configuration. The percentage use of each runway, the amount of touch-and-go training activity, and the number and locations of runway exits become important factors in determining the hourly capacity of each runway configuration.

As the mix of aircraft operating at an airport changes to include a greater utilization of Class C and D aircraft, the hourly capacity of the runway system is reduced. This is because larger aircraft

require longer utilization of the runway for takeoffs and landings, and because the greater approach speeds of the aircraft require increased separation. This contributes to a slight decline in the hourly capacity of the runway system over the planning period.

Annual Service Volume

Once the hourly capacity is known, the annual service volume can be determined. Annual service volume is calculated by the following equation:

Annual Service Volume = C x D x H
C = weighted hourly capacity D = ratio of annual demand to average daily demand during the peak month H = ratio of average daily demand to average peak hour demand during the peak month

Annual service volume has been calculated for two situations. First, ASV has been calculated assuming the existing runway configuration can be used by all of the aircraft using (and expected to use) the airport. The previous master plan included a recommendation to add a parallel runway for small aircraft. A second calculation was prepared to examine airfield capacity in this situation.

Following this formula, the current annual service volume for Rogue Valley International - Medford Airport has been estimated at 117,000 operations. The increasing percentage of larger Class C/D aircraft over the planning period is expected to contribute to a decline in the annual service volume, lowering annual service volume to a level of 112,000 operations by the end of the planning period.

TABLE 3C
Annual Service Volume Comparison

	Annual Operations	Weighted Hourly Capacity	Annual Service Volume	Percent Capacity	Total Annual Hours of Aircraft Delay
EXISTING CONFIGURATION					
Existing (1998)	70,217	75	117,000	60.0%	936
Short Term	78,695	73	114,000	69.0%	1,312
Intermediate Term	84,175	73	113,000	74.5%	1,684
Long Term	96,975	72	112,000	86.6%	2,748
WITH PARALLEL RUNWAY					
Existing (1998)	70,217	92	143,000	49.1%	585
Short Term	78,695	90	139,000	56.6%	918
Intermediate Term	84,175	89	138,000	61.0%	1,122
Long Term	96,975	88	137,000	70.8%	1,778

Following the same formula above, a calculation of annual service volume was prepared to compare airfield capacity with a parallel runway (as recommended in previous master plans). As shown in **Table 3C**, the annual service volume with a parallel runway increases to 143,000 under existing operational and demand situations. By the end of the planning period, the annual service volume with a parallel runway is projected to be 137,000 operations. It has been assumed that the parallel runway would be limited to small aircraft operations.

Delay

As the number of annual aircraft operations approaches the airfield's capacity, increasing amounts of delay to aircraft operations begin to occur. Delays occur to arriving and departing aircraft in all weather conditions. Arriving aircraft delays result in aircraft holding outside of the airport traffic area. Departing aircraft delays result in aircraft holding at the runway end until released by the airport traffic control tower.

Under existing conditions, total annual delay at the airport is minimal and is estimated at 936 hours. In the long-term planning horizon, annual delay is expected to reach 2,943 hours. With a parallel runway, annual delay would be expected to be reduced to 1,904 hours in the long range planning horizon. **Table 3C** summarizes annual delay for each runway configuration at each planning horizon.

Conclusion

Exhibit 3C compares annual service volume to existing and forecast operational levels for each runway configuration. The 1998 total of 70,217 operations represented 60.0% of the annual service volume. By the end of the planning period, total annual operations are expected to represent 92.7% of annual service volume, creating additional delays to aircraft.

FAA Order 5090.3B, *Field Formulation of the National Plan of Integrated Airport Systems* (*NPIAS*), indicates that improvements for airfield capacity purposes should be considered when operations reach 60 percent of the annual service volume. Addition of a parallel runway for small aircraft will increase capacity and reduce future aircraft delays.

Runway Orientation

The airport is presently served by intersecting runways. For the operational safety and efficiency of an airport, it is desirable for the principal runway of an airport's runway system to be oriented as close as possible to the direction of the prevailing wind. This reduces the impact of wind components perpendicular to the direction of travel of an aircraft that is landing or taking off (defined as a crosswind).

FAA design standards recommend additional runway configurations when the primary runway configuration provides less than 95 percent wind coverage at specific crosswind compon-

ents. The 95 percent wind coverage is computed on the basis of crosswinds not exceeding 10.5 knots for small aircraft weighing less than 12,500 pounds and from 13 to 20 knots for aircraft weighing over 12,500 pounds.

According to wind data summarized for the previous 10-year period at Medford, the existing primary runway (14-32) configuration provides more than 95 percent wind coverage in all crosswind conditions. **Table 3D** summarizes the wind coverages.

TABLE 3D
Wind Coverage Summary - Runway 14-32 (All-Weather)

	10.5 knots	13 knots	16 knots	20 knots
Runway 14-32	98.86%	99.57%	99.93%	99.99%

Source: National Climatic Center, Recorded at Medford, OR 1990-1999.

Runway Length

The determination of runway length requirements for an airport are based on five primary factors: airport elevation; mean maximum temperature of the hottest month; runway gradient (difference in elevation of each runway end); critical aircraft type expected to use the airport, and stage length of the longest nonstop trip destinations.

Aircraft performance declines as each of these factors increase. Summertime temperatures and stage lengths of large transport aircraft are the primary factors in determining runway length requirements.

For calculating runway length requirements, airport elevation is 1,331 feet above mean sea level (MSL) and the mean maximum temperature of the hottest month is 92 degrees Fahrenheit. Runway 14-32 has an effective runway gradient of .55 percent, and Runway 9-27 has an effective gradient of .25 percent.

To determine runway length requirements for the airport, take-off runway lengths of typical transport aircraft used for air cargo and passenger services have been calculated. Since passenger aircraft are operating on shorter stage lengths (less than 500 miles), and are expected to continue similar stage lengths in the future, the critical runway length evaluations will be based on forecast cargo aircraft. In calculating the runway requirements for these aircraft, near maximum loading (payload and fuel) has been assumed. Stage lengths for most domestic (and some international) air cargo aircraft are not expected to exceed 2,000 nautical miles, while long-range international traffic is not expected to exceed 6,000 nautical miles. As shown in **Table 3E**, runway length requirements vary by aircraft type and range from 6,000 feet to 11,000 feet. The extended length of Runway 14-32 (8,800 feet) will satisfy all domestic flights, while longer international segments will be subject to payload limitations.

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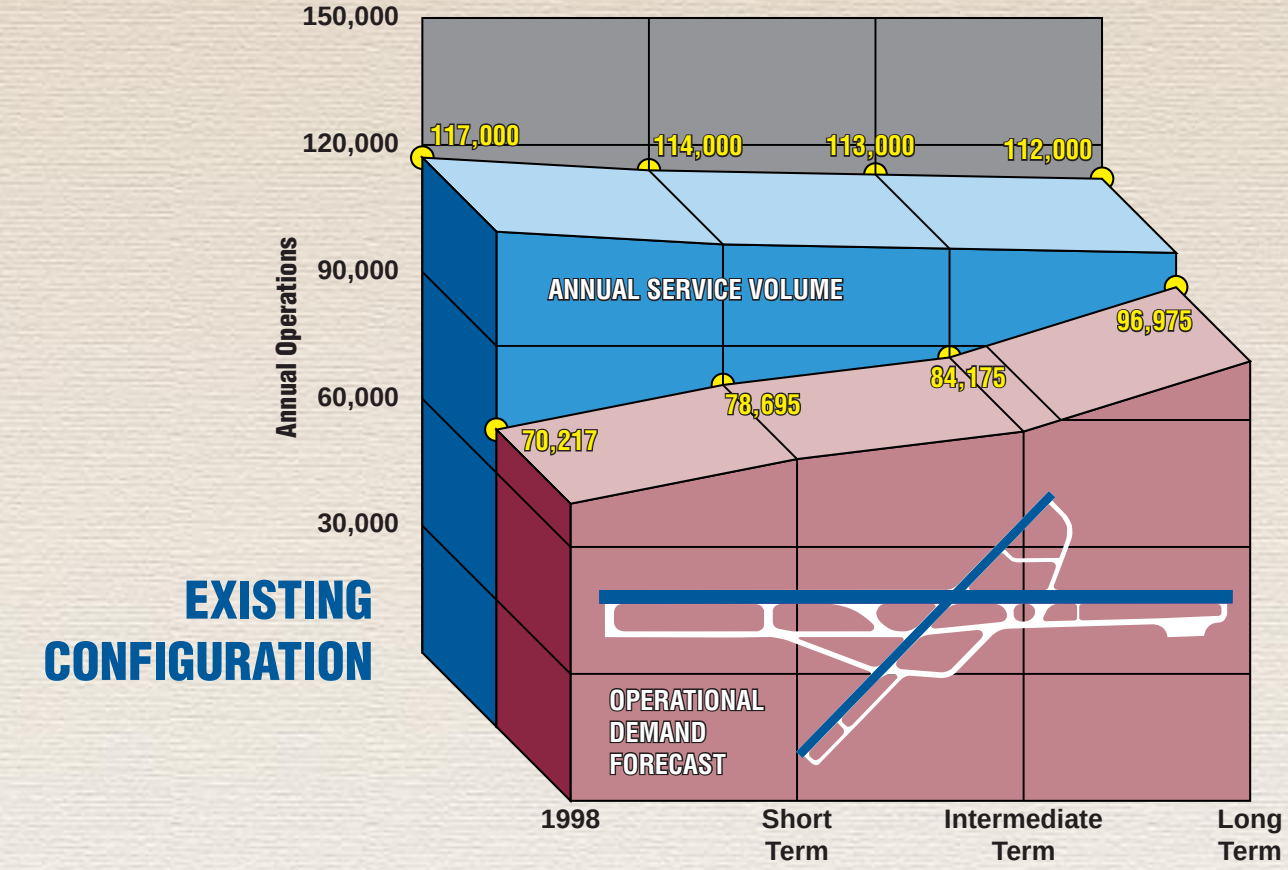
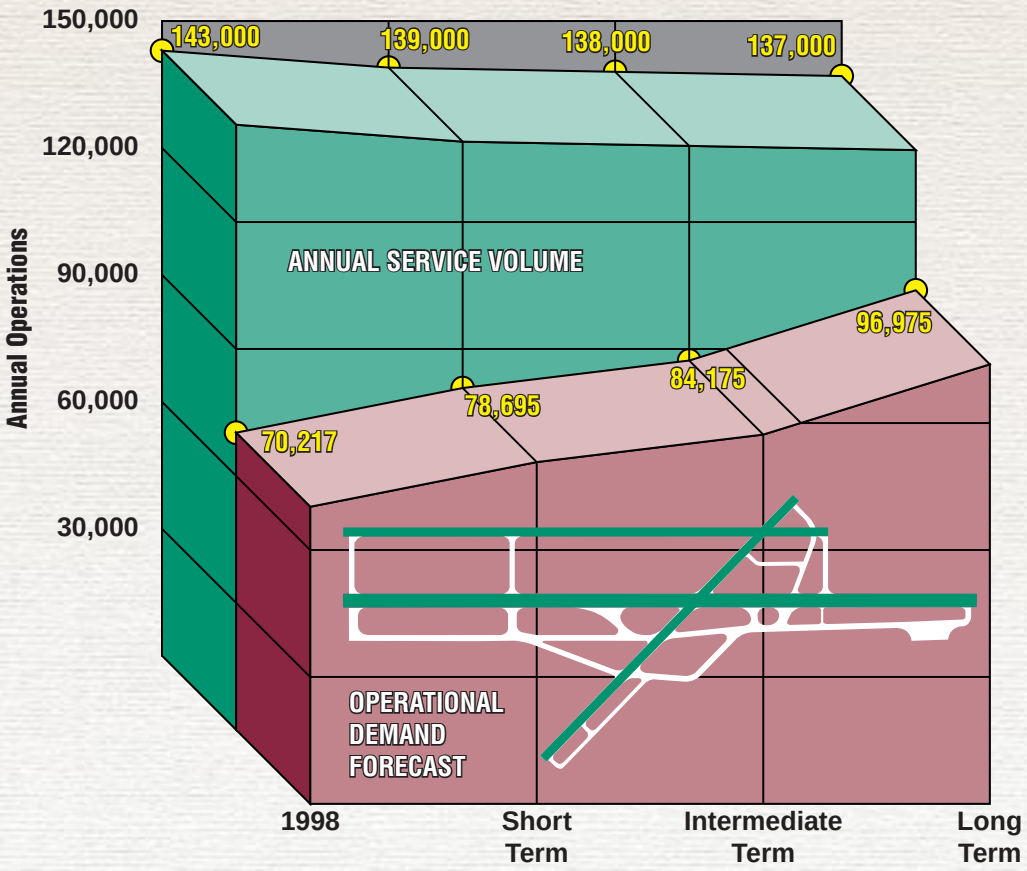


EXISTING CONFIGURATION



WITH PARALLEL RUNWAY*

* Limited to small aircraft.

JACKSON COUNTY
Airport Authority

Exhibit 3C
DEMAND VS. CAPACITY SCENARIOS

TABLE 3E
Runway Length Requirements - Cargo Aircraft

Aircraft/Stage Length (nautical miles)	Runway Length (feet)
McDonnell-Douglas DC-10-10/3,000 nm	11,000
McDonnell-Douglas MD-11/6,000 nm	10,500
Boeing 747-400F/6,000 nm	9,700
Boeing 767-400 ER/6,000 nm	11,000
Boeing 727-200/2,000 nm	8,500
Boeing 757-200 PF/2,000 nm	6,000
Airbus A300-600/2,000 nm	7,000
Airbus A310 C/2,000 nm	6,000

Source: FAA Advisory Circular 5325-4A, Runway Length Requirements for Airport Design
Aircraft Characteristics for Airport Planning (Boeing, McDonnell-Douglas, Airbus)

The FAA runway length design model was applied to determine the appropriate length for existing Runway 9-27 or a parallel runway limited to use by aircraft less than 12,500 pounds. Based upon local altitude and temperature, the recommended length is approximately 4,500 feet. This corresponds to aircraft within the ARC of B-II for "small airplanes with 10 or more passenger seats."

Runway Width

Presently, Runway 14-32 is 150 feet wide. This width is adequate for aircraft through ADG V. Runway 9-27 is 100 feet wide, which meets ADG III standards (and exceeds the ADG II standard for which it should be planned). A parallel runway to serve ADG II aircraft should be 75 feet wide.

Runway Pavement Strength

The most important feature of airfield pavement is its ability to withstand repeated use by aircraft of significant weight. At the airport, this includes a wide range of civilian aircraft. The current strength ratings for Runways 14-32 and 9-27 have been summarized in **Table 3F**. It is expected that the critical aircraft in the medium wide-body classification will include the A310, A300, and B767. However, it is possible that future air cargo may be transported on DC-10, MD-11, or 747 aircraft. These represent the largest aircraft expected to operate at the airport through the planning period. Adequacy of pavement sections would need to consider the frequency of landings. Therefore, the primary runway is expected to adequately serve the loading requirements of critical aircraft in most situations.

TAXIWAYS

Taxiways are constructed primarily to facilitate aircraft movements to and from the runway system. Some taxiways are necessary simply to provide access between the aprons and runways, whereas other taxiways become necessary as activity increases

at an airport to provide safe and efficient use of the airfield. Presently, a combination of connecting taxiways and parallel taxiways provide access between the aprons and runways.

TABLE 3F
Pavement Strength Ratings (pounds)

	Runway 14-32	Runway 9-27
Single Wheel Loading (SW)	75,000	50,000
Dual Wheel Loading (DW)	200,000	70,000
Dual-Tandem Wheel Loading (DTW)	400,000	108,000

Source: Airport Layout Plan, 1993, ATPG.

The current Airport Layout Plan includes several taxiway improvements to improve airfield access and provide more direct and efficient access to the runways and landside areas. The primary taxiway improvement involves a straightening of the parallel taxiway (A) from Taxiway A3 to the threshold of Runway 32. The current Airport Layout Plan also depicts the development of connecting taxiways to a parallel runway to serve general aviation traffic, and the widening of a portion of Taxiway A from 60 to 75 feet.

Taxiway width is determined by the ADG of the most demanding aircraft to use the taxiway. As mentioned previously, the most demanding aircraft to use the airfield fall within ADG IV. According to FAA design standards, the minimum taxiway width for ADG IV is 75 feet. Taxiways serving ADG II require a minimum width of 35 feet.

NAVIGATIONAL AIDS AND INSTRUMENT APPROACH PROCEDURES

A number of electronic navigational aids are in place to assist pilots in locating and landing. The Rogue Valley VORTAC, Runway 14 Instrument Landing System, a Localizer Back Course to Runway 32, and GPS navigational aids assist pilots during poor weather conditions when following instrument approach procedures established by the FAA.

The advent of Global Positioning System (GPS) technology will ultimately provide the airport with the capability of establishing instrument approaches at minimal cost since there is not a requirement for the installation and maintenance of costly ground-based transmission equipment at the airport. As mentioned previously in Chapter One, the FAA is proceeding with a program to transition from existing ground-based navigational aids to a satellite-based navigation system utilizing GPS technology. Currently, GPS is certified for enroute guidance and for use with instrument approach procedures. The initial GPS approaches being developed by the FAA provide only course guidance information. By the year 2003, it is expected that GPS approaches will also be certified for use in providing descent information for an instrument approach. This capability is

currently only available using an Instrument Landing System approach to Runway 14.

GPS approaches fit into three categories, each based upon the desired visibility minimum of the approach. The three categories of GPS approaches are: one-half mile, three-quarter mile, and one mile. To be eligible for a GPS approach, the airport landing surface must meet specific standards as outlined in FAA AC 150/5300-13, *Airport Design*, Appendix 16. The specific airport landing surface requirements which must be met in order to establish a GPS approach are summarized in **Table 3G**.

Presently, only Runway 14 fully meets the requirements for a one-half mile visibility GPS approach since the other runway approaches are not equipped with a medium intensity approach lighting system with runway alignment lighting (MALSR) approach lighting system. In addition, Runway 9-27 does not meet minimum length requirements for an approach below one-mile visibility.

TABLE 3G
GPS Instrument Approach Requirements

Requirement	One-Half Mile Visibility	¾ Mile Visibility Greater Than 300-Foot Cloud Ceiling	One Mile Visibility Greater Than 400-Foot Cloud Ceiling
Minimum Runway Length	4,200 Feet	3,500 Feet	2,400 Feet
Runway Markings	Precision	Nonprecision	Visual
Runway Edge Lighting	Medium Intensity	Medium Intensity	Low Intensity
Approach Lighting	MALSR	ODALS Recommended	Not Required

Source: FAA AC 150/5300-13, *Airport Design*, Change 6, Appendix 16.

MALSR - Medium Intensity Approach Lighting System with Runway Alignment Lighting
ODALS - Omni-directional Approach Lighting System

According to regional weather observations, visual weather conditions (visibility greater than three miles and cloud ceiling greater than 1,000 feet above the ground) occur 92 percent of the time. Therefore, it may not be necessary to provide instrument approach capability to one-half mile minimums at each runway end.

The previous master plan recommended the establishment of a one-half mile visibility approach to Runway 32. Based upon rising terrain in the area, planning for a 50:1/40:1 approach from the south should be reconsidered, since terrain may preclude the ability to obtain anything lower than a 34:1 approach.

LIGHTING AND MARKING

Currently, there are a number of lighting and pavement marking aids serving pilots and aircraft using the airport. These lighting and marking aids assist pilots in locating the airport during night or poor weather conditions, as well as assist in the ground movement of aircraft.

Runway markings are designed according to the type of instrument approach available on the runway. FAA AC 150/5340-1F, *Marking of Paved Areas on Airports*, provides the guidance necessary to design an airport's markings. Runway 14-32 has precision runway markings, while Runway 9-27 has basic markings.

Taxiway and apron areas also require marking to assure that aircraft remain on the pavement. Yellow centerline stripes are currently painted on all taxiway and apron surfaces at the airport to provide this guidance to pilots. Aircraft parking positions are also marked on each apron area. Besides routine maintenance, these markings will be sufficient through the planning period.

Airport lighting systems provide critical guidance to pilots during nighttime and low visibility operations. Runway 14-32 is equipped with high intensity runway lighting (HIRL), while Runway 9-27 is equipped with medium intensity runway lighting (MIRL). These systems are sufficient and should be maintained through the planning period. In addition, centerline and touchdown zone lighting was recently added on Runway 14-32. During periods of tower closure, airfield lighting may be activated with radio control.

Effective ground movement of aircraft at night is enhanced by the availability of taxiway lighting. Presently, medium intensity taxiway edge lighting is available on all taxiways.

The airport is equipped with a rotating beacon to assist pilots in locating the airport at night.

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, visual glideslope indicators (VGSI's) are commonly provided at airports. Presently, VGSIs are available to Runways 14 and 32 in the form of a four-light precision approach path indicator (PAPI) on Runway 14 and a four-box visual approach slope indicator (VASI) on Runway 32. Facility planning should provide for the eventual replacement of the system on Runway 32 with a PAPI.

Approach lighting systems provide the basic means to transition from instrument flight to visual flight for landing. A medium intensity approach lighting system with runway alignment lighting (MALSR) is required for one-half mile visibility minimum instrument landing system and global positioning system instrument approach procedures. To lower the visibility minimums (below 200 feet), the MALSR system on Runway 14 will need to be upgraded to an ALSF-2 system, which adds additional lights and higher intensity lighting.

CONCLUSIONS

A summary of the airfield facility requirements is presented on **Exhibit 3D**. Planning should continue to reflect a parallel runway for light aircraft. However, since the primary runway alignment provides 95 percent coverage, Runway 9-27 may be closed upon construction of a parallel runway. The existing runway lengths, widths, and strengths are sufficient to serve the expected mix of aircraft through the planning period, unless long-range air cargo flights justify a longer length on Runway 14-32. GPS precision approach capability will become available within the next five years. The VASI on Runway 32 should eventually be replaced with a PAPI. The MALSR approach lighting system on Runway 14 will need to be upgraded to an ALSF-2 system to realize lower minimums on the Runway 14 approach.

LANDSIDE REQUIREMENTS

Landside facilities are those necessary for handling of aircraft, passengers, and freight while on the ground. These facilities provide the essential interface between the air and ground transportation modes. The capacities of the various components of each area were examined in relation to projected demand to identify future landside facility needs.

TERMINAL AREA REQUIREMENTS

Components of the terminal area complex include the terminal apron, vehicle parking area, and the various functional elements within the terminal building. This section identifies the terminal area facilities required to meet the airport's needs through the planning period.

The requirements for the various terminal complex functional areas were determined with the guidance of FAA Advisory Circular 150/5360-13, *Planning and Design Guidelines for Airport Terminal Facilities*. The consultant's database for space requirements was also considered.

Facility requirements were developed for the planning period based upon the forecast enplanement levels. It should be noted that actual need for construction of facilities will be based upon enplanement levels rather than a forecast year.

Exhibit 3E summarizes passenger terminal building functional area requirements for forecast enplanement levels. The various functional areas of the terminal building are summarized as follows:

- **Ticketing** - includes estimates of the space necessary for the queuing of passengers at ticket counters, the linear footage of ticket counters, and the space necessary to accommodate baggage make-up and airline ticket offices.

- **Departure Facilities** - includes estimates of the space necessary for departure holdrooms and the number of aircraft gate positions. Holdroom space and gate positions in excess of the requirements presented on the

exhibit are frequently necessary to accommodate individual airline demands or segregation of upper level/lower level boarding areas.

- **Baggage Claim** - includes estimates of the linear footage of baggage claim needed and space for passengers to claim baggage.

- **Rental Cars** - includes estimates of space necessary for the queuing of passengers at rental car counters, the space necessary for rental car offices, and the linear footage for rental car counters.

- **Concessions** - includes estimates of the space necessary to provide adequate concession services such as restaurant and retail facilities.

- **Security Screening** - include estimates of the amount of space required to accommodate passenger screening devices, the queuing of passengers, and security offices.

- **Public Waiting Lobby** - includes estimates of the amount of space to accommodate arriving and departing passengers.

- **Terminal area automobile parking** - includes the number of parking spaces required for long-term and short-term public parking, employee parking, and rental car parking.

- **Terminal curb frontage** - includes an estimate of the linear footage of curb required to accommodate the queuing of enplaning and deplaning passenger vehicles.

The terminal building area calculations include factors for circulation and mechanical systems. While these estimates provide reasonable planning guidelines, specific airline requirements should be incorporated in the actual design of terminal buildings.

AIR CARGO REQUIREMENTS

The two primary cargo-related facilities requiring analysis include the cargo apron and building space for sorting and transfer. Presently, there are several buildings dedicated to air cargo on the airport. The foreign trade zone on the east side of the airfield is expected to handle a significant portion of future demand, although the warehouse and office buildings in the FTZ have not been included in the existing building space calculation. Areas south of the terminal (or similar facilities elsewhere on the airport) are expected to meet most of the remaining demand.

An industry planning standard of 200 pounds of enplaned cargo per square foot was used to determine building space requirements and a planning standard of 3.5 square feet of apron per square foot of building was used to estimate future apron requirements. Vehicles are typically loaded at cargo buildings using truck docks or drive-in garages. The demand for docks and garages will vary with each company. However, each cargo building should be planned with the capability to process

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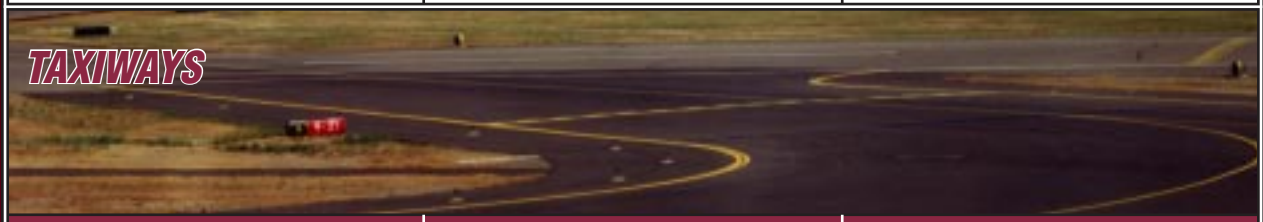
EXISTING	SHORT TERM NEED (5 years +/-)	LONG TERM NEED (15 years +/-)
Runway 14-32 8,800' x 150' 75,000 SW • 200,000 DW 400,000 DT Grooved **Runway 9-27** 3,155' x 100' 50,000 SW • 70,000 DW 108,000 DT	**Runway 14-32** Maintain length, width, and strength **Runway 9-27** Maintain strength rating and surface	**Runway 14-32** Consider extension for long-range air-cargo flights **Runway 9-27** Close runway (when parallel runway is constructed) Add parallel runway (4,500' x 75')



EXISTING	SHORT TERM NEED (5 years)	LONG TERM NEED (15 years +/-)
Parallel taxiway systems	Taxiway A Realignment	Connecting taxiways to parallel runway

EXISTING	SHORT TERM NEED (5 years +/-)	LONG TERM NEED (15 years +/-)
Rotating Beacon PAPI-4 (14) VASI-4 (32) HIRL (14-32) MIRL (9-27) CAT 1 ILS - 14 LOC BC -32 VOR/DME or GPS - 14 Touchdown/centerline lights	Transition VASI to PAPI system as per FAA recommendations Add ALSF-2 Transition to GPS approaches as equipment becomes operational (may extend into long-term period)	Maintain approaches Add MIRL, PAPI-4, and GPS approaches to parallel runway

ILS - Instrument Landing System
GPS - Global Positioning System
PAPI - Precision Approach Path Indicator
MLS - Microwave Landing System
VASI - Visual Approach Slope Indicator
HIRL - High Intensity Runway Lights
MIRL - Medium Intensity Runway Lights
MITL - Medium Intensity Taxiway Lights
LOC BC - Localizer Back Course
VOR - Very High Frequency Omnidirectional Range Facility
DME - Distance Measuring Equipment
MALSR - Medium Intensity Approach Lighting System with Runway Alignment Indicator Lighting
ALSF-2 - Approach Lighting System; with Sequenced Flashing Lights
SW - Single Wheel
DW - Dual Wheel
DT - Dual Tandem
PFC - Porous Friction Course

JACKSON COUNTY
Airport Authority

Exhibit 3D
AIRFIELD REQUIREMENTS

	ENPLANEMENTS				
	EXISTING	220,000	250,000	300,000	400,000
TICKETING					
Counter Length (l.f.)	90	85	100	115	150
Counter Area (s.f.)	700	850	1,000	1,150	1,500
Ticket Lobby (s.f.)	2,250	2,120	2,500	2,900	3,700
Airline Operations/Bag Make-up (s.f.)	4,375	4,900	5,250	6,600	7,300
DEPARTURE FACILITIES					
Aircraft Gates	4	4	5	5	6
Holdroom Area (s.f.)	2,500	4,180	4,950	5,720	7,260
BAGGAGE CLAIM					
Claim Display (l.f.)	80	190	225	260	330
Baggage Claim Lobby (s.f.)	1,800	5,470	6,400	7,300	9,150
TERMINAL SERVICES					
Rental Car					
Counter Length (l.f.)	40	78	85	95	110
Office Area (s.f.)	400	1,550	1,700	1,900	2,200
Lobby (s.f.)	400	470	510	570	660
Food/Beverage (s.f.)	6,700	7,600	8,800	10,000	12,500
Retail (s.f.)	750	950	1,100	1,300	1,600
Restrooms (s.f.)	1,650	1,370	1,600	1,800	2,300
PUBLIC LOBBY					
Greeting/Farewell Area/Security Queuing (s.f.)	4,500	7,030	8,200	9,300	11,600
SECURITY SCREENING					
Security Stations	1	1	1	2	2
Security Equipment Area (s.f.)	150	170	170	340	340
Security Offices (s.f.)	80	100	100	200	200
SUBTOTAL PROGRAMMED AREA*	**31,000**	**40,700**	**46,700**	**54,000**	**66,700**
General Circulation, Mechanical/ Electrical, Maintenance & Storage (s.f.)	11,000	14,300	16,300	19,000	23,300
TOTAL TERMINAL AREA	**42,000**	**55,000**	**63,000**	**73,000**	**90,000**
AUTO PARKING					
Public					
Short Term	100	170	200	220	270
Long Term	333**	680	780	940	1,250
Rental Car	164	150	175	210	280
Employee	210	200	225	270	360
TERMINAL CURB					
Enplane Curb (l.f.)	150	170	200	230	300
Deplane Curb (l.f.)	150	200	240	270	350

* Also includes administrative area and conference room.

** Overflow lot provides additional 225 spaces.

Source: Coffman Associates analysis.

JACKSON COUNTY Airport Authority

Exhibit 3E
PASSENGER TERMINAL
BUILDING REQUIREMENTS

trucks. **Exhibit 3F** summarizes air cargo apron and building requirements through the planning period.

GENERAL AVIATION REQUIREMENTS

This section will evaluate the space requirements for general aviation hangars and apron. Currently aircraft storage and maintenance is being met through the use of both T-hangars and conventional hangars, which can accommodate multiple aircraft simultaneously. Presently, general aviation facilities are located along Taxiway B west of the passenger terminal, and at the north end of the airfield, adjacent to Taxiway A.

Utilization of hangar space varies as a function of local climate, security, and owner preferences. The trend in general aviation aircraft, whether single or multi-engine, is in more sophisticated (and consequently more expensive) aircraft. Therefore, many hangar owners prefer hangar space to outside tiedowns. For this analysis, it has been assumed that 70 percent of single-engine, 80 percent of multi-engine and helicopters, and 100 percent of jet aircraft will need to be hangared. Sixty-five percent of the single-engine hangared demand is expected to be met with T-Hangars (this results in a shift in a short-term need to conventional hangars).

Future hangar requirements for the airport are summarized on **Exhibit 3F**. A planning standard of 1,200 square feet per based aircraft stored in T-hangars has been used to determine future T-hangar requirements. A planning standard of 2,500 square feet for remaining aircraft stored in conventional hangars has been used to determine future conventional hangar requirements. Conventional hangar area was increased by 15 percent to account for future aircraft maintenance needs.

A parking apron should be provided for at least the number of locally-based aircraft that are not stored in hangars, as well as transient aircraft. Transient positions were calculated at 25 percent of the forecast busy day operations (as forecast in the previous chapter). Total apron area requirements were determined by applying a planning criterion of 700 square yards per transient aircraft parking position and 500 square yards for each locally-based aircraft parking position. The results of this analysis are presented on **Exhibit 3F**.

General aviation terminal building space is required for waiting passengers, pilot's lounge and flight planning, concessions management, storage, and various other needs. This space is not provided in a single, separate terminal building, but is offered by fixed base operators (FBOs and private companies) which operate from different locations on the airfield.

The methodology used in estimating general aviation terminal facility area was based on the number of airport users expected to utilize general aviation facilities during a typical design hour (estimated at 2.5 per flight, and 90 square feet per passenger). **Exhibit 3F** outlines these require-ments.

Public vehicle parking is located adjacent to each existing FBO building, and private conventional hangars. It will be required adjacent to new hangar development. Vehicle parking requirements for future facilities have been determined utilizing planning standards of 1.8 spaces per design hour passenger, two parking spaces per 1,500 square feet of new hangar area, and 400 square feet for each parking position. **Exhibit 3F** outlines vehicle parking requirements for the general aviation facilities.

SUPPORT REQUIREMENTS

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

AIRCRAFT RESCUE AND FIREFIGHTING

Requirements for Airport 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 serving air carriers having a seating capacity of more than 30 seats. Paragraph 139.315 of Subpart D of FAR Part 139 regulations establishes an ARFF index determination. This index rating is based on the number of departures conducted by passenger aircraft having at least 30 seats within a specific category (based on length of aircraft).

The airport currently meets the requirements for ARFF Index C, although current scheduled traffic requires that they only meet Index B. Index B covers aircraf with lengths up to 126 feet. Facilities should be sized to properly house the equipment that is required.

FUEL STORAGE

The existing capacities for Jet-A and AvGas are approximately 76,000 and 45,000 gallons, respectively. When fuel is delivered to the airport by truck, it cannot be used the day it is delivered – to allow for contaminants to separate from the fuel. Therefore, a multiple tank system is generally used. Each of the fixed base operators have multiple tanks at their disposal, for both Jet-A and AvGas. However, area should be reserved to allow for expansion of these fuel farms should their demands change through the planning period, while planning standards generally recommend a minimum two-week supply, the availability of a nearby wholesale supplier may generally allow for more limited reserves.

AIRPORT TRAFFIC CONTROL TOWER

A final site selection report for a new airport traffic control tower was published in June 1999. This report outlines the siting analysis undertaken for the new tower and the final recommendation for location of the new tower. The preferred site is on the west side of the airport, between Jet Center

AIR CARGO

	AVAILABLE	SHORT TERM NEED	INTERMEDIATE NEED	LONG TERM NEED
Building Space (s.f.)	20,000+	25,000	33,000	56,000
Apron Area (s.y.)	5,000+	9,700	12,700	21,900

GENERAL AVIATION

	AVAILABLE	SHORT TERM NEED	INTERMEDIATE NEED	LONG TERM NEED
Aircraft Storage Hangars				
T-hangar Positions	74	58	59	60
Conventional Hangar Positions	45*	56	65	77
T-hangar Area (s.f.)	116,000	70,000	70,000	72,100
Conventional Hangar Area (s.f.)**	160,000	160,000	187,000	221,000
Total Hangar Area (s.f.)	276,000	230,000	257,000	293,000
* *Hangars may contain multiple aircraft*				
** *Reflects maintenance areas*				
Apron Area				
Transient Apron Positions	37	75	81	93
Locally-Based Aircraft Positions	115	43	44	47
Total Positions	152	118	125	140
Total Transient/Based Apron Area (s.y.)	64,400	74,000	79,000	88,000
General Aviation Terminal Facilities				
Building Space (s.f.)	21,000*	8,100	9,000	10,000
* *Includes private conventional hangars*				
General Aviation Vehicle Parking				
Parking Spaces	425	440	490	560
Parking Area (s.f.)	130,000	176,000	196,000	222,000

JACKSON COUNTY Airport Authority

Exhibit 3F
AIR CARGO AND GENERAL AVIATION REQUIREMENTS

and the rental car lot. It assumes, based upon previous planning, that the passenger terminal will need to expand in a westerly direction.

SUMMARY

The intent of this chapter has been to outline the facilities required to meet potential aviation demands projected for the airport through the planning horizon. The next step is to develop a direction for development to best meet these projected needs. The remainder of the master plan will be devoted to outlining this direction, its schedule, and costs.

AIRPORT DEVELOPMENT ALTERNATIVES

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

While any evaluation of alternatives can also include a "no action" alternative, this would effectively reduce the quality of services being provided to the general public, and potentially affect the Medford area's ability to accrue additional economic growth. However, the final decision with regard to pursuing a development plan which

meets the needs of commercial airline, air cargo, and general aviation needs rest with the Jackson County Airport Authority. Economic and/or environmental costs may not always be offset by the potential benefit of each and every project in the plan.

Although this study will not consider the relocation of services to another airport, it is always a potential alternative. It would be difficult to duplicate the services provided by Rogue Valley International Airport, whether at an existing facility or a new site. The economic and environmental costs of new site development are generally far greater than the cost of

developing an existing site. It is frequently possible to relocate or encourage the relocation of some services to another facility, should it become necessary. For example, training activity by general aviation or military aircraft can be encouraged to go elsewhere. It is also possible to encourage the basing of small aircraft at Ashland or other outlying airports. However, most services provided at Rogue Valley International (the control tower, a long runway, precision approaches, and other miscellaneous services) are not readily available at Ashland or other nearby airports. Therefore, the master planning process must attempt to deal with the facility needs which have been identified in the previous chapter, at the levels forecast throughout the twenty-year planning period.

There are several functional areas at Rogue Valley International Airport which must be considered: the airfield, passenger terminal complex, air cargo complex (including the foreign trade zone), general aviation facilities, and miscellaneous airport support facilities. Each of these functional areas interrelate to each other and affect the development potential of the others. Therefore, all areas must be examined both individually and collectively to ensure a final plan that is functional, efficient, cost effective, and compatible with the environment. Through this process, a master planning concept will evolve.

BACKGROUND

Prior to presenting airport development alternatives, it is helpful to review some of the previous airport planning efforts and the development that has occurred during the intervening years. Recounting recent (or ongoing) improvements will assist with the identification of current issues affecting future development options.

When the last master plan was completed in October 1993, a capital improvement program was established which included (within the first ten years of the plan) the purchase of land for terminal and general aviation expansion, expansion of the terminal and parking areas, extension of Runway 14-32 (and the addition of touchdown zone and centerline lights), relocation of Taxiway A, and relocation of the control tower. In addition, a number of projects were recommended to improve the efficiency of access roads on the airport, and to provide facilities for air cargo, general aviation, and airport support functions.

Several of these projects have either been completed or are underway, although an expansion of the terminal building has not been undertaken. A study undertaken for relocation of the control tower has recently been completed, and the airport has recently completed the extension of Runway 14-32. Land purchases will allow for the expansion of general aviation facilities on the west side of the airport. A number of projects included within the first ten years of the plan have not been undertaken. While some of these projects may be confirmed within this planning update, some may be dropped from further consideration. New demands on the airport may require that new projects be included which demonstrate a higher priority.

The expansion of the terminal building and redevelopment of the circulation roadways was one of the more capital intensive projects recommended in the last master plan. However, the passenger enplanement levels remained static through the early 90s, which tended to shift the priority for the project. With positive growth in passengers the past several years, the Jackson County Airport Authority has indicated that they feel that the current facility is exceeding its capacity (this was confirmed within the analysis undertaken in the last chapter) and that plans once again need to be examined for possible expansion of the terminal building and auto parking.

Air cargo facilities on the west side of the airfield have been modestly expanded to meet the needs of small package freight carriers. With limited area available for freight facilities on the west side of the airport, a taxiway, ramp area, and warehouse facilities have been constructed on the east side of the airfield, and additional facilities have been planned in the foreign trade zone to serve existing and future air cargo demands.

Redevelopment of general aviation facilities is currently being planned south of Runway 9-27 (adjacent to the terminal), and new storage hangars have been constructed north of Runway 9-27. With recent land purchases in the vicinity of Schultz Road, the airport will be able to expand hangar storage areas adjacent to existing hangars on the west side.

INITIAL DEVELOPMENT CONSIDERATIONS

Upon completion of the facility needs evaluation and a subsequent meeting with the Planning Advisory Committee for the master plan study, a number of airport development considerations were outlined. These considerations, which have been grouped into airside and landside categories, with some additional considerations for on-airport land use, have been summarized in **Exhibit 4A**. While many of these development considerations are demand driven (as passenger volumes, based aircraft, or operations levels increase at the airport), several are somewhat more general in nature, but remain as important considerations in the master planning process.

AIRFIELD DEVELOPMENT ALTERNATIVES

Airfield facilities are, by their very nature, a focal point of the airport complex. Because of their role, and the fact that they physically dominate a great deal of the airport's property, airfield facility needs are often the most critical factor in the determination of viable airport development alternatives. In particular, the runway system requires the greatest commitment of land area and often imparts the greatest influence on the identification and development of other airport facilities. Furthermore, due to the nature of aircraft operations, there are

a number of FAA design criteria that must be considered when looking at airfield improvements. These criteria, depending upon the areas around the airport, can often have a significant impact on the viability of various alternatives which are designed to meet airfield needs.

The facility needs evaluation completed in the last chapter indicated that the extended length of Runway 14-32 (8,800 feet) will be adequate to accommodate most domestic flights, while longer international destinations will be subject to payload limitations. The Jackson County Airport Authority is pursuing an independent evaluation of the implications associated with trying to provide longer stage length capabilities from the airport. Any recommendations from the independent evaluation will subsequently be folded into the airport's master plan. Potential conflicts associated with providing additional runway length on the airport property include: the need to relocate Vilas Road, terrain penetrations in the approach to Runway 14, and existing development constraints. The independent evaluation will more clearly define these constraints and the impact they may have on master planning for the airport.

Wind coverage at the airport does not justify a crosswind runway. However, Runway 9-27 serves an important function at the present time as a secondary runway on the airfield. Since planning for future airfield capacity calls for a parallel runway (in the 14-32 orientation), it has been recommended that Runway 9-27 be closed when the parallel runway is eventually constructed (the airport is not expected to reach airfield capacity until the end of the 20-year planning period, or beyond).

Taxiway improvements should include a straightening of the parallel taxiway (A) to maintain 400 feet of separation between the runway and the taxiway, and the construction of additional connecting taxiways when the parallel runway is constructed.

Several comments were received at the Planning Advisory Committee meeting relating to other upgrades on the airfield. The airport added equipment under the recent runway extension project to allow for upgrading the approach to Runway 14 to Category II standards.

AIRFIELD SAFETY CONSIDERATIONS

As a commercial service airport, Rogue Valley International Airport must comply with Federal Aviation Regulation Part 139, which provides certification requirements and operating standards for commercial service airports. A review of airfield design standards as they relate to the runways and safety areas of the two runways on the airfield indicates that the safety areas and object free areas at each end of Runway 14-32 meet current standards. However, since current marking on Runway 9-27 reflects stopways at each runway end, the safety areas extend beyond the stopway end. Since neither end of Runway 9-27 has adequate safety area beyond the

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AIRFIELD CONSIDERATIONS

- Extension of Runway 14-32 to 8,800 feet (project underway).
- Consider longer runway for trans-Pacific air cargo flights.
- Realign Taxiway A at south end to provide 400-foot separation from runway.
- Upgrade instrument approach to Runway 14 (underway with runway extension project).
- Reserve area for parallel runway to increase capacity.
- Transition to GPS approaches/update visual approach guidance.

TERMINAL/ACCESS CONSIDERATIONS

- Short-term need to expand terminal (bag claim, holdroom and rental car).
- Short-term need to expand public parking area.
- Evaluate ability to meet long-term needs in existing area.
- Evaluate entrance/exit onto Biddle Road.

GENERAL AVIATION CONSIDERATIONS

- Consider current hangar expansion proposals provided by Airport Authority.
- Evaluate ability to maximize hangar development areas (existing/new).
- Evaluate development potential if Runway 9-27 is closed.

AIR CARGO CONSIDERATIONS

- Consider current layout for air cargo facilities prepared for Airport Commerce Park.
- Maintain segregation of large aircraft cargo facilities from other commercial or general aviation activities.

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Exhibit 4A
ALTERNATIVE
DEVELOPMENT CONSIDERATIONS

paved stopway, it affects the declared distances calculations for the runway and future runway designation.

"Declared distances" define several operating conditions on runways: takeoff run available (TORA), which is the runway length declared available and suitable for the ground run of an airplane on takeoff; takeoff distance available (TODA), which is the TORA plus the length of any remaining clearway at the far end of the TORA; accelerate-stop distance available (ASDA), which is the runway plus stopway length available for the acceleration and deceleration of an aircraft aborting a takeoff; and landing distance available (LDA), which is the runway length declared available and suitable for landing.

If the stopways are not considered within the declared distances calculations, the ASDA will be shortened, and the safety areas will meet current standards. Additional coordination will be undertaken with the FAA with regard to correct marking and lighting for Runway 9-27, to ensure proper safety areas at the runway(s) ends, consistent with current criteria.

TAXIWAY CONSIDERATIONS

Taxiways are primarily constructed to facilitate aircraft movements to and from the runway system. The availability of entrance and exit taxiways can affect the overall airfield efficiency. While previous planning efforts have considered the potential addition of a parallel taxiway and connection to Runway 27, it is not considered essential at this time since the number of operations in peak periods on this runway are expected to remain at acceptable levels throughout the planning period. However, the potential addition of holding aprons at each end of Runway 14-32 will improve airfield operating efficiency.

Holding aprons allow aircraft to prepare for departure in an area which is not disruptive to other departing aircraft. Piston-powered aircraft generally need more time for departure than jet aircraft. However, commercial aircraft are frequently held on the taxiway when weather or flow control create delays at a destination airport. This can be a frequent occurrence at Medford during poor weather conditions. Holding aprons allow the cleared traffic to depart without further delay.

As mentioned in previous paragraphs, Taxiway A should be realigned at the south end of the airfield to maintain 400 feet of separation from the runway.

The runway and taxiway improvements have been depicted graphically on **Exhibit 4B**. It should be noted that the length of the future parallel runway is slightly greater than 4,500 feet (which was identified in the previous chapter) to provide a better connection point with the main runway.

AIR TRAFFIC CONTROL TOWER RELOCATION

Alternative locations for the control tower have been evaluated in previous planning studies. A location on the west side, between the terminal

building and Jet Center has been recommended in a *Final Site Selection Report, June 10, 1999.* The site provides excellent unobstructed line-of-sight to all major approach and ground operation surfaces. The shadowing from this site is considered acceptable. The recommended site is depicted on an exhibit later in this chapter. It has been recommended that the cab floor height be located 60 feet above the ground.

TERMINAL DEVELOPMENT ALTERNATIVES

The passenger terminal complex consists of the passenger terminal building, ground access, parking, and support facilities. A series of alternatives for terminal building expansion and redevelopment of the terminal roadway were considered in the last master plan in 1993. The plan recommended a redevelopment and expansion of the terminal building parallel with Runway 9-27, to avoid the tail height restrictions which are currently a problem at the terminal's current site as it faces Runway 14-32. The facility needs evaluation in this update has confirmed the need to plan for additional functional areas within the terminal, and to provide for additional vehicular parking areas. The size of these functional areas will increase with increasing passenger growth, although the number of carriers, leasing conditions, and tenant preferences will affect the extent of future expansions. First, a review of the three terminal building alternatives considered in the last plan will be provided, then refinement options will be examined for the current planning effort. The previous terminal expansion alternatives are depicted on **Exhibit 4C.**

The first alternative considered in the 1993 plan provided for a new ticketing and bagclaim wing parallel to Runway 9-27, and tied the new structure to the existing building (which would be converted to administration space, since the existing administration building would need to be razed). This alternative effectively eliminated aircraft parking restriction problems, but required that Jet Center facilities be relocated. It would also interfere with current plans for control tower relocation. The 20-year development cost was $7.6 million.

The second alternative (which was subsequently recommended) provided for expansion of second-level boarding parallel to Runway 9-27, maintaining gate positions parallel to Runway 14-32 for smaller commuter aircraft only. Ticketing and bag claim areas would be expanded at each end of the building to meet demands, and airport administration would not need to be relocated. The plan would not affect Jet Center, and would not interfere with current plans for the control tower relocation. The 20-year development cost was $5.1 million.

The third alternative provided for an entirely new terminal building, parallel to Runway 14-32, providing an additional 200 feet of separation from the runway. While not requiring relocation of Jet Center, and not interfering with the future control tower location, it would require that the

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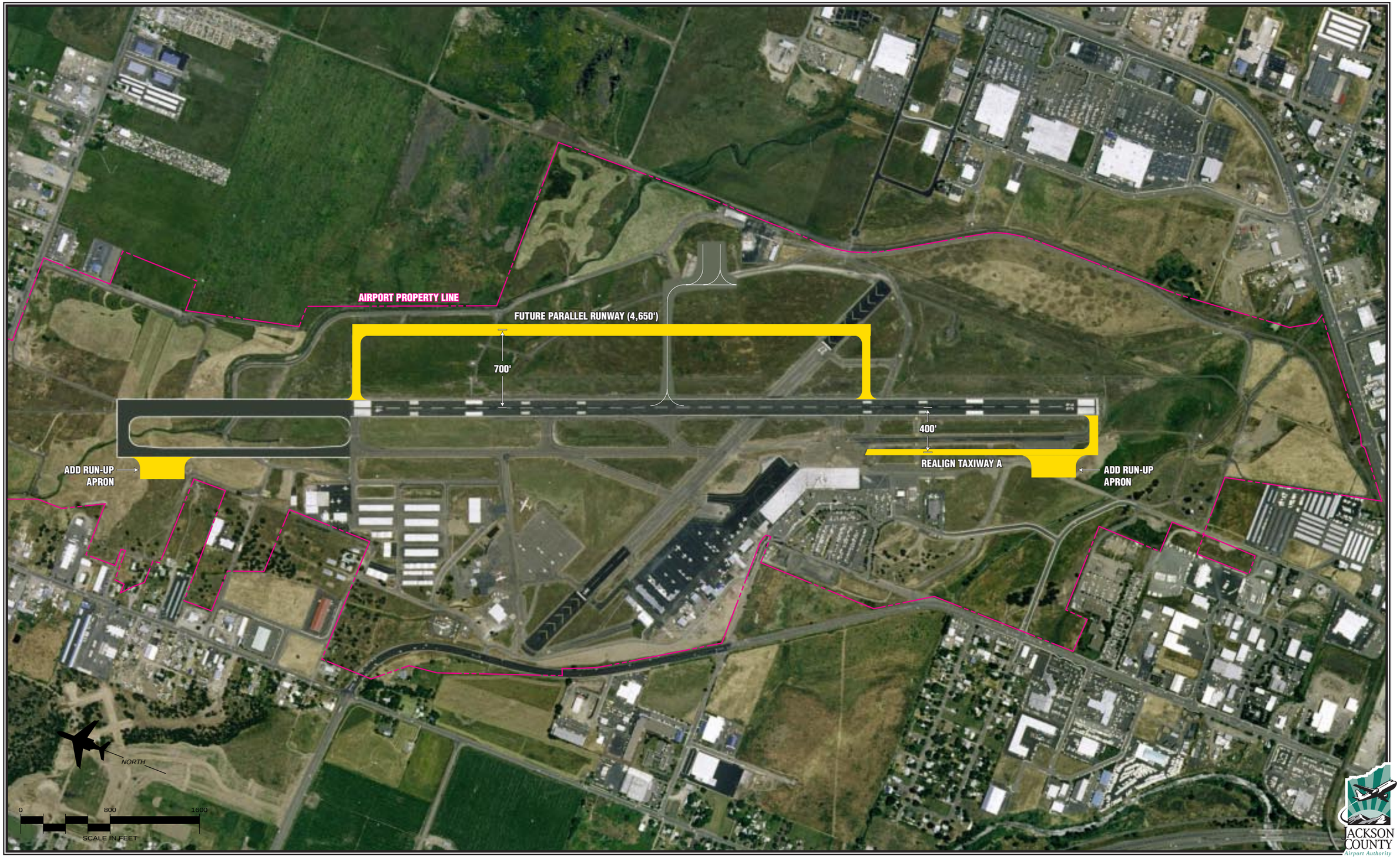

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Exhibit 4B
RUNWAY AND TAXIWAY CONSIDERATIONS

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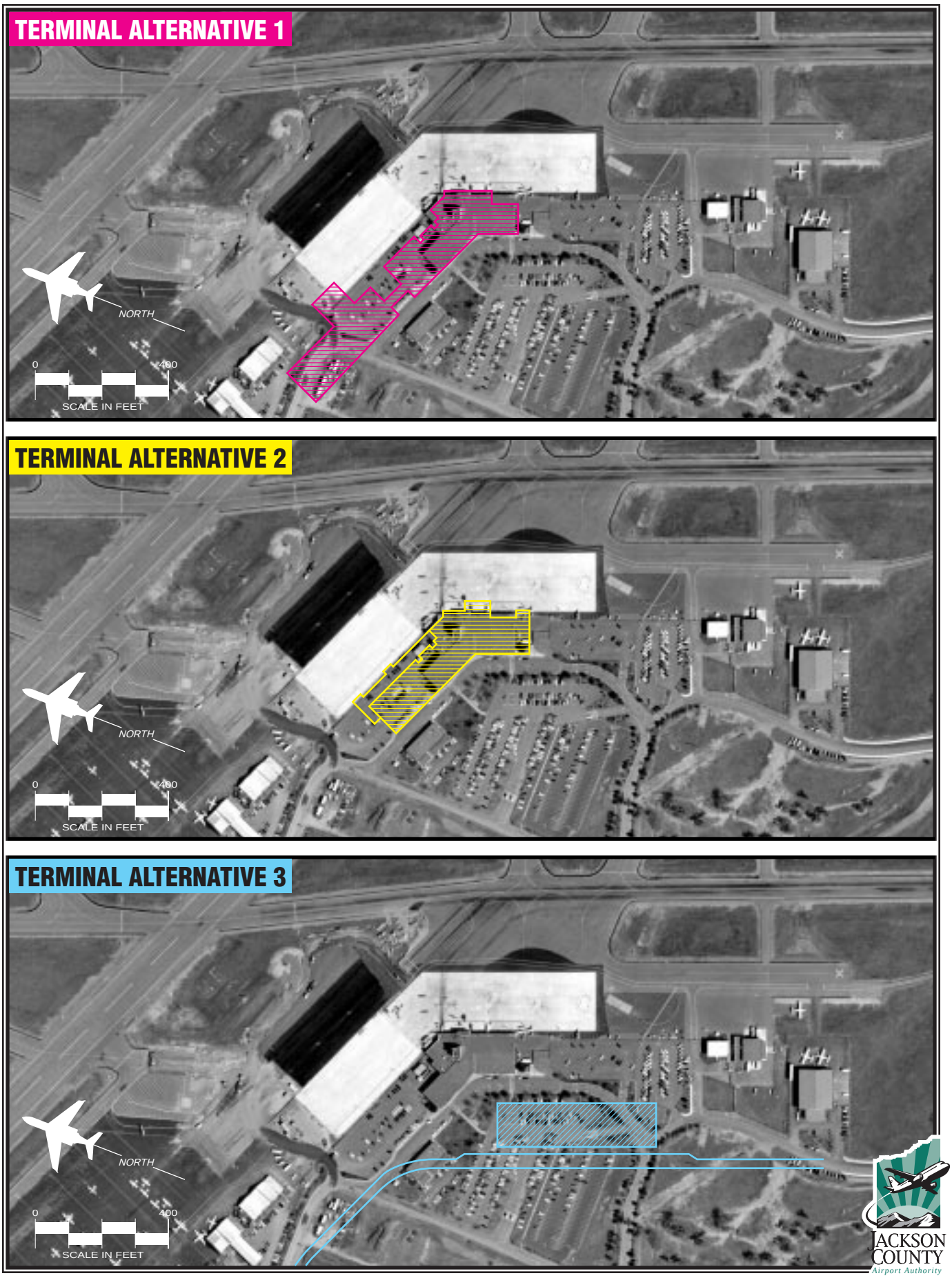

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Exhibit 4C
TERMINAL BUILDING LOCATIONAL
ALTERNATIVES - 1993 PLAN

existing administration building be razed, and the terminal entry road and curb be relocated. It would provide a linear configuration for the terminal building which could be easily expanded in the future, and would replace an aging structure initially constructed in the early 1950s. The 20-year development cost was $13.5 million.

While the development of an entirely new terminal building would solve several space deficiencies in the existing building, the cost is significant relative to other alternatives. Only the second alternative provides an expansion option which meets short-term space needs in a cost effective manner, with minimal disruption to the existing operation. It also preserves existing vehicular parking areas (although rental car ready area will be displaced).

All of the terminal access and parking alternatives considered in the 1993 plan, which are depicted on **Exhibit 4D**, assumed the purchase of the triangular shaped land parcel between the terminal area and Biddle Road (estimated at 8.76 acres). While it is still desirable for the airport to acquire this parcel, past efforts to acquire the property have been unsuccessful. Furthermore, all of the alternatives previously considered only assumed a direct aviation-related need for less than half of the property in the northeast corner.

The first alternative depicted a new terminal entrance and exit (to avoid current problems onto Biddle Road). However, the new entrance aligns with the current approach to the terminal (Terminal Way). The loop was expanded and a recirculation road was added, requiring a portion of the 9-acre land parcel. The recirculation road was also considered a frontage road, with two-way traffic. The parking lot exit was relocated to the northwest corner, allowing all terminal traffic to exit at Airport Road.

The second alternative relocated Terminal Way to a point immediately south of the current entrance, thus expanding the area inside the loop road. While reducing some of the potential commercial development areas, it provided additional parking capability within the loop, providing easier parking control. The parking lot exit was located along the recirculation road, and exiting traffic was still directed to the Airport Road intersection with Biddle Road.

The third alternative relocated Terminal Way even farther south, even with Gilman Road. This expands the loop, to meet more long-term parking demands within a single parking control area. The parking lot exit booth is placed along the recirculation road and all exiting traffic was still directed to Airport Road.

The fourth alternative merged several features of the previous two alternatives, while providing more of a "T" intersection at the exit onto Biddle Road.

Any relocation of Terminal Way (as in Alternatives 3 and 4) will create problems for access to air cargo facilities unless a frontage road is constructed to serve the facilities south of the terminal. In addition, if the terminal

expands parallel to Runway 9-27, then rental car ready area will be displaced, and likely need to be located within the terminal loop. Areas adjacent to the airport administration building will become prime property for potential rental car or public parking.

Based upon actual parking lot occupancy information provided by the Airport Authority for peak times during the holidays, nearly all available parking areas are being used (including overflow lots). Therefore, it would be reasonable to assume that the parking loop should be expanded in the short-term timeframe to expand parking areas within the parking control area. Since it can also be assumed that the 9-acre land parcel will not be available, the loop road should not extend beyond current property boundaries. Further-more, area should be contained within the loop to meet parking needs for the next five to ten years, based upon the approved forecasts.

Current public parking capacity, based upon information provided by the Airport Authority, is 433 spaces (excluding overflow, rental car and employee lots). The parking demand by 2010 is expected to be for nearly 1200 parking spaces. While a portion of the projected demand (approximately 1,000 spaces) can be met by pushing the recirculation road to the west, demand will eventually need to be met by relocating Terminal Way farther south (or providing public parking which is more remote from the immediate terminal area). Surface parking can generally be provided as distant as 1,000 feet from the terminal, without the need for shuttles. Terminal Way could be pushed as far south as the current airport entrance (as represented in previous alternatives), and still maintain acceptable walking distances to the terminal. A short-term parking and circulation concept has been depicted on **Exhibit 4E**. This will provide a new entrance point from Biddle Road, and the option to locate exiting traffic at the same point or at Airport Road. Additional coordination with local jurisdictions will be used to refine the concept.

AIR CARGO FACILITIES

Air cargo services have increased steadily over the past decade and the volume of air cargo moved through the airport has doubled over the last six years. In fact, air cargo has become the single largest growth sector at the airport throughout the 1990s. Since the airport has experienced rapid growth in activity, the facility needs are being met in more than one area. Planning by the ORE-CAL Trade Corporation is attempting to consolidate a significant portion of this activity on the east side of the airfield in the Airport Commerce Park.

A layout for Airport Commerce Park, provided to the consultants by ORE-CAL Trade Corporation, has been depicted on **Exhibit 4F**. This layout provides for the development of traditional air cargo sortation facilities, expansion of the existing cargo ramp, and future expansion potential for a total of approximately 400,000 square feet of cargo facilities.

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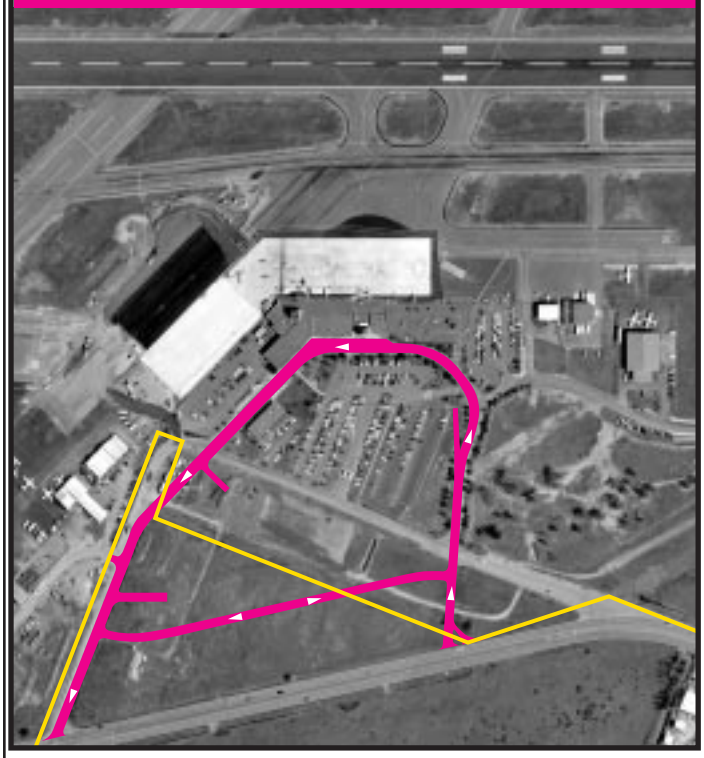
PARKING/CIRCULATION ALTERNATIVE 1



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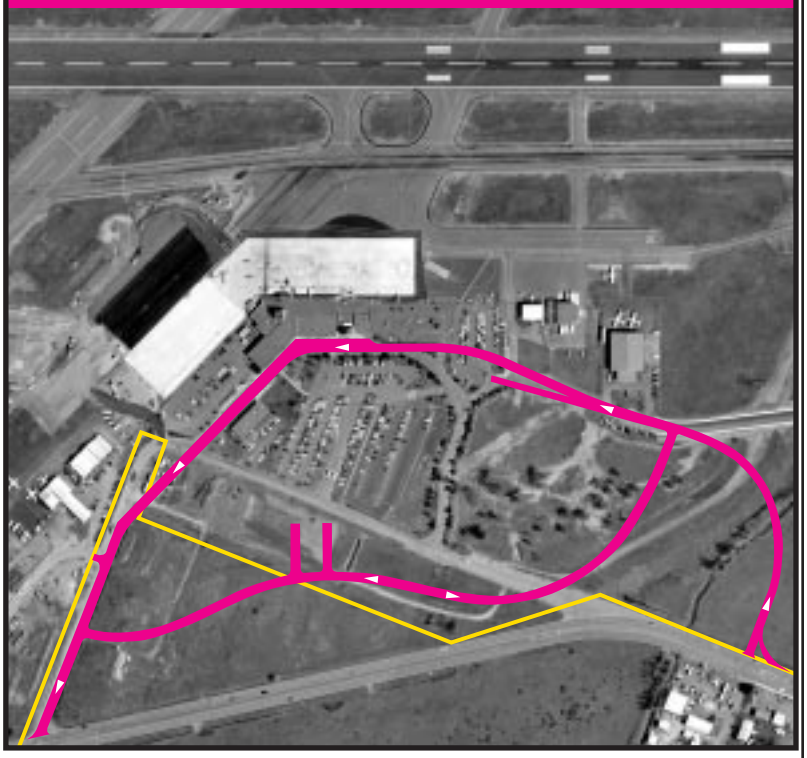

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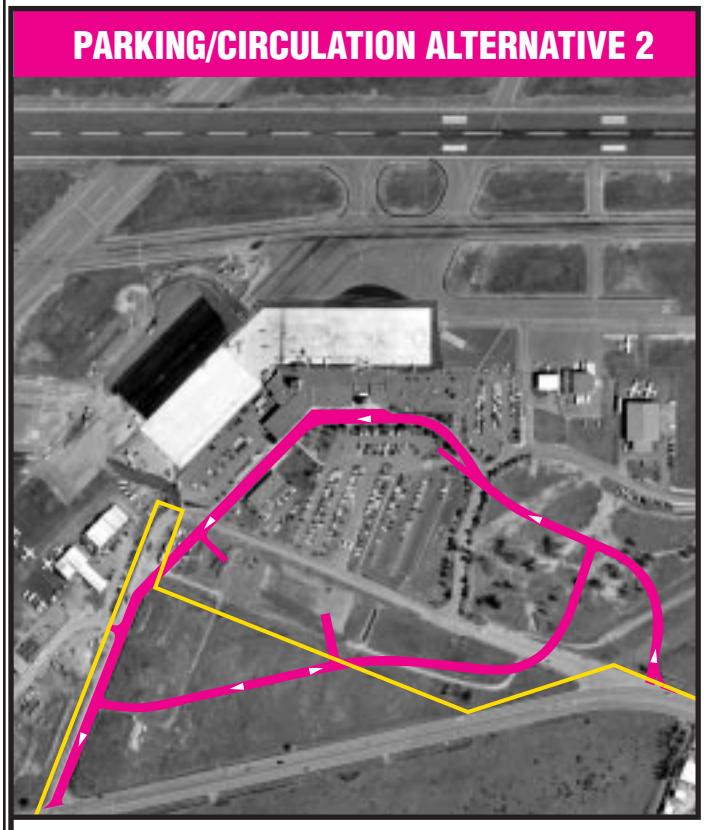

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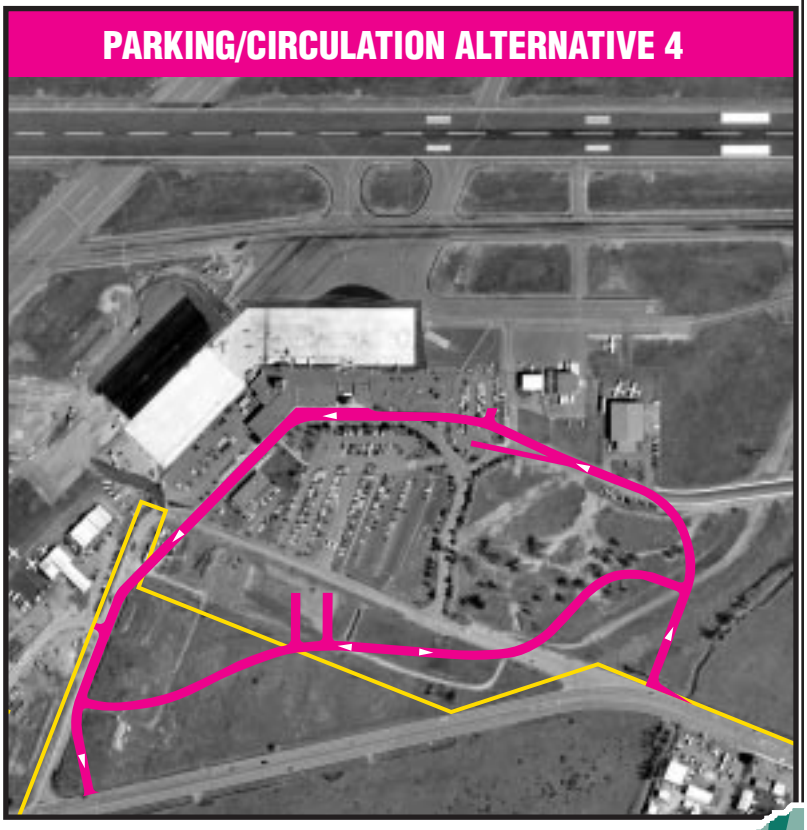

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SCALE IN FEET

NORTH

LEGEND

- Airport Property Line
- Circulation Road/Parking Entrances

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Exhibit 4D
PARKING/CIRCULATION
ALTERNATIVES - 1993 PLAN

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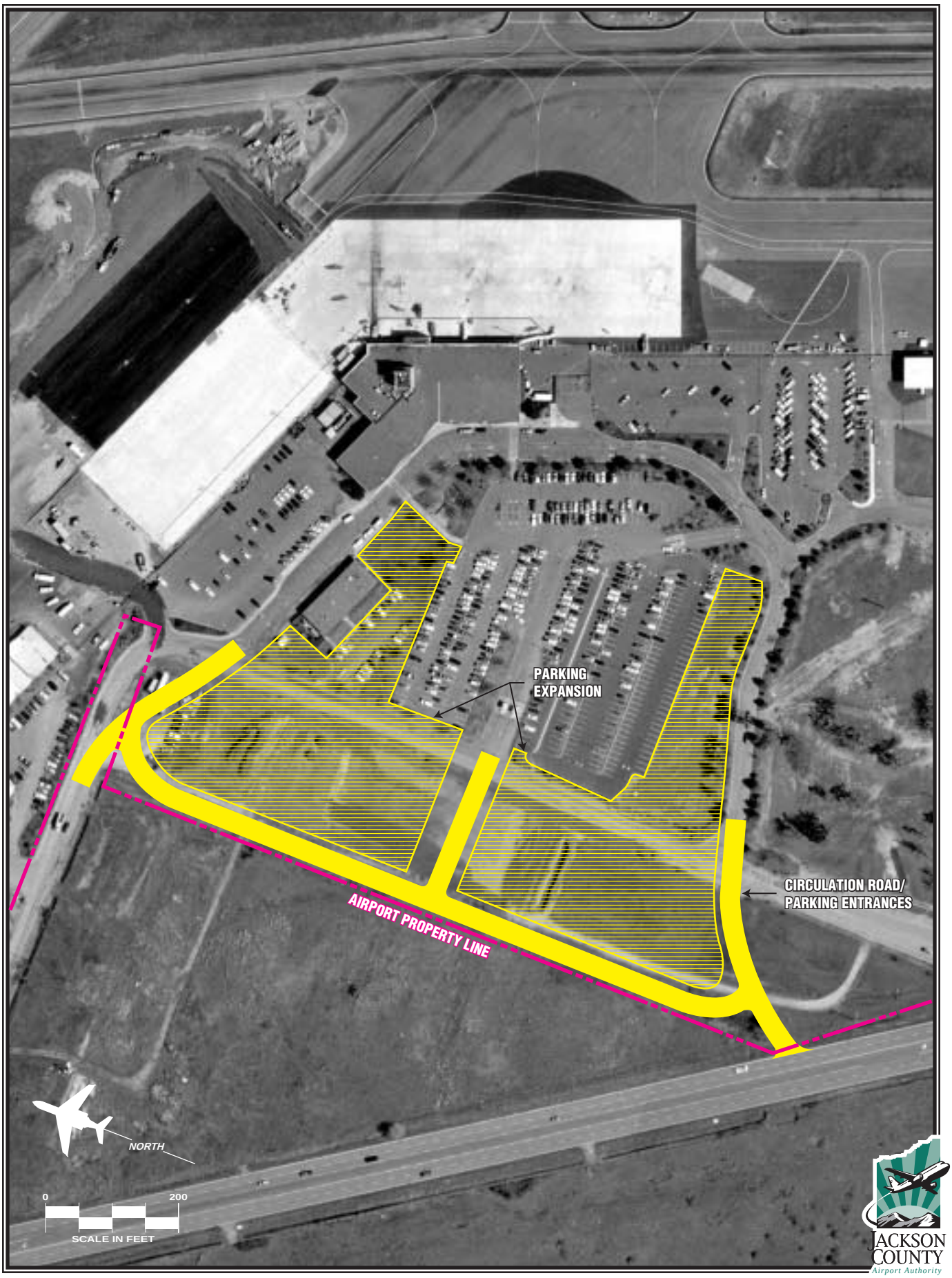

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Exhibit 4E
PARKING/CIRCULATION
ALTERNATIVE 5 - 2000 UPDATE

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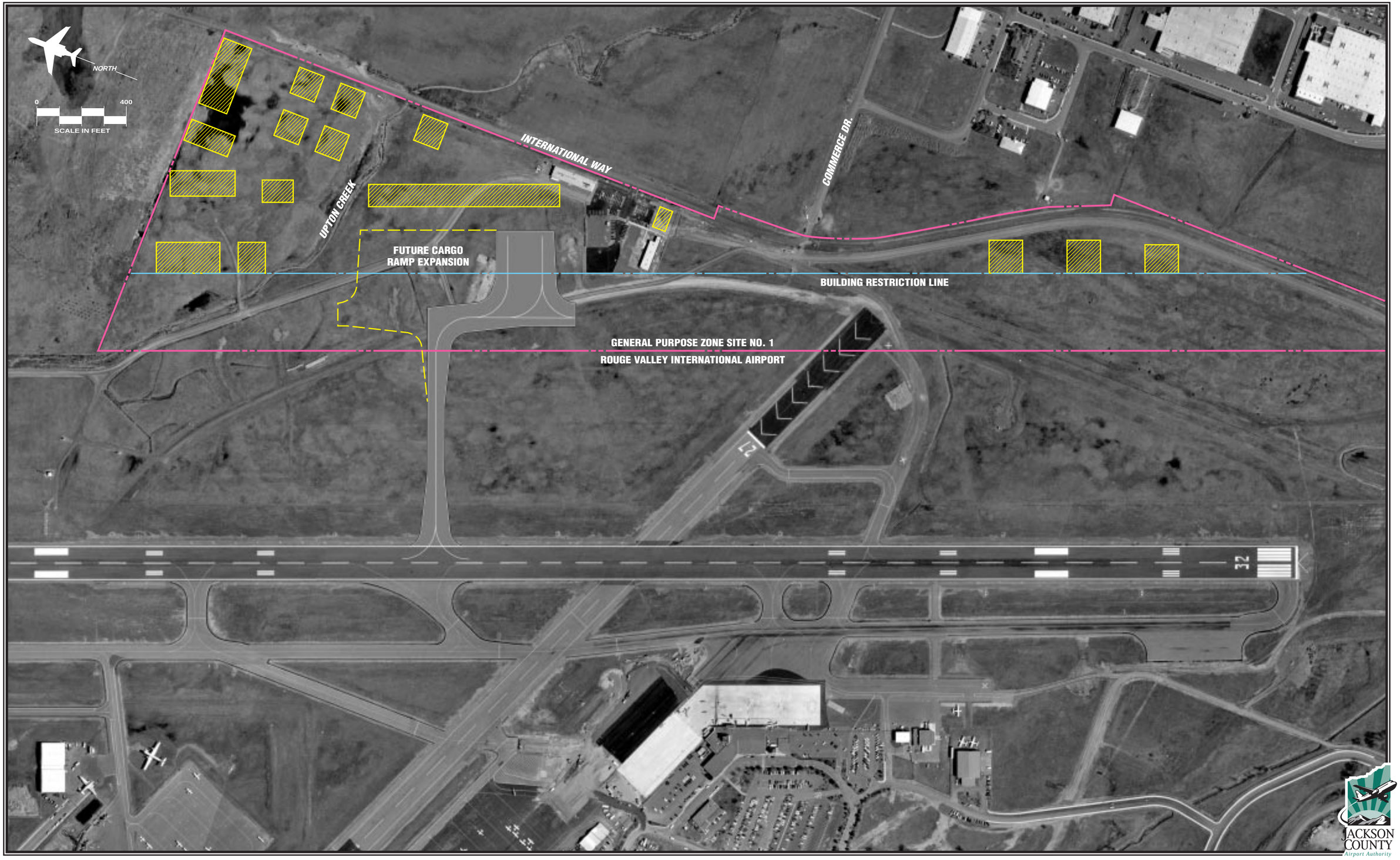

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Exhibit 4F
PROPOSED FACILITIES -
AIRPORT COMMERCE PARK

Generally, air cargo facilities should be segregated from commercial air carrier or general aviation facilities. The amount of truck and delivery van traffic which can be generated from an air cargo complex is an important consideration, as is the ability to expand apron and sortation buildings. Since the critical design aircraft are larger than other commercial aircraft in the fleet, consideration must be given to the greater wingspans and tail heights, which push the facilities farther away from the runways and taxiways.

The concept would appear to work very effectively to meet the growing air cargo demands. It does not interfere with planning for a future parallel runway. The independent evaluation being undertaken by the Airport Authority to evaluate the potential for a longer runway to serve trans-Pacific aircraft will consider potential implications with the Airport Commerce Park.

GENERAL AVIATION FACILITIES

Existing general aviation areas have limited "in-filling" potential. An area north of existing hangars along Schultz Road has recently become available with recent land purchases by the Airport Authority. This area has been recommended in past master planning for hangar storage. A proposal is currently under consideration by the Airport Authority for the area which would provide nearly 60,000 square feet of hangar storage in the area (depicted on **Exhibit 4G**). The layout depicts a mixture of individual corporate style hangars, of varying sizes to meet current aircraft storage requirements.

In addition, a two-hangar development is underway along Nebula Way which will add approximately 21,000 square feet of hangar space. The proposed layout has been depicted on **Exhibit 4H.**

Combined, these two developments will meet much of the intermediate forecast demand for conventional hangar storage on the airport. In addition, Jet Center has proposed a re-development of their facilities which would appear as depicted on **Exhibit 4J**. The new control tower facility has also been noted on this exhibit, as recommended in the tower siting study, since it will be located between the passenger terminal and Jet Center.

The potential also exists to expand general aviation facilities on the west side of the airport if Runway 9-27 is eventually closed. However, the proposed location of the control tower and the current extension of Runway 14-32 to the north will limit hangar development to areas between current aircraft tie-down ramps. Consideration will need to be given to the larger aircraft needing to access current operating areas (such as the Forest Service ramp). Given some of these uncertainties, it may be premature to design a potential redevelopment concept.

DEVELOPMENT OF NON-AVIATION PROPERTIES

Rogue Valley International Airport provides the region with several functions: commercial air services, air freight services, general aviation services, medical and law enforcement air support, and sites for the development of the commercial/industrial sector. While all but the last of these functions are directly dependent on the ability of Rogue Valley International Airport to provide facilities which meet their respective need, economic development is not specifically dependent upon the operational capabilities of the airport.

While proximity or access to airport services may be desirable for some industrial firms, most of the potential tenants will not have an aviation connection. Instead, the airport may provide a site and support services as an alternative location within the overall availability of properties that are zoned and master planned for commercial/industrial uses in the Rogue Valley area. In that sense, the airport sites compete with other locations that are developed by private firms, individuals, non-profit foundations, and other municipal agencies.

Many commercial/industrial uses that develop on airport property are airport-related (e.g. hotels, car rental companies, or service stations), but do not necessarily need to be located on airport property. They do so based upon the availability of sites, convenience, and other market considerations.

As much as practical, the non-aviation properties which develop on the property should be developed in ways that enhance the air operations and support those functions that are directly dependent upon airport services. This may include temporary uses for properties that are scheduled for future runways, taxiways, terminal, or other aviation facilities, to assure they are available for airport development when the need arises.

The Airport Authority can support a wide variety of discretionary uses on the airport, including: airport-related commercial service businesses, aviation-related business, aviation/aerospace manufacturers, non-aviation industrial/commercial uses, and low-density uses in approach/transition areas.

AIRPORT-RELATED COMMERCIAL SERVICE BUSINESSES

The airport can offer locational advantages for commercial businesses that neither support the airport operations or provide services to users of the airport, such as motels, restaurants, car rental agencies, service stations, and small executive offices that provide services and facilities for business travelers. In many locations, these businesses are accommodated in off-airport locations, especially where air transportation plays a relatively minor role in the overall commercial activity of the area. The location of the airport near the I-5/Highway 62 interchange makes it suitable for many of these uses.

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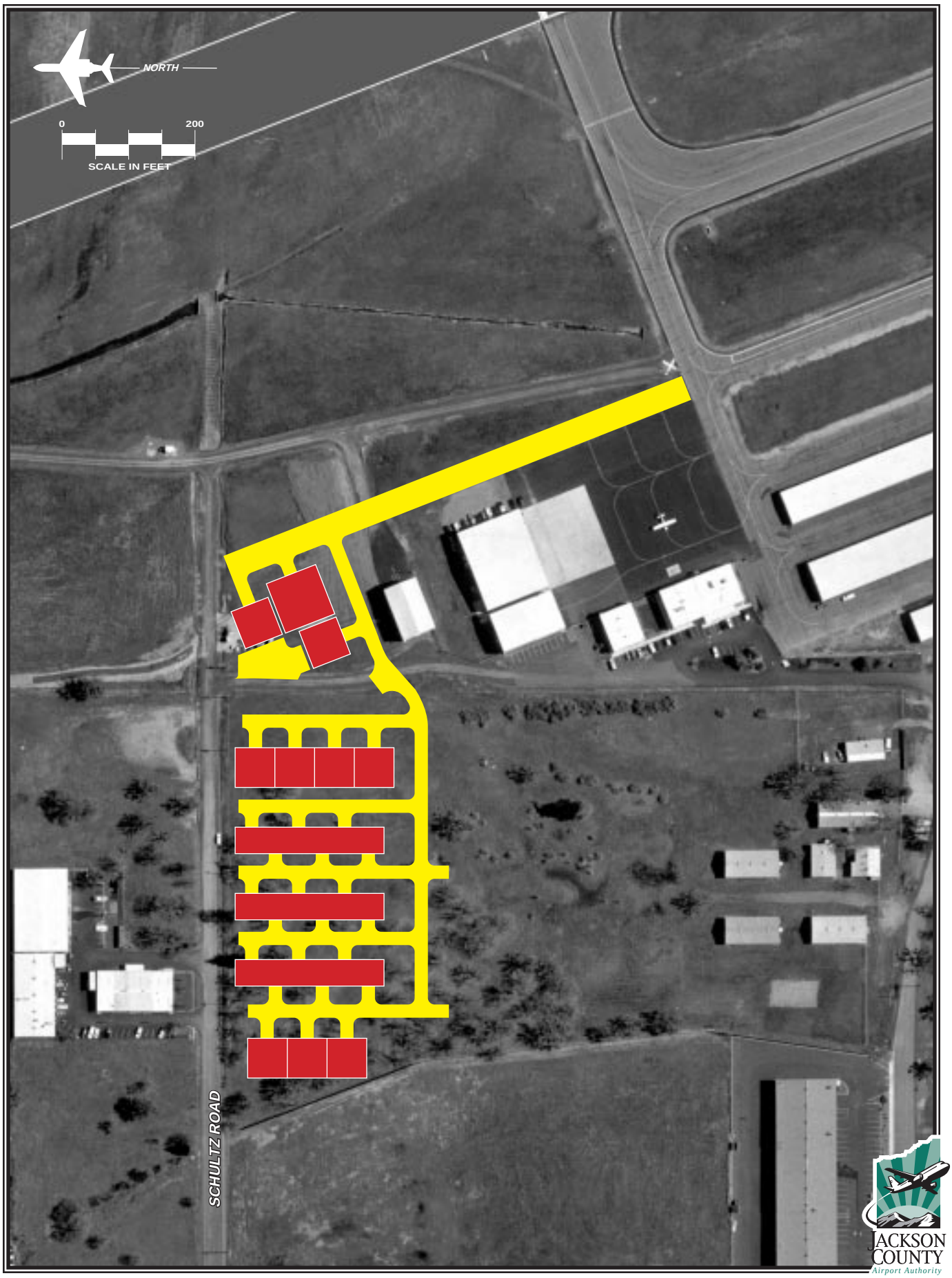

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Exhibit 4G
PROPOSED HANGAR FACILITIES-
SCHULTZ ROAD

99MP08-4H-1/20/00

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Airport Authority

Exhibit 4H
PROPOSED HANGAR FACILITIES-
NEBULA WAY

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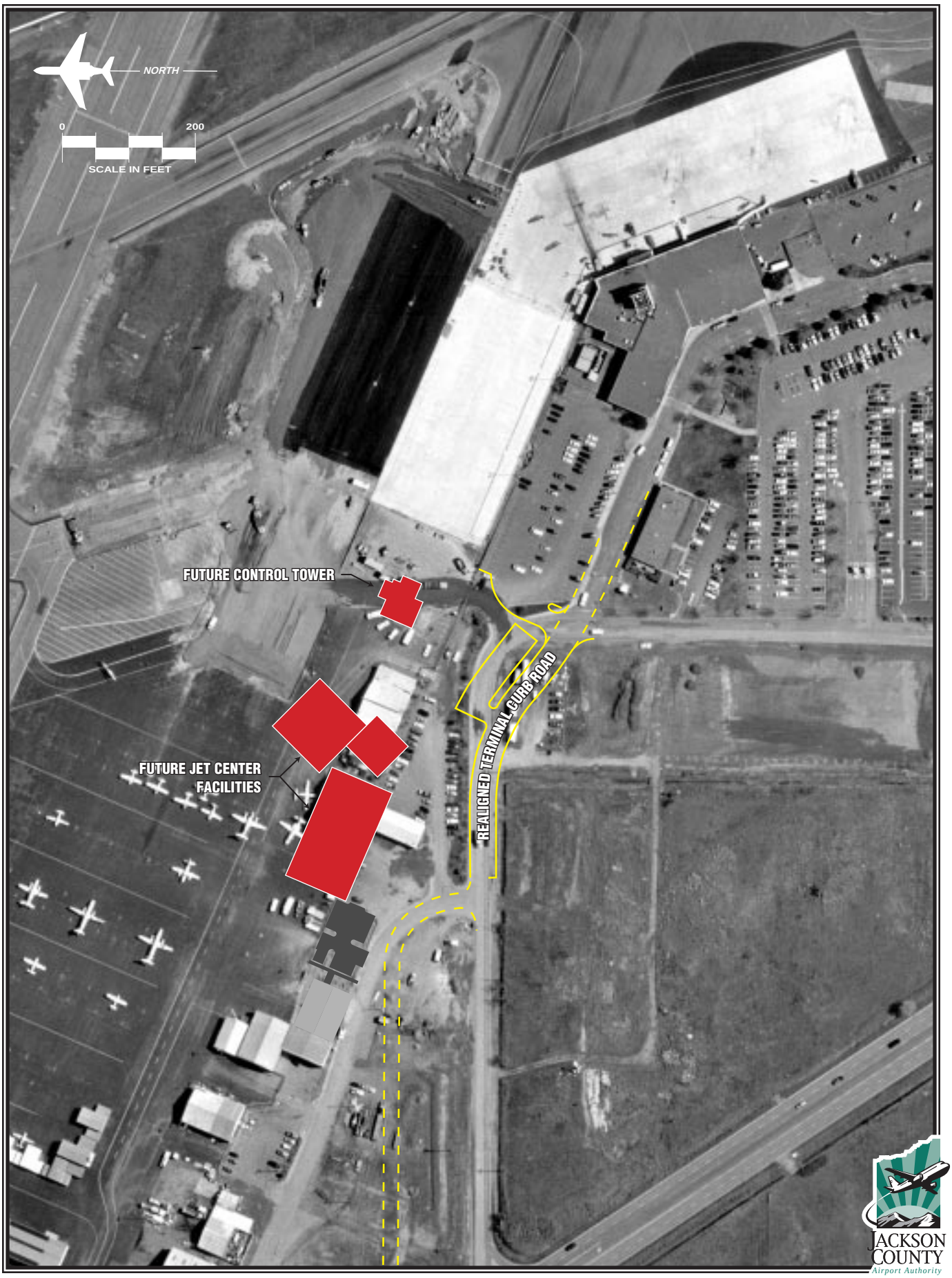


JACKSON COUNTY
Airport Authority

Exhibit 4J
PROPOSED JET CENTER/
CONTROL TOWER LAYOUT

AVIATION-ORIENTED BUSINESSES

Rogue Valley International Airport has played a key role in providing a location for these type of businesses. These firms generally required direct access to the airfield, although some firms (such as parts suppliers and avionics repair shops) often operate from locations not directly accessible to the airfield.

There are also a wide variety of companies that prefer to locate on airports because they have an orientation to aviation through their products, markets, or operations. These include many firms that operate their own aircraft in addition to using commercial air services. Several successful commercial airparks have been developed around the country.

AVIATION/AEROSPACE MANUFACTURERS

Consolidation of the industry in recent years has created fewer options for this type of operation. With the recent resurgence of general aviation aircraft manufacturing, several of these companies have opened new manufacturing plants. Typically, these companies will locate in areas with an aviation-oriented labor base. Many manufacturers of specialized parts or components do not require sites on an airport, but their aviation orientation makes an airport a preferred location.

NON-AVIATION INDUSTRIAL/ COMMERCIAL USES

While the Jackson County Airport Authority should give priority consideration in its real estate policy to firms that are aviation oriented, it should not preclude using their available properties to attract other industrial/commercial activities. Creating strong business activities near the airport will create beneficial effects and a favorable climate for the potential attraction of aviation-related companies.

LOW DENSITY USES FOR APPROACH/ TRANSITION ZONES

There are a significant number of areas falling within existing or future approach/transition zones which are not suitable for most industrial or commercial uses because of height limits or obstacle free zone criteria, especially within the runway protection zones at each runway end. A number of properties are also being acquired by the Airport Authority under the F.A.R. Part 150 Noise Compatibility Program which fall within high noise levels, precluding certain types of land use.

Many airports have been successful in developing low-density recreational facilities in approach/departure zones. Golf courses are frequently regarded as a good use in these areas, although club

houses should not be located inside the runway protection zone. Ball fields may be developed outside of the runway protection zone, although caution needs to be used when placing similar facilities in approaches to avoid potential placement of large concentrations of persons within the runway protection zones.

Caution should also be exercised before planning recreational facilities, even on an interim basis, in areas which may be needed for future aeronautical development. The required relocation of such facilities may require special environmental approvals.

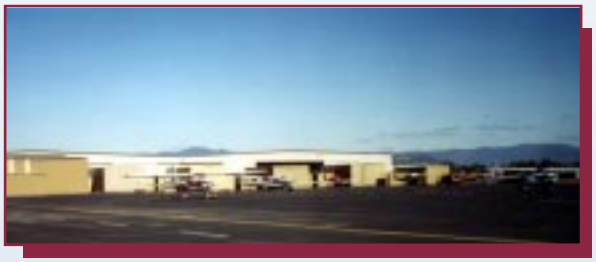
When considering potential land uses within high noise zones, consideration should be given to the land use guidelines included with the airport's approved Noise Compatibility Program, which specifies the level of noise reduction which should be included in structures, local zoning, and the general compatibility of various types of land uses.

SUMMARY

The process utilized in assessing airside and landside development alternatives involved an analysis of long-term requirements and growth potential. Current airport design standards were reflected in the analysis of runway and taxiway needs, with consideration given to the safety areas required by the FAA in runway approaches. As design standards are further modified in the future, revisions may need to be made in the plan, which could affect future development options.

Upon review of this chapter by the Jackson County Airport Authority and Planning Advisory Committee, a final master planning concept will be developed which fulfills the 20-year demands of the planning period. As any good long-range planning tool, it should remain flexible to unique opportunities which may be presented to the airport. The remaining portions of the master plan will be directed towards the refinement of the final concept, the preparation and phasing of a detailed capital improvement program, and an evaluation of funding options currently available to the Airport Authority.

AIRPORT PLANS



The airport master planning process for Rogue Valley International - Medford Airport has evolved through the development of forecasts of future demand, facility needs assessments, and the evaluation of airport development alternatives. The planning process has included the development of four working papers, distributed to a Planning Advisory Committee (PAC), and discussed at coordination meetings held throughout the study process. The coordination of the planning effort has allowed the direct input of each of these representatives into the on-going planning effort, which has resulted in the development of a master plan concept. The purpose of this chapter is to present the master planning concept in narrative and graphic form.

RECOMMENDED MASTER PLAN CONCEPT

The recommended master plan concept provides for anticipated facility needs over the twenty year planning period (and beyond). This will allow the aviation facility to meet the growing demands of commercial service, air cargo, military, and general aviation needs. In addition, the plan identifies the properties that are not anticipated for aviation-related development, and may be used for revenue enhancement.

AIRFIELD DESIGN STANDARDS

The FAA has established design criteria to define the physical dimensions of runways and taxiways, and the

imaginary clearance surfaces surrounding the airport. The design standards also define the separation criteria for the placement of landside facilities. As discussed earlier in Chapter Three, FAA design criteria is a function of the critical design aircraft or "family" of aircraft which conduct a minimum of 500 or more operations (takeoffs and landings) each year. The design category is measured by the wingspan of the aircraft, and their approach speed.

As a commercial service airport, the facility must also comply with the requirements of F.A.R. Part 139, *Certification and Operations: Land Airports Serving Certain Air Carriers.* This regulation prescribes the rules governing the certification and operation of land airports which serve scheduled or unscheduled passenger operations of an air carrier that is conducted with an aircraft having a seating capacity of more than 30 passengers. Under F.A.R. Part 139, the airport must complete (and maintain) a certification manual which outlines their compliance under each provision of the regulation. The compliance level required is dependent on the airport's design standards and the size and frequency of the scheduled aircraft service. The master plan and airport layout drawings provide a means to present this information.

All runways and taxiways which are anticipated to be available for air carrier use are required to have safety areas in compliance with F.A.R. Part 139. Runway 14-32 and associated taxiways have historically served the air carriers exclusively, and safety areas comply with F.A.R. Part 139. However, the runway-taxiway separation (at the south end) does not comply with current standards, and the taxiway will need to be relocated under a future project to obtain 400-foot separation standards.

The certification manual contains the following information on the following topics:

- General Information.
- Organization and Management.
- Airport Information.
- Maintenance and Inspection Program.
- Operational Safety.
- Hazardous Materials.
- Aircraft Rescue and Firefighting.
- Snow and Ice Control.
- Airport Emergency Plan.
- Wildlife Hazard Management.
- Maintenance of Certification Manual.

The airport will need to continually monitor their compliance with F.A.R. Part 139 in each of these areas. The capital program developed with this master plan (and included in the following chapter), will include items reimbursable under the Airport Improvement Program for the purpose of complying with Part 139.

As with most airports, runways and landside development areas are designed to differing design standards. Runway 14-32 and associated taxiways must accommodate the most demanding aircraft (minimum of 500 annual operations). The airport must be able to handle the most demanding aircraft in Design Group IV on this runway.

However, the other runways may be designed to lesser design categories. Currently, Runway 9-27 handles general aviation aircraft in Design Group I (single-engine pistons). Future runway 14L-32R is planned for Design Group II, allowing it to handle a higher percentage of general aviation aircraft (single and twin-engine pistons and turboprops).

The terminal area should be designed for Design Group IV aircraft. The general aviation areas should be designed for Group II or III aircraft. The foreign trade zone area may be expected to handle aircraft as large as a 747, but not with enough frequency to justify Design Group V standards on the airfield. **Table 5A** summarizes the design standards used for the runway/taxiway system.

AIRFIELD

The recommended master plan concept includes a series of improvements on the airfield to provide additional operational capability and capacity. The first project involves the extension of the parallel taxiway for Runway 14-32, to provide the correct 400-foot separation. An existing section of Taxiway A also needs to be widened from 60 to 75 feet. Later, a parallel runway (4,650 x 75 feet) will be added, improving the capacity of the airfield. A full-length parallel taxiway has also been shown on the east side of the airfield, should traffic generated by the foreign trade zone justify its construction.

TERMINAL AREA

One of the earliest needs in the terminal area is for additional public parking. An early project will expand the loop road, allowing for the placement of approximately 400 additional parking spaces within the loop road. Also within the short term period, the terminal building will be expanded to provide additional bag claim area, and to relocate the second-level gate positions. This expansion and reconstruction of older portions of the terminal building is anticipated to include 14,000 square feet of space. However, prior to undertaking work on the terminal building, the airport traffic control tower will be relocated northwest of the current location.

In the second phase of the terminal building reconstruction and expansion, another 14,700 square feet of ticketing, bag make-up, and administrative space will be constructed. It is anticipated that another 400 parking spaces will be added in the second phase. A project closely tied to the parking and terminal building expansion will be the reconfiguration of the Biddle Road interchange. This interchange (as it exists today) creates significant merging conflicts for traffic exiting the airport. The proposal included in this plan would create vertical separation of traffic, on property currently owned by Jackson County. Another vertical separation would be provided at the intersection with Airport Road. In addition, a relocation of Milligan Road has been shown to create depth of land parcels behind the FBOs.

TABLE 5A
Planning Design Standards

Runway Design Standards	Runway 14(R)-32(L)		Runway 9-27	Runway 14(L)-32(R) (future)
Airport Reference Code	D-IV		B-I	B-II
Approach Visibility Minimums	# One-Half Mile (14R) 1 1/4 Mile (32L)		Visual	Visual
Runway				
Width	150		100/60	75
Runway Safety Area (RSA)				
Width (centered on runway centerline)	500		120	150
Length Beyond Runway End	1,000		240	300
Object Free Area (OFA)				
Width	800		400	500
Length Beyond Runway End	1,000		240	300
Obstacle Free Zone (OFZ)				
Width	400		250	250
Length Beyond Runway End	200		200	200
Runway Centerline to:				
Parallel Taxiway Centerline	400		225	240
Edge of Aircraft Parking Apron	500		200	250
Runway Protection Zones (RPZ)	14(R)	32(L)		
Inner Width	1,000	1,000	250	500
Outer Width	1,750	1,510	450	700
Length	2,500	1,700	1,000	1,000
Obstacle Clearance	**14(R)**	**32(L)**	**9-27**	**14(L)-32(R)**
	50:1/40:1	34:1	20:1	20:1

Taxiway And Taxilane Design Standards

	ADG IV	ADG III	ADG II	ADG I
Taxiways				
Width	75	50	35	25
Shoulder Width	25	20	10	10
Safety Area Width	171	118	79	49
Object Free Area Width	259	186	131	89
Taxiway Centerline to:				
Parallel Taxiway/Taxilane	215	152	105	69
Fixed or Moveable Object	129.5	93	65.5	44.5
Taxilanes				
Taxilane Centerline to:				
Parallel Taxilane Centerline	198	140	97	64
Fixed or Moveable Object	112.5	81	57.5	39.5
Taxilane Object Free Area	225	162	115	79

Source: FAA Airport Design Software Version 4.2D

AIR CARGO AND GENERAL AVIATION

Future demand for air cargo ramp, sortation buildings, and truck transfer can be met on the east side of the airfield. It is anticipated that the construction of additional air cargo facilities will be phased to coincide with demand. All air cargo operations by heavy jets should be located on the east side of the airfield, since the pavements on the west side (and distance from the runway) preclude additional development of cargo facilities on the west side. While air cargo activities continue to be undertaken on the west side at this time, only lighter turboprop aircraft currently use the area. The east side offers the best location for further expansion of facilities and segregation of traffic.

Expansion of general aviation facilities has been shown on the west side, north of terminal facilities, in several areas. The areas may be phased to meet the specific demands that the airport experiences in the future.

AIRPORT LAYOUT PLAN DRAWINGS

The remainder of this chapter provides a brief description of the airport layout drawings that will be submitted to the FAA for review and approval. These drawings have been prepared to graphically depict the ultimate airport layout, facility development, safety areas, and imaginary surfaces that extend beyond airport property lines. The set of plans include:

- Airport Layout Drawing
- Airport Airspace Drawing
- Approach Zone and Runway Protection Zone Drawings (all runways)
- Terminal Area Drawing
- General Aviation Drawing
- On-Airport Land Use Drawing
- Airport Property Map

The layout drawings are prepared on a computer-aided drafting system to allow easier updating and revisions. New topographic mapping obtained from the City of Medford was used for the base drawings in this master plan. The set provides detailed information on existing and future facilities. The drawings set will be submitted to the FAA for approval and must reflect any future development under consideration by the FAA for potential funding Therefore, the drawings should be continually updated as new facilities are constructed.

AIRPORT LAYOUT DRAWING

The Airport Layout Drawing (ALD) graphically presents the existing and ultimate airport layout. Detailed airport and runway data is provided to facilitate the interpretation of master planning recommendations. Both airside and landside recommendations are depicted.

AIRPORT AIRSPACE DRAWING

To protect the airspace around the airport and approaches to each runway end from hazards that could affect the safe and efficient operation of aircraft

arriving and departing the airport, standards contained in F.A.R. Part 77, *Objects Affecting Navigable Airspace*, have been established for use by local authorities to control the height of objects near the airport. The Airport Airspace Drawing included in this master plan is a graphical depiction of this regulatory criterion. The Airspace Drawing is a tool to aid local authorities in determining if proposed development could present a hazard to the airport and obstruct the approach path to a runway end.

F.A.R. Part 77 Imaginary Surfaces

The Airspace Drawing assigns three-dimensional imaginary surfaces to each runway. These imaginary surfaces emanate from the runway centerline and are dimensioned according to visibility minimums associated with each runway approach and aircraft approach speeds. The Part 77 imaginary surfaces include the primary surface, approach surface, transitional surface, horizontal surface, and conical surface. Part 77 imaginary surfaces are described in the following paragraphs.

! PRIMARY SURFACE

The primary surface is an imaginary surface longitudinally centered on the runway. The primary surface extends 200 feet beyond each runway end. The elevation of any point on the primary surface is the same as the elevation along the nearest associated point on the runway centerline. Under Part 77 regulations, the primary surface for Runways 14-32 is 1,000 feet wide, while only 500 feet wide for Runway 9-27 and the future parallel runway.

! APPROACH SURFACE

An approach surface is also established for each runway. The approach surface begins at the same width as the primary surface and extends upward and outward from the primary surface end and is centered along an extended runway centerline. The approach surface for Runway 14 extends 50,000 feet from the primary surface at an upward slope of 50:1 for 10,000 feet and 40:1 for the remaining 40,000 feet. The approach surface for Runway 32 extends 10,000 feet from the primary surface at an upward slope of 34:1, while the approach surfaces for Runways 9 and 27 (and future parallel) extend 5,000 feet from the primary surface at an upward slope of 20:1.

! TRANSITIONAL SURFACE

Each runway has a transitional surface that begins at the outside edge of the primary surface at the same elevation as the runway. The transitional surface also connects with the approach surfaces of each runway. The surface rises at a slope of 7:1 up to a height which is 150 feet above the highest runway elevation. At that point, the controlling surface is the horizontal surface.

! HORIZONTAL SURFACE

The horizontal surface is established at 150 feet above the highest elevation of

the runway surface. Having no slope, the horizontal surface connects the transitional and approach surfaces to the conical surface at a distance of 10,000 feet from the primary surfaces of each runway.

- CONICAL SURFACE

The conical surface begins at the outer edge of the horizontal surface, then continues for an additional 4,000 feet horizontally at a slope of 20:1. Therefore, at 4,000 feet from the horizontal surface, the elevation of the conical surface is 350 feet above the highest airport elevation.

APPROACH ZONE AND RUNWAY PROTECTION ZONE DRAWINGS

The Approach and Runway Protection Zone Drawings, prepared for each of the runway approaches, is a scaled drawing of the runway protection zone, obstacle free zone, obstacle free area, and safety area for each runway end. The approach drawings provide plan and profile views of the entire runway approach which can assist airport authority staff, engineers, or consultants with identification of existing obstructions or potential obstructions within these areas.

TERMINAL AREA AND GENERAL AVIATION DRAWINGS

The Terminal Area and General Aviation Drawings provide greater detail of the terminal area and general aviation facilities on the west side of the airport. Recommended areas for future parking facilities in the terminal area have been noted, as have expansions of the terminal building and boarding area. Each of the areas available for expansion of general aviation facilities are shown.

ON-AIRPORT LAND USE DRAWING

The objective of the On-Airport Land Use Drawing is to coordinate uses of the airport property in a manner compatible with the functional design of the airport facility. Airport land use planning is important for the orderly development and efficient use of available space. There are two primary considerations for airport land use planning: first, to secure those areas essential to the safe and efficient operation of the airport; and second, to determine compatible land uses for the balance of the property which would be most advantageous to the airport and community. The plan depicts the recommendations for ultimate land use development on the airport, taking into consideration future runway/taxiway development. The building restriction lines are based upon ultimate layouts and line-of-sight from the future airport traffic control tower location. As future facilities are proposed on airport property, they need to be coordinated with the local FAA office.

PROPERTY MAP

The Property Map provides information on the acquisition and identification of all land tracts owned by the Jackson County Airport Authority. It denotes which properties were obtained by fee

simple title or avigation easements. It also indicates the date of acquisition for each tract and the federal aid project number. Properties recommended for purchase are also noted.

SUMMARY

The airport layout drawings are designed to assist the Jackson County Airport Authority in decision-making relative to future development. The plan considers anticipated development needs based upon forecasts developed for a 20-year planning period. Flexibility will be essential in future development as activity may not occur exactly as forecast. For this reason, areas should be reserved for terminal and air cargo facilities which exceed the expectations of this plan. The Airspace Drawing should be used by local officials as a tool to ensure land use compatibility and restrict the heights of future structures or antennae which could pose a hazard to air navigation. The drawings provide the Jackson County Airport Authority with overall direction for development, ensuring long term airport viability and services for the Rogue Valley region.

ROGUE VALLEY INTERNATIONAL - MEDFORD

AIRPORT MASTER PLAN UPDATE

January, 2001

List of Drawings

1 AIRPORT LAYOUT PLAN

2 AIRPORT DATA SUMMARY

3 TERMINAL AREA LAYOUT PLAN

4 GENERAL AVIATION PLAN

5 AIRSPACE PLAN

6 RUNWAY 14R–32L APPROACH ZONE PROFILES

7 RUNWAY 14L–32R AND 9–27 APPROACH ZONE PROFILES

8 RUNWAY PROTECTION ZONES FOR RUNWAY 14R–32L

9 RUNWAY PROTECTION ZONES FOR RUNWAY 14L–32R AND 9–27

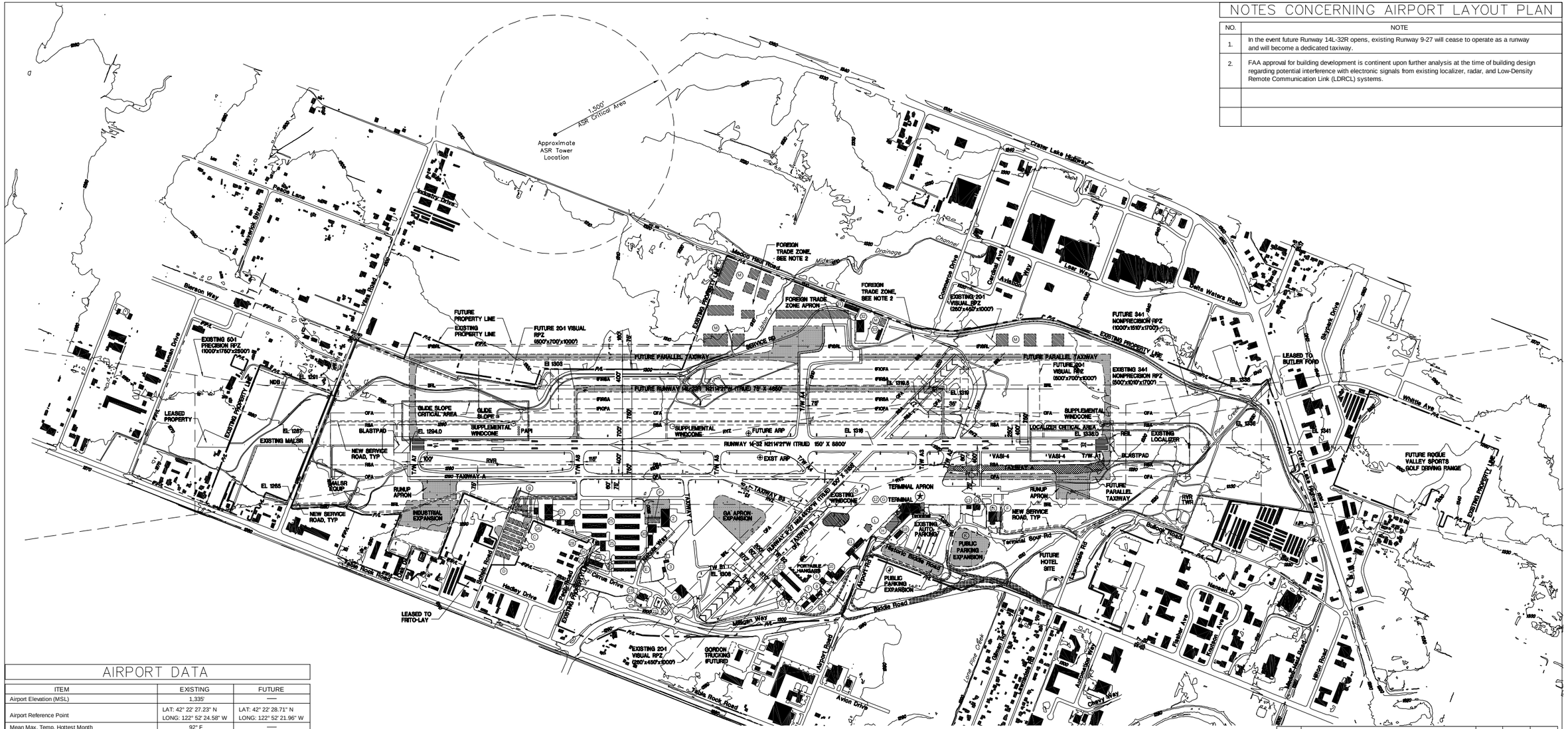
10 ON–AIRPORT LAND USE PLAN

11 AIRPORT PROPERTY MAP

The preparation of these documents was financed through Passenger Facility Charges (PFC) approved under application No. 98-04-C-00-MFR. 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 environmental acceptable in accordance with appropriated public laws.

NOTES CONCERNING AIRPORT LAYOUT PLAN

NO.	NOTE
1.	In the event future Runway 14L-32R opens, existing Runway 9-27 will cease to operate as a runway and will become a dedicated taxiway.
2.	FAA approval for building development is continent upon further analysis at the time of building design regarding potential interference with electronic signals from existing localizer, radar, and Low-Density Remote Communication Link (LDRCL) systems.



AIRPORT DATA

ITEM	EXISTING	FUTURE
Airport Elevation (MSL)	1,335'	—
Airport Reference Point	LAT: 42° 22' 27.23" N LONG: 122° 52' 24.58" W	LAT: 42° 22' 28.71" N LONG: 122° 52' 21.96" W
Mean Max. Temp. Hottest Month	92° F	—
Terminal NAVAIDs	ASR-9, Airport Beacon Wind Sock Segmented Circle Control Tower	—
Land Owned in Fee (Acres)	925 (approx.)	997 (approx.)
Avigation Easement (Acres)	21 (approx.)	—
Owner	Jackson County	—
Airport Reference Code	C-III	D-IV
NPIAS Role	Primary Commercial, Medium Haul	—

Note: All Latitude and Longitude data is based on the North American Datum of 1983. Vertical Datum Based on NAVD 88 (–) No Anticipated Change

ABBREVIATIONS

ABB.	EXPLANATION OF ABBREVIATION	ABB.	EXPLANATION OF ABBREVIATION
ASR	Airport Surveillance Radar	MITL	Medium Intensity Taxiway Lights
AZ	Azimuth Antenna	MLS	Microwave Landing System
BRL	Building Restriction Line	NDB	Nondirectional Beacon
DME	Distance Measuring Equipment	OFA	Object Free Area
EL	Elevation Antenna	PAPI-4	Precision Approach Path Indicator (4 Box)
F.T.Z.	Foreign Trade Zone	REIL	Runway End Identifier Lights
HIRL	High Intensity Runway Lights (Runway 14-32)	RPZ	Runway Protection Zone
IFR	Instrument Flight Rules	RSA	Runway Safety Area
ILS	Instrument Landing System	RVZ	Runway Visibility Zone
LIRL	Low Intensity Runway Lights	RTR	Remote Transmitter/Receiver
LOC	Localizer	TDZE	Touch Down Zone Elevation
MALSR	Medium Intensity Approach Lighting System with Runway Alignment Indicator Lights	VASI-4	Visual Approach Slope Indicator (4 Box)
		VOR	VHF Navigational Facility - Omnidirectional Course Only
MIRL	Medium Intensity Runway Lights (R/W 9-27)		

LEGEND

EXISTING	FUTURE	ITEM
PL	(F)PL	Airport Property Line
X X X	XX XX XX	Security Fence
BRL	(F)BRL	Building Restriction Line (BRL)
OFA	(F)OFA	Object Free Area
RSA	(F)RSA	Runway Safety Area
		Guidance Sign or Distance-To-Go Sign
		Airfield Pavement
		Airfield Pavement To Be Removed
		Buildings
		Windcone
		Airport Reference Point (ARP)
1300		Ground Contours (10 ft.)
		Surface Drainage
		Rotating Beacon (El. 1355)

EXISTING AIRPORT FACILITIES

NO.	FACILITY	TOP ELEV.
1	Jet Center, North	1323
2	Erickson Air Group	1320
3	United States Forest Service	1315
4	Medford Air Service Inc. (FBO)	1319
5	Superior Air Service	1334
6	Airport Maintenance Facility	1323
7	Mercy Flights	1329
8	Airport Building	1329
9	Logan & Reavis Air Inc. (FBO)	1334
10	Mercy Flights	1330
11	Jet Center - South	1336
12	Terminal Air Traffic Control Tower (to be removed)	1355 1375
13	Medford Air Cargo	1343
14	ARFF Station	1341
15	Federal Express	1340
16	Civil Air Patrol	1311
17	Jet Center - North	1323
18	Airport Administration Building	1327

EXISTING AIRPORT FACILITIES

NO.	FACILITY	TOP ELEV.
19	Weather Service (NOAA)	1323
20	Balloon Inflation Building	1313
21	Cirrus Road Facility	1313
22	Fuel Farm	1313
23	Southern Oregon Aerodrome	1327
24	Hangar	1315
25	T-Hangars (A-J)	1315
26	Conventional Hangars	1326
27	Conventional Hangars	1324
28	Conventional Hangars	1323
29	Conventional Hangar	1324
30	Conventional Hangars	1320
31	Foreign Trade Zone Storage Building	1323
32	INS Building	1329
33	FTZ Building	1331

PROPOSED AIRPORT FACILITIES

NO.	FACILITY	TOP ELEV.
A	T-Hangars (6 units each)	1320
B	Conventional Hangars (3)	1322
C	Conventional Hangars (4)	1323
D	Conventional Hangars (3)	1327
E	T-Hangar Expansion	1315
F	Federal Express Expansion	1340
G	Terminal Expansion	1355
H	Terminal Modifications	1355
J	Parking Toll Plaza	N/A
K	Parking Expansion	N/A
L	Air Traffic Control Tower	1385
M	Foreign Trade Zone Facilities	1350 - 1475
N	KC-97 Static Display	1339
P	FBO	1330

4 Acres

True North
Magnetic North
Var. 17° E (1999)

600' 0 600' 1,200'
GRAPHIC SCALE

No.	Revisions	Date	By	App'd

Drawn: GPG Checked: SCW Date: JANUARY 2001

APPROVAL

Rogue Valley International - Medford Date

FAA, Manager, Seattle Airports District Office Date

Approval Letter dated _____

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AIRPORT LAYOUT PLAN

ROGUE VALLEY INTERNATIONAL - MEDFORD
2001 AIRPORT MASTER PLAN UPDATE

DEN INC.

JACKSON COUNTY OREGON

SHEET 1 of 11

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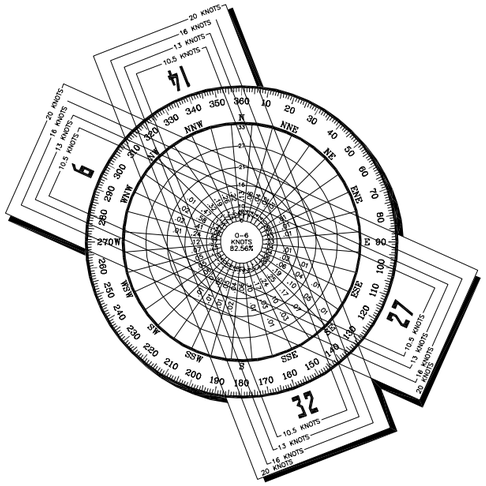
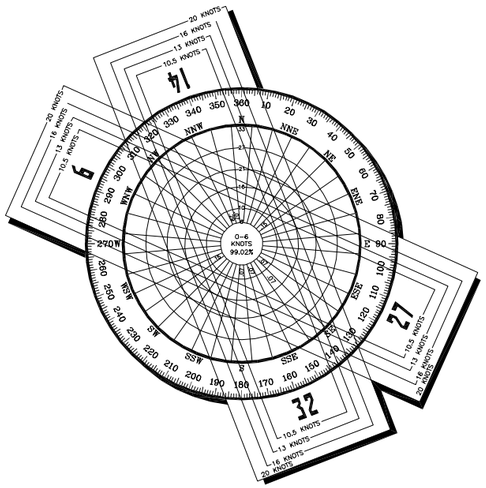
ALL WEATHER WIND COVERAGE

Runways	10.5 Knots	13 Knots	16 Knots	20 Knots
Runway 9–27	98.74%	99.46%	99.90%	99.98%
Runway 14–32	98.86%	99.57%	99.93%	99.99%
Combined	99.71%	99.90%	99.98%	100.00%



IFR WIND COVERAGE

Runways	10.5 Knots	13 Knots	16 Knots	20 Knots
Runway 9–27	100.00%	100.00%	100.00%	100.00%
Runway 14–32	100.00%	100.00%	100.00%	100.00%
Combined	100.00%	100.00%	100.00%	100.00%



NORTH

Magnetic Variance
17° 10' East (January 2001)
Annual Rate of Change
2.33' West (January 2001)

SOURCE:
NOAA National Climatic Center
Asheville, North Caralina
Rogue Valley International Airport
Medford, Oregon

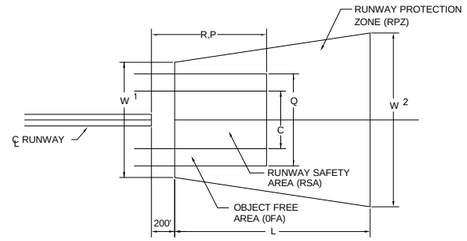
OBSERVATIONS:
81,698 All Weather Observations
1,357 IFR Observations
1990–1999

N

OFZ DATA

Runway	Runway OFZ		Inner Approach OFZ		Inner Transitional OFZ	
	Length Beyond	Width	Length	Slope	Height	Slope
14(14R)	200'	400'	2,400'	50:1	38.2	6:1
32(32L)	200'	400'	N/A	N/A	N/A	N/A
9	200'	250'	N/A	N/A	N/A	N/A
27	200'	250'	N/A	N/A	N/A	N/A
(14L)	200'	400'	N/A	N/A	N/A	N/A
(32R)	200'	400'	N/A	N/A	N/A	N/A

( ) Future



RPZ/OFA/RSA DATA

R/W	Approach Category	Approach Slope	RPZ			OFA		RSA	
			L	W 1	W 2	Q	R	C	P
14(14R)	Precision	50:1	2,500'	1,000'	1,750'	800'	1,000'	500'	1,000'
32(32L)	Nonprecision	34:1	1,700'	500'	1,010'	800'	1,000'	500'	1,000'
9	Visual	20:1	1,000'	250	450	400'	240'	120'	240'
27	Visual	20:1	1,000'	250	450	400'	240'	120'	240'
(14L)	Visual	20:1	1,000'	500'	700'	500'	300'	150'	300'
(32R)	Visual	20:1	1,000'	500'	700'	500'	300'	150'	300'

( ) Future

DECLARED DISTANCES

ITEM	RUNWAY 14(R)-32(L)		RUNWAY 9-27		RUNWAY 14(L)-32(R)	
	EXISTING		EXISTING		FUTURE	
	14(R)	32(L)	9	27	14L	32R
Takeoff Run Available (TORA)	8,800'	8,800'	3,155'	3,155'	4,650'	4,650'
Takeoff Distance Available (TODA)	8,800'	8,800'	3,155'	3,155'	4,650'	4,650'
Accelerate-Stop Distance Available (ASDA)	8,800'	8,800'	3,155'	3,155'	4,650'	4,650'
Landing Distance Available (LDA)	8,800'	8,800'	3,155'	3,155'	4,650'	4,650'

RUNWAY DATA

ITEM	RUNWAY 14(R)-32(L)				RUNWAY 9-27		RUNWAY 14(L)-32(R)	
	EXISTING		FUTURE		EXISTING		FUTURE	
	14	32	14(R)	32(L)	9	27	14L	32R
Runway Length	8,800'	8,800'	SAME	SAME	3,155'	3,155'	4,650'	4,650'
Width	150'	150'	SAME	SAME	100' / 60'	100' / 60'	75'	75'
Surface Composition	Asphalt-PFC	Asphalt-PFC	Grooved	Grooved	Asphalt	Asphalt	Asphalt	Asphalt
Approach Surface	50:1	34:1	SAME	SAME	20:1	20:1	20:1	20:1
Approach Category	Precision	Nonprecision	SAME	SAME	Visual	Visual	Visual	Visual
Design Group	C-III	C-III	D-IV	D-IV	B-I	B-I	B-II	B-II
Runway Lighting	HIRL	HIRL	SAME	SAME	MIRL	MIRL	MIRL	MIRL
Runway Marking	Precision	Precision	SAME	SAME	Basic	Basic	Basic	Basic
Taxiway Lighting	MITL	MITL	SAME	SAME	MITL	MITL	MITL	MITL
Effective Gradient (%)	0.47	0.47	SAME	SAME	0.35	0.35	0.34	0.34
Pavement Strength (x1000 lbs)	S-200,000 D-200,000 DT-400,000	S-200,000 D-200,000 DT-400,000	SAME	SAME	S-50,000 * D-70,000	S-50,000 * D-70,000	S-12,500 D-30,000	S-12,500 D-30,000
NAVAIDS:	MALSR, ILS, DME, VOR PAPI-4, GPS	REIL, VASI-4	SAME	SAME			PAPI-4	PAPI-4
Approach Visibility Minimums	CAT I	Vis. Min. ≥ 1 Mi	CAT II	Vis. Min. ≥ ¾ Mi	Vis. Min. ≥ 1 Mi	Vis. Min. ≥ 1 Mi	Vis. Min. ≥ 1 Mi	Vis. Min. ≥ 1 Mi
TDZE	1,294	1,335	SAME	SAME	1,308	1,319	1,311	1,319
Latitude	42° 23' 10.37"	42° 21' 49.35"	SAME	SAME	42° 22' 25.96"	42° 22' 13.73"	42° 22' 53.91"	42° 22' 11.10"
Longitude	122° 52' 45.06"	122° 52' 02.60"	SAME	SAME	122° 52' 45.89"	122° 52' 07.52"	122° 52' 26.43"	122° 52' 03.99"
Geodetic Azimuth (True)	158° 46' 23"	338° 46' 02"	SAME	SAME	113° 17' 09"	293° 16' 43"	158° 46' 23"	338° 46' 02"

(-) No Anticipated Change

Note: All Latitude and Longitude data is based on the North American Datum of 1983.
Vertical Datum Based on NAVD 88

* Restricted to aircraft less than 12,500 GW

AIRPORT DATA

ITEM	EXISTING	FUTURE
Airport Elevation (MSL)	1,335'	—
Airport Reference Point	LAT: 42° 22' 27.23" N LONG: 122° 52' 24.58" W	LAT: 42° 22' 28.71" N LONG: 122° 52' 21.96" W
Mean Max. Temp. Hottest Month	92° F	—
Terminal NAVAIDs	ASR-9, Airport Beacon Wind Sock Segmented Circle Control Tower	—
Land Owned in Fee (Acres)	925 (approx.)	997 (approx.)
Avigation Easement (Acres)	21 (approx.)	—
Owner	Jackson County	—
Airport Reference Code	C-III	D-IV
NPIAS Role	Primary Commercial, Medium Haul	—

(—) No Anticipated Change

Note: All Latitude and Longitude data is based on the North American Datum of 1983.
Vertical Datum Based on NAVD 88

TYPICAL CRITICAL AIRCRAFT

B-757-200 Approach Speed: 135 knots Wing Span: 124.8 ft. Length: 155.3 ft. Tail Height: 45.1 ft. Max Takeoff Wt.: 255,000 lbs. Stage Length: 4,570 NM ARC: C-IV	B-727-200 Approach Speed: 138 knots Wing Span: 108.0 ft. Length: 153.2 ft. Tail Height: 34.9 ft. Max Takeoff Wt.: 209,500 lbs. Stage Length: 2,400 NM ARC: C-III	MD-11 Approach Speed: 155 knots Wing Span: 169.8 ft. Length: 201.3 ft. Tail Height: 57.8 ft. Max Takeoff Wt.: 602,500 lbs. Maximum Range: 8,068 Miles ARC: D-IV

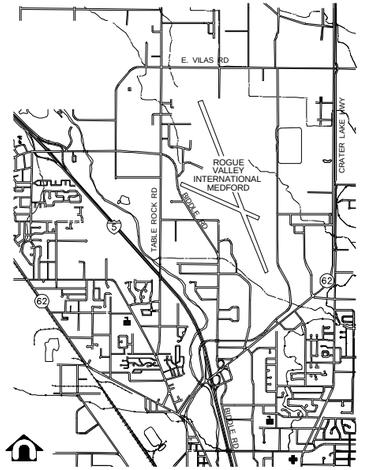
MODIFICATIONS TO FAA AIRPORT DESIGN STANDARDS

NO.	DATE GRANTED	OBSTRUCTION / DESCRIPTION	CURRENT STATUS
1		Taxiway A relocate to 400' separation	Pending

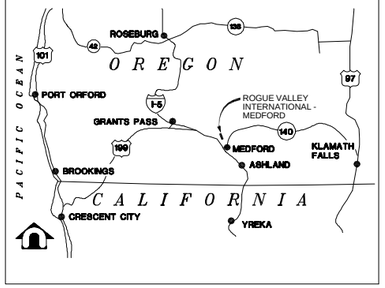
ABBREVIATIONS

ABB.	EXPLANATION OF ABBREVIATION	ABB.	EXPLANATION OF ABBREVIATION
ASR	Airport Surveillance Radar	MITL	Medium Intensity Taxiway Lights
AZ	Azimuth Antenna	MLS	Microwave Landing System
BRL	Building Restriction Line	NDB	Nondirectional Beacon
DME	Distance Measuring Equipment	OFA	Object Free Area
EL	Elevation Antenna	PAPI-4	Precision Approach Path Indicator (4 Box)
F.T.Z.	Foreign Trade Zone	REIL	Runway End Identifier Lights
HIRL	High Intensity Runway Lights (Runway 14-32)	RPZ	Runway Protection Zone
IFR	Instrument Flight Rules	RSA	Runway Safety Area
ILS	Instrument Landing System	RVZ	Runway Visibility Zone
LIRL	Low Intensity Runway Lights	RTR	Remote Transmitter/Receiver
LOC	Localizer	TDZE	Touch Down Zone Elevation
MALSR	Medium Intensity Approach Lighting System with Runway Alignment Indicator Lights	VASI-4	Visual Approach Slope Indicator (4 Box)
		VOR	VHF Navigational Facility - Omnidirectional Course Only
MIRL	Medium Intensity Runway Lights (R/W 9-27)		

VICINITY MAP



LOCATION MAP



No.	Revisions	Date	By	App'd

Drawn: GPG Checked: SCW Date: JANUARY 2001

APPROVAL

Rogue Valley International - Medford Date

FAA, Manager, Seattle Airports District Office Date

Approval Letter dated _____

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AIRPORT DATA SUMMARY

ROGUE VALLEY INTERNATIONAL - MEDFORD
2000 AIRPORT MASTER PLAN UPDATE

DEN INC.

JACKSON COUNTY OREGON

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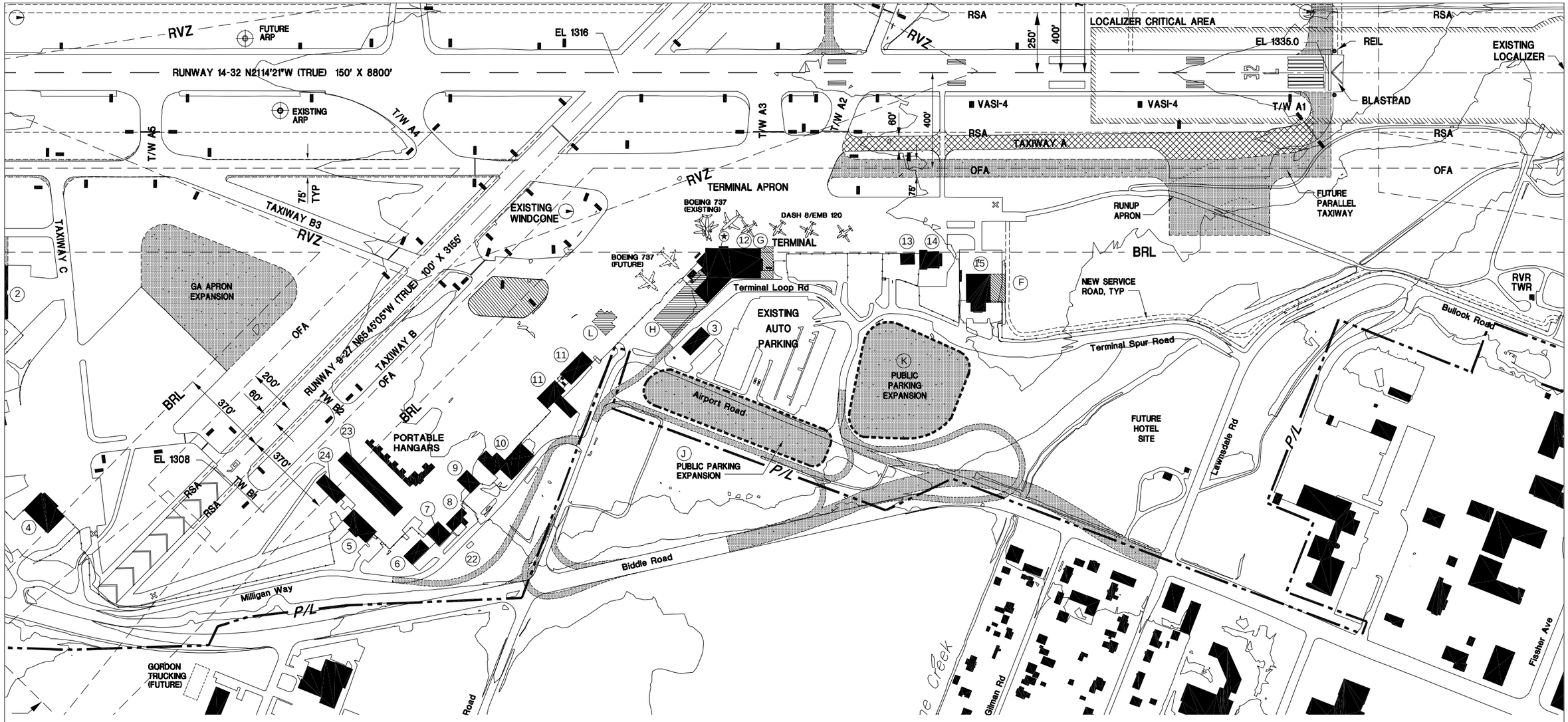

LEGEND

EXISTING	FUTURE	ITEM
PL	(F)PL	Airport Property Line
X X X	(F)X (F)X (F)X	Security Fence
BRL	(F)BRL	Building Restriction Line (BRL)
OFA	(F)OFA	Object Free Area
RSA	(F)RSA	Runway Safety Area
		Guidance Sign or Distance-To-Go Sign
		Airfield Pavement
		Airfield Pavement To Be Removed
		Buildings
		Windcone
		Airport Reference Point (ARP)
1300		Ground Contours (10 ft.)
		Surface Drainage
		Rotating Beacon (El. 1355)

EXISTING AIRPORT FACILITIES

NO.	FACILITY	TOP ELEV.
1	Jet Center, North	1323
2	Erickson Air Group	1320
3	United States Forest Service	1315
4	Medford Air Service Inc. (FBO)	1319
5	Superior Air Service	1334
6	Airport Maintenance Facility	1323
7	Mercy Flights	1329
8	Airport Building	1329
9	Logan & Reavis Air Inc. (FBO)	1334
10	Mercy Flights	1330
11	Jet Center - South	1336
12	Terminal	1355
	Air Traffic Control Tower (to be removed)	1375
13	Medford Air Cargo	1343
14	ARFF Station	1341
15	Federal Express	1340
16	Civil Air Patrol	1311
17	Jet Center - North	1323
18	Airport Administration Building	1327

EXISTING AIRPORT FACILITIES

NO.	FACILITY	TOP ELEV.
19	Weather Service (NOAA)	1323
20	Balloon Inflation Building	1313
21	Cirrus Road Facility	1313
22	Fuel Farm	1313
23	Southern Oregon Aerodrome	1327
24	Hangar	1315
25	T-Hangars (A-J)	1315
26	Conventional Hangars	1326
27	Conventional Hangars	1324
28	Conventional Hangars	1323
29	Conventional Hangar	1324
30	Conventional Hangars	1320
31	Foreign Trade Zone Storage Building	1323
32	INS Building	1329
33	FTZ Building	1331

PROPOSED AIRPORT FACILITIES

NO.	FACILITY	TOP ELEV.
A	T-Hangars (6 units each)	1320
B	Conventional Hangars (3)	1322
C	Conventional Hangars (4)	1323
D	Conventional Hangars (3)	1327
E	T-Hangar Expansion	1315
F	Federal Express Expansion	1340
G	Terminal Expansion	1355
H	Terminal Modifications	1355
J	Parking Toll Plaza	N/A
K	Parking Expansion	N/A
L	Air Traffic Control Tower	1385
M	Foreign Trade Zone Facilities	1350 - 1475
N	KC-97 Static Display	1339
P	FBO	1330

No.	Revisions	Date	By	App'd

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TERMINAL AREA LAYOUT PLAN

ROGUE VALLEY INTERNATIONAL - MEDFORD
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DEN INC.

JACKSON COUNTY OREGON

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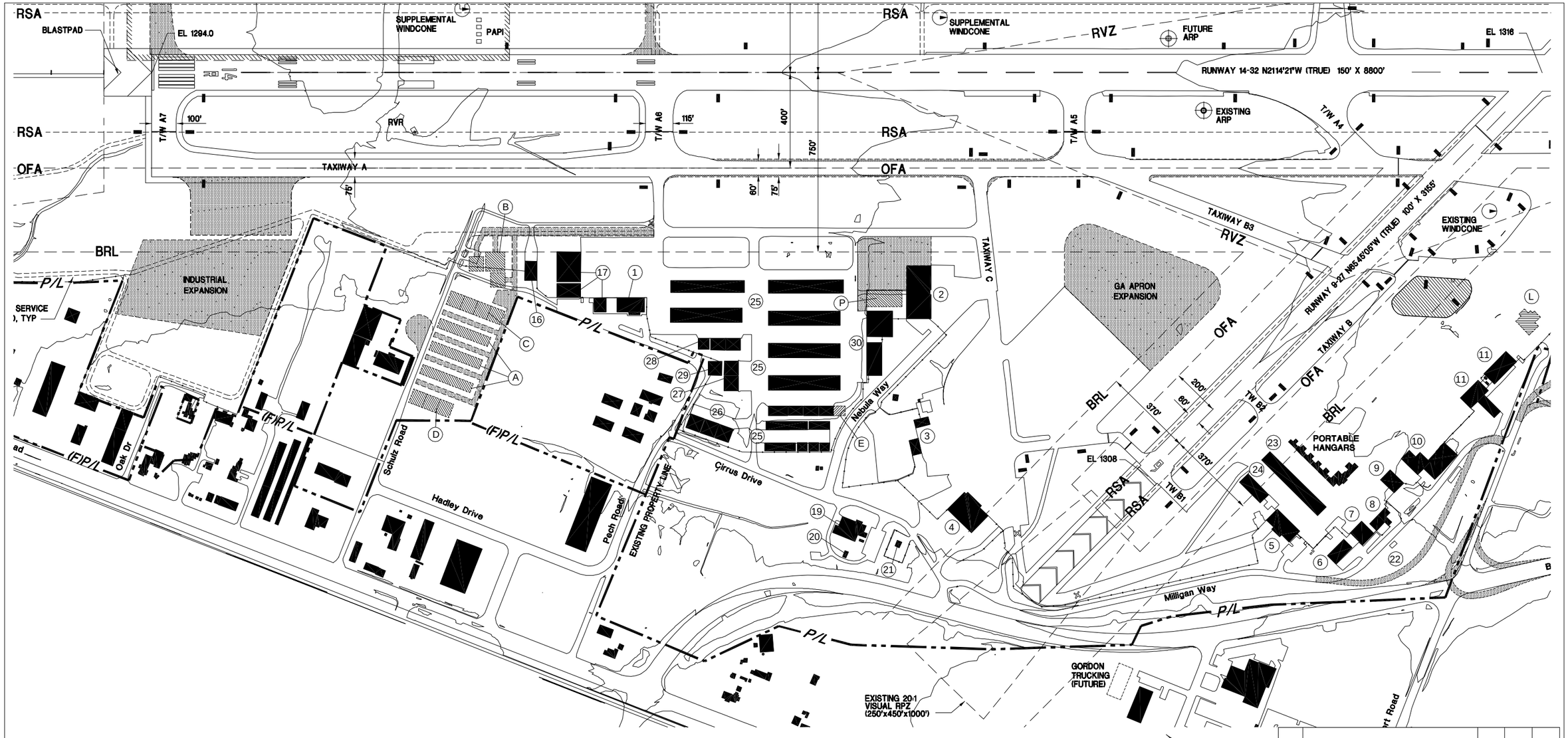

True North
Magnetic North
Var. 17° E (1999)

200' 0 200' 400'
GRAPHIC SCALE

LEGEND

EXISTING	FUTURE	ITEM
P/L	(F)P/L	Airport Property Line
x x x	xx xx xx	Security Fence
BRL	(F)BRL	Building Restriction Line (BRL)
OFA	(F)OFA	Object Free Area
RSA	(F)RSA	Runway Safety Area
		Guidance Sign or Distance-To-Go Sign
		Airfield Pavement
		Airfield Pavement To Be Removed
		Buildings
		Windcone
		Airport Reference Point (ARP)
1300		Ground Contours (10 ft.)
		Surface Drainage
		Rotating Beacon (El. 1355)

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K	Parking Expansion	N/A
L	Air Traffic Control Tower	1385
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GENERAL AVIATION AREA PLAN

ROGUE VALLEY INTERNATIONAL - MEDFORD
2001 AIRPORT MASTER PLAN UPDATE

DEN INC.

JACKSON COUNTY OREGON

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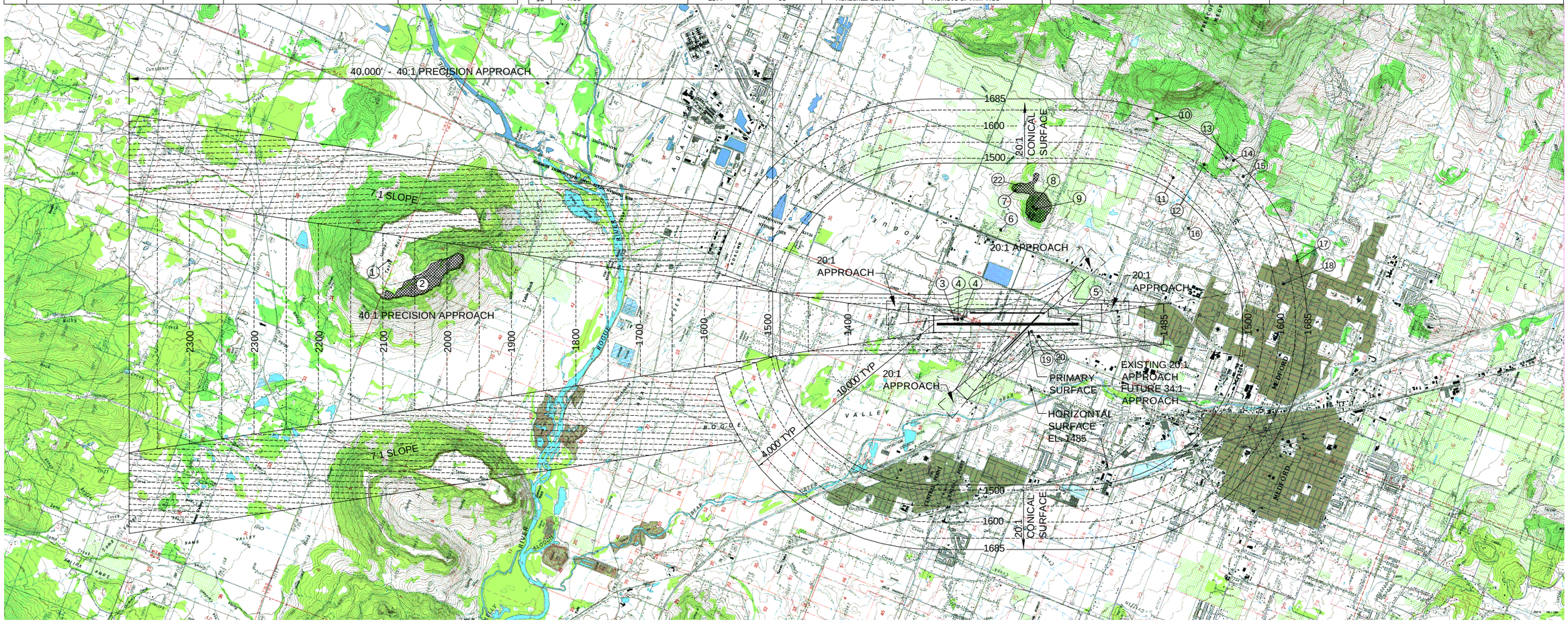
PART 77 OBSTRUCTIONS

NO.	OBJECT	TOP ELEV. (MSL)	PART 77 VIOLATION (Ft.)	PART 77 SURFACE PENETRATED	ACTION TO BE TAKEN
1	Tree	2182	138	Approach Surface	Remove or Trim Tree
2	Terrain Penetration	1975-2087	0-65	Approach Surface	
3	OL Glide Slope	1346	43	Primary Surface	Necessary NAVAID
4	Rod on OL Transmissometer	1320	15	Primary Surface	Necessary NAVAID
5	Windsock	1349	16	Primary Surface	Necessary NAVAID
6	Tree	1503	19	Horizontal Surface	Remove or Trim Tree
7	Tree	1570	86	Horizontal Surface	Remove or Trim Tree
8	Antenna	1693	209	Horizontal Surface	Necessary NAVAID

NO.	OBJECT	TOP ELEV. (MSL)	PART 77 VIOLATION (Ft.)	PART 77 SURFACE PENETRATED	ACTION TO BE TAKEN
9	Tree	1687	203	Horizontal Surface	Remove or Trim Tree
10	Tree	1830	168	Conical Surface	Remove or Trim Tree
11	Tree	1535	11	Conical Surface	Remove or Trim Tree
12	Tree	1708	93	Conical Surface	Remove or Trim Tree
13	Tree	1830	165	Conical Surface	Remove or Trim Tree
14	Building	1803	129	Conical Surface	Remove or Light
15	Power Plant Pole	1678	11	Conical Surface	Remove or Light
16	Tree	1577	93	Horizontal Surface	Remove or Trim Tree

NO.	OBJECT	TOP ELEV. (MSL)	PART 77 VIOLATION (Ft.)	PART 77 SURFACE PENETRATED	ACTION TO BE TAKEN
17	Tree	1705	21	Transitional Surface	Remove or Trim Tree
18	Antenna	1661	53	Transitional Surface	Remove or Trim Tree
19	OL on Windsock	1343	24	Transitional Surface	Necessary NAVAID
20	Antenna & Airport Beacon	1386	27	Transitional Surface	Necessary NAVAID
21	Windcone	1306	16	Primary Surface	Necessary NAVAID
22	Terrain Penetration	1660	175	Horizontal Surface	



	Revisions	Date	By	App'd

APPROVAL No.

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AIRSPACE PLAN

ROGUE VALLEY INTERNATIONAL - MEDFORD
2001 AIRPORT MASTER PLAN UPDATE

DEN INC.

JACKSON COUNTY OREGON

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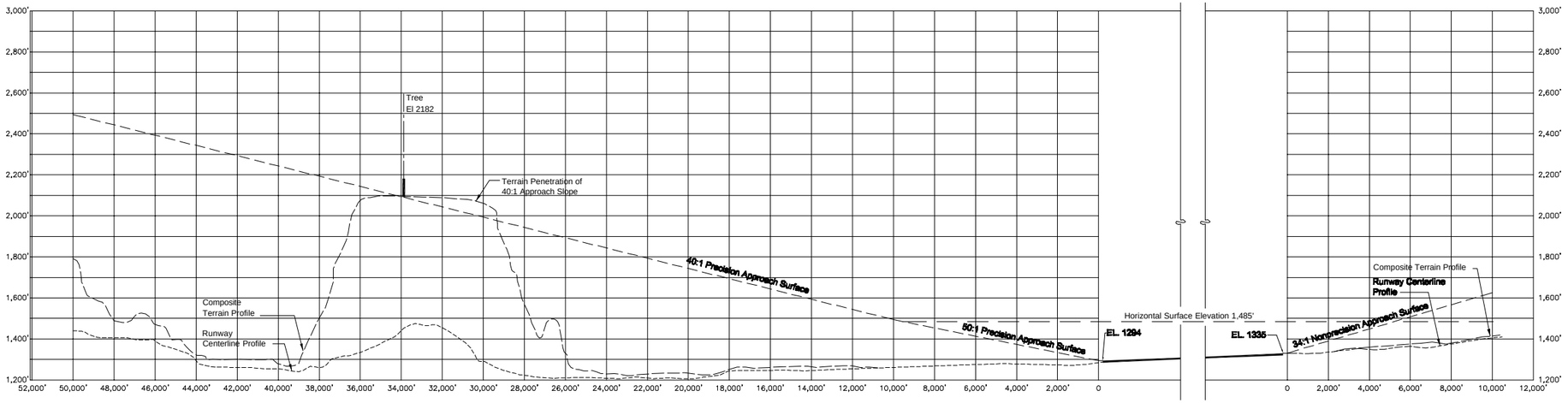
APPROACH TO RUNWAY END 14R

Horiz: 1" = 3000'

APPROACH TO RUNWAY END 32L

Horiz: 1" = 3000'



PROFILE VIEW OF RUNWAY END 14R

Horiz: 1" = 3000'
Vert: 1" = 300'

PROFILE VIEW OF RUNWAY END 32L

Horiz: 1" = 3000'
Vert: 1" = 300'

No.	Revisions	Date	By	App'd

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RUNWAY 14R-32L APPROACH ZONE PROFILES

ROGUE VALLEY INTERNATIONAL - MEDFORD
2001 AIRPORT MASTER PLAN UPDATE

DEN INC.

JACKSON COUNTY

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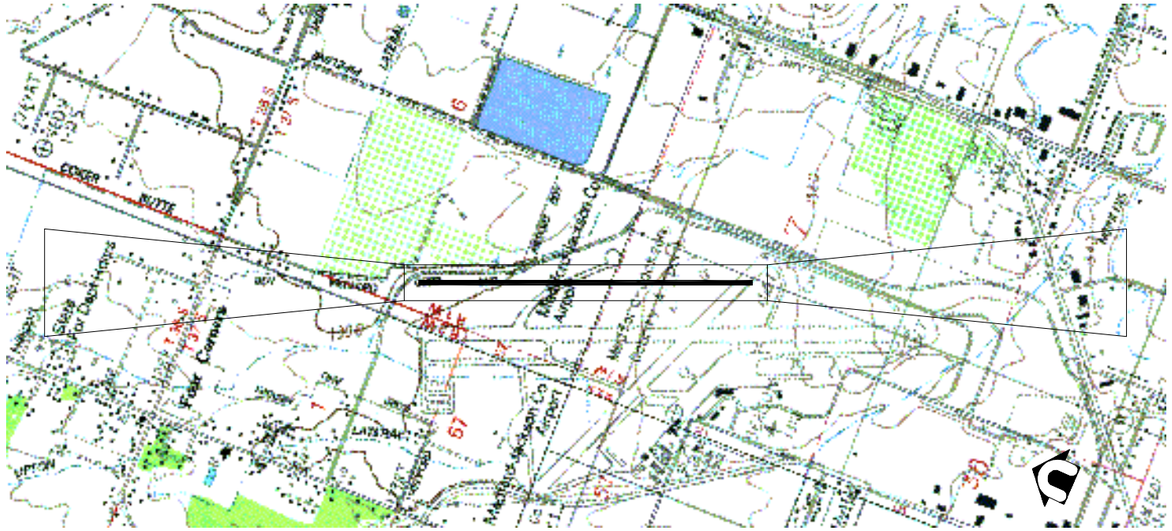
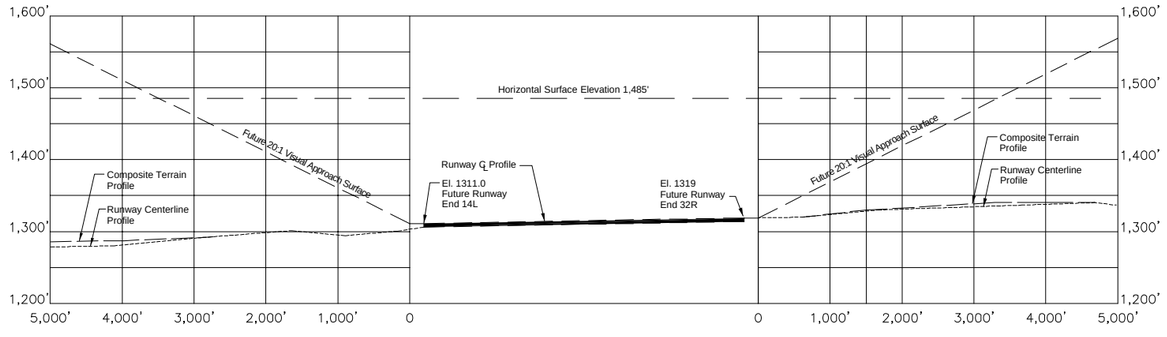


APPROACH TO RUNWAY 14L-32R

1" = 1000'

APPROACH TO RUNWAY 9-27

1" = 1000'

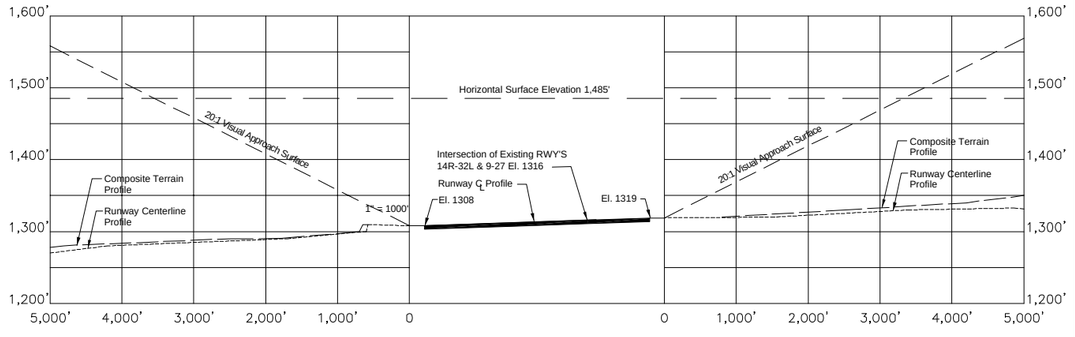


PROFILE - RUNWAY END 14L

Horiz: 1" = 1000'
Vert: 1" = 100'

PROFILE - RUNWAY END 32R

Horiz: 1" = 1000'
Vert: 1" = 100'



PROFILE - RUNWAY END 9

Horiz: 1" = 1000'
Vert: 1" = 100'

PROFILE - RUNWAY END 27

Horiz: 1" = 1000'
Vert: 1" = 100'

No.	Revisions	Date	By	App'd

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RUNWAY 14L-32R
RUNWAY 9-27
APPROACH ZONE PROFILES

ROGUE VALLEY INTERNATIONAL - MEDFORD
2001 AIRPORT MASTER PLAN UPDATE

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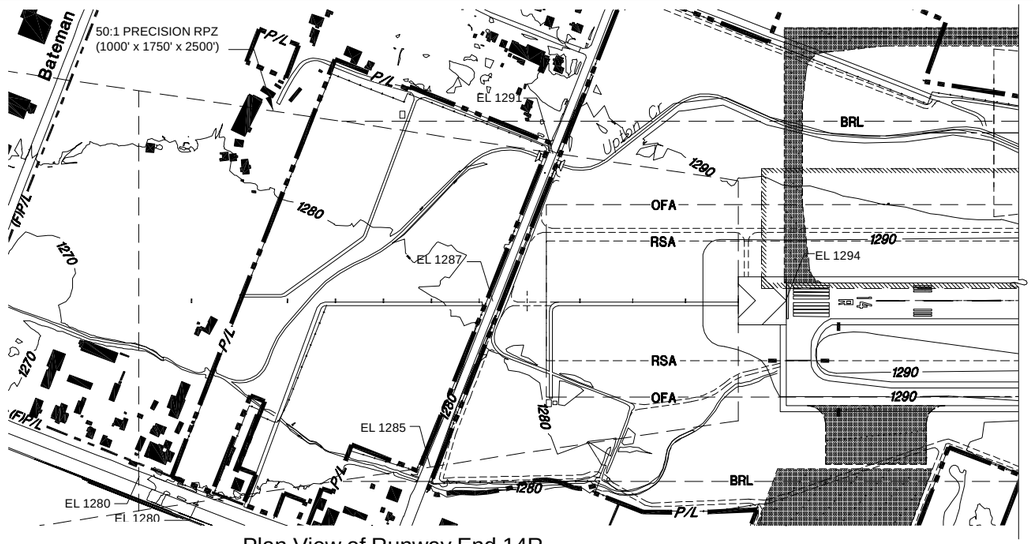
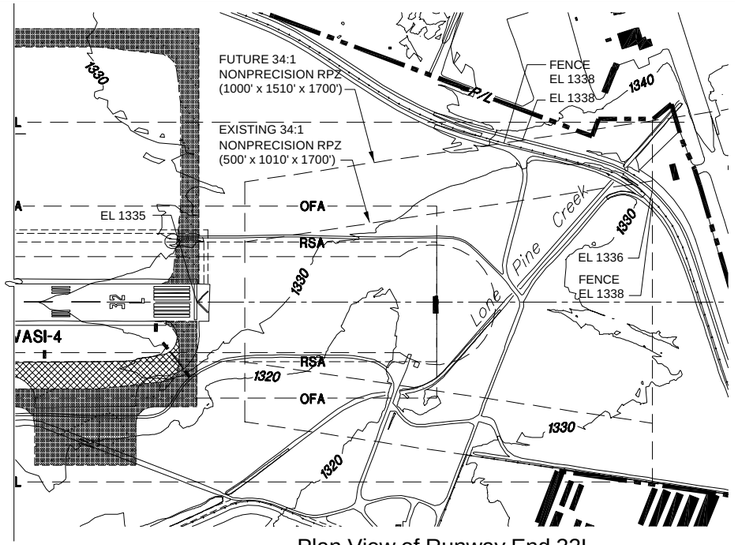


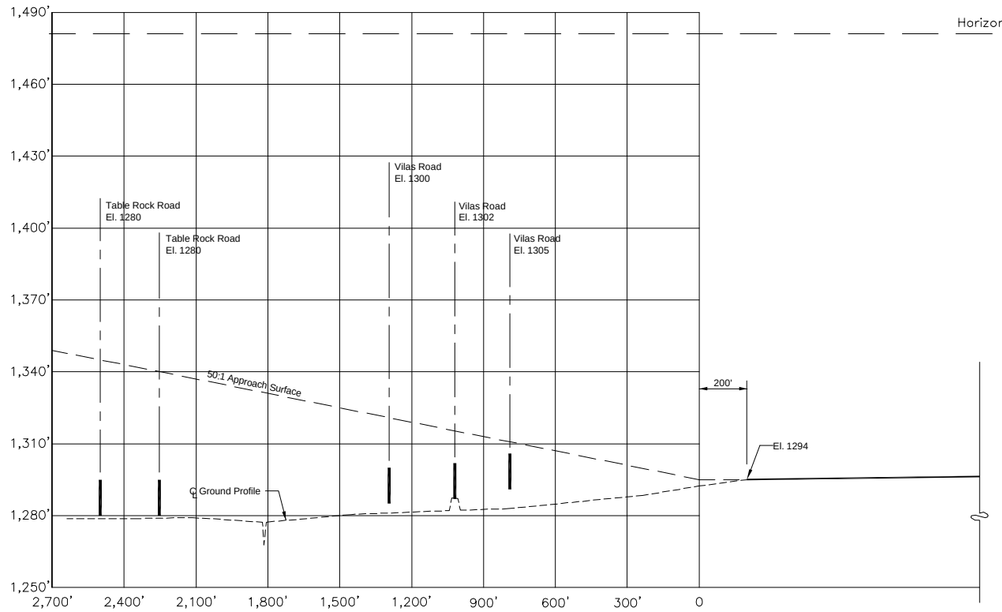
Plan View of Runway End 14R

1" = 300'



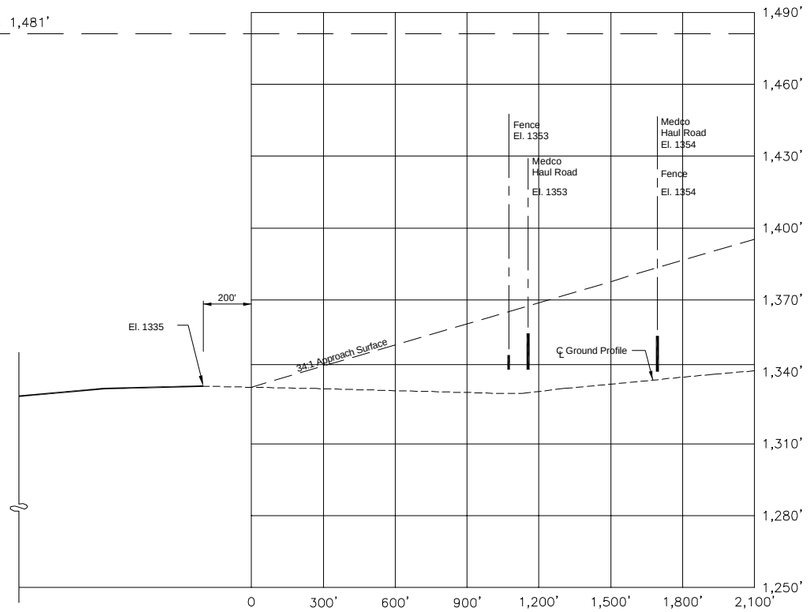
Plan View of Runway End 32L

1" = 300'



Profile View of Runway End 14R

Horiz: 1" = 300'
Vert: 1" = 30'



Profile View of Runway End 32L

Horiz: 1" = 300'
Vert: 1" = 30'

OBSTRUCTION LEGEND
RUNWAY 14R-32L

NO	OBSTRUCTION	ELEV.	VIOLATION	REMARKS
1				
2				
3				
4				
5				
6				
7				

No.	Revisions	Date	By	App'd

Drawn: GPG Checked: SCW Date: JANUARY 2001

APPROVAL

Rogue Valley International - Medford Date

FAA, Manager, Seattle Airports District Office Date

Approval Letter dated _____

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No.

RUNWAY PROTECTION ZONES
FOR
RUNWAYS 14R-32L

ROGUE VALLEY INTERNATIONAL - MEDFORD
2001 AIRPORT MASTER PLAN UPDATE

DEN INC.

JACKSON COUNTY

SHEET 8 of 11

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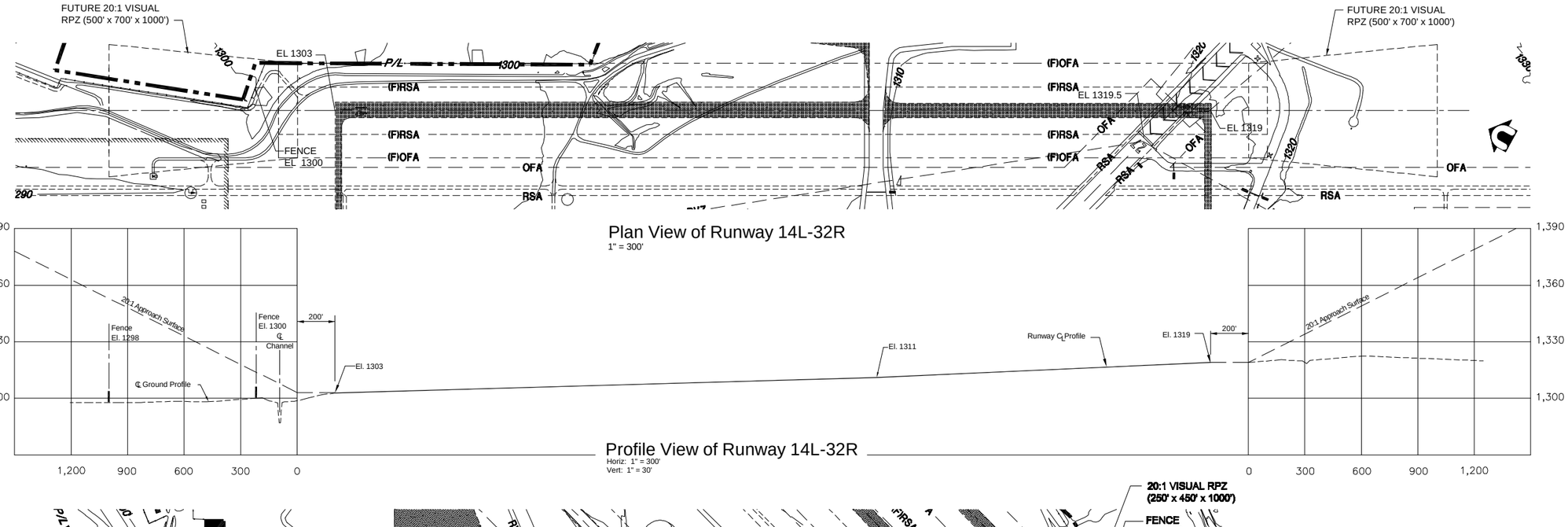
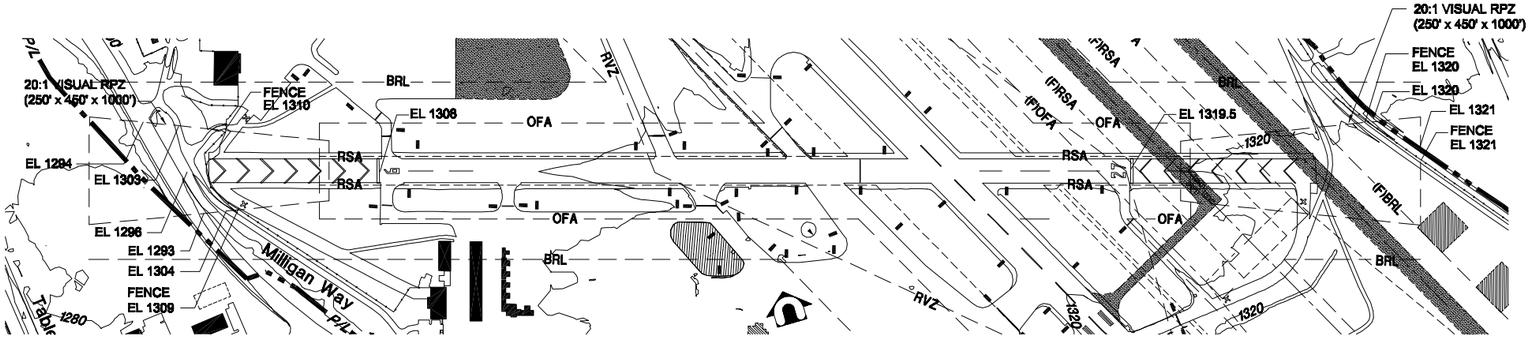
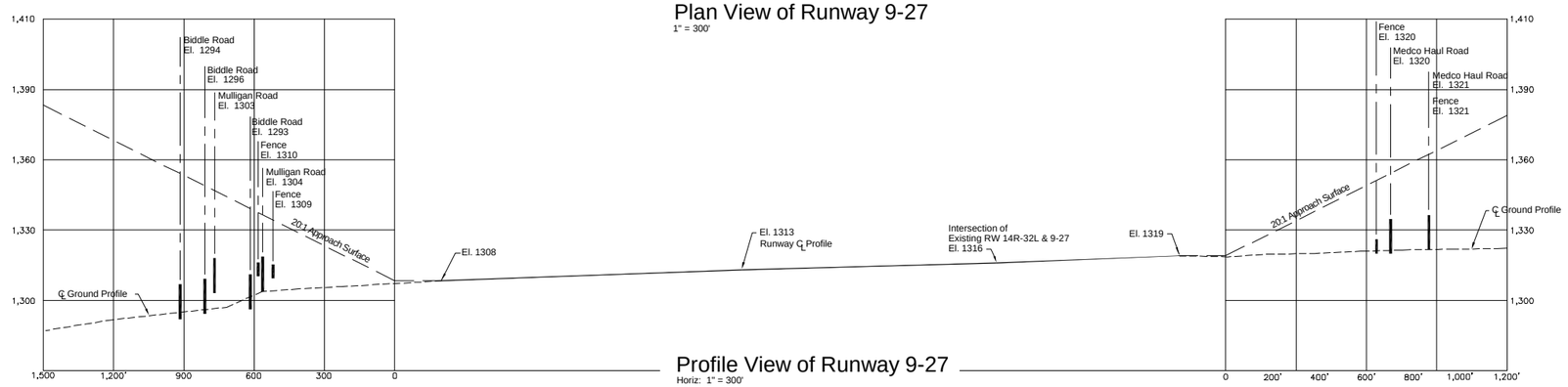


Plan View of Runway 14L-32R
1" = 300'

Profile View of Runway 14L-32R
Horiz: 1" = 300'
Vert: 1" = 30'



Plan View of Runway 9-27
1" = 300'



Profile View of Runway 9-27
Horiz: 1" = 300'
Vert: 1" = 30'

OBSTRUCTION LEGEND
RUNWAY 14L-32R

NO	OBSTRUCTION	ELEV.	VIOLATION	REMARKS
1				
2				
3				
4				
5				
6				
7				

OBSTRUCTION LEGEND
RUNWAY 9-27

NO	OBSTRUCTION	ELEV.	VIOLATION	REMARKS
1				
2				
3				
4				
5				
6				
7				

APPROVAL

Rogue Valley International - Medford Date

FAA, Manager, Seattle Airports District Office Date

Approval Letter dated _____

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No.	Revisions	Date	By	App'd

Drawn: GPG Checked: SCW Date: JANUARY 2001

RUNWAY PROTECTION ZONES
FOR
RUNWAY 14L-32R
RUNWAY 9-27

ROGUE VALLEY INTERNATIONAL - MEDFORD
2001 AIRPORT MASTER PLAN UPDATE

DEN INC.

JACKSON COUNTY

SHEET 9 of 11

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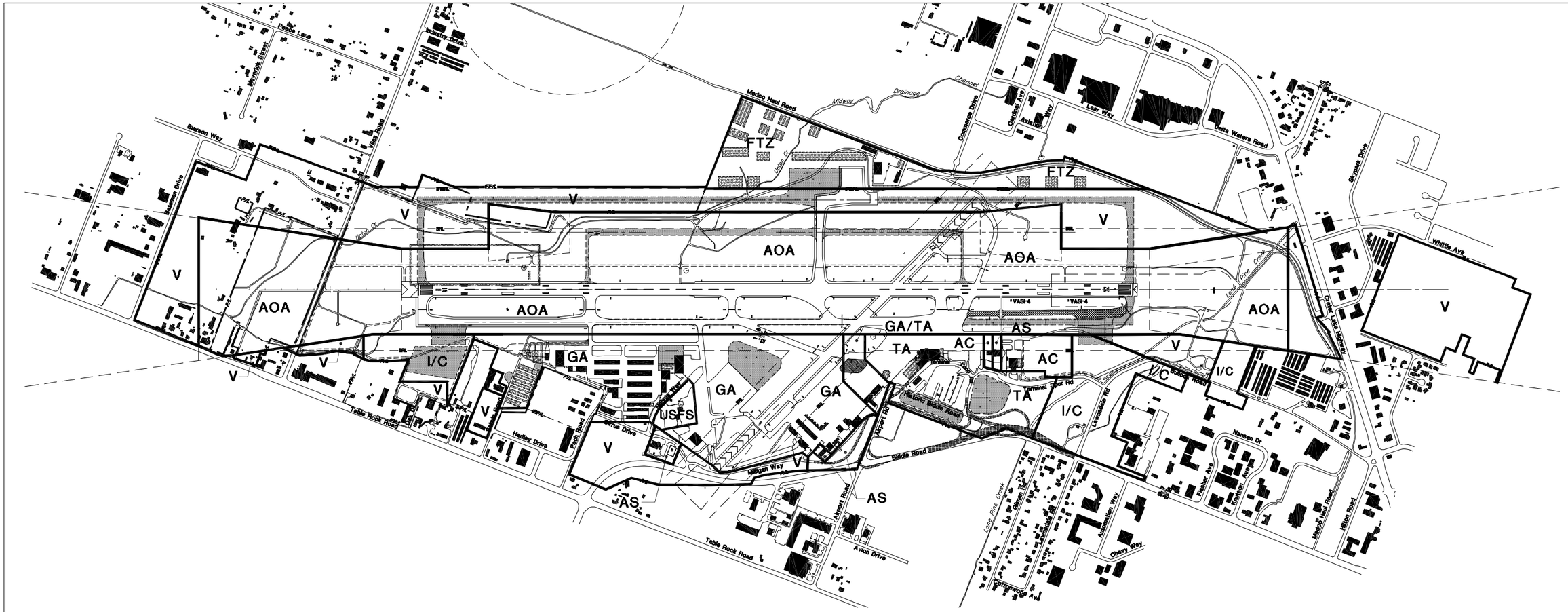

LEGEND

EXISTING	FUTURE	ITEM
PL	FPL	Airport Property Line
X X X	XX XX XX	Security Fence
BRL	FBRL	Building Restriction Line (BRL)
OFA	FOFA	Object Free Area
RSA	FRSA	Runway Safety Area
–	–	Guidance Sign or Distance-To-Go Sign
		Airfield Pavement
		Airfield Pavement To Be Removed
		Buildings
		Windcone
		Airport Reference Point (ARP)
1300		Ground Contours (10 ft.)
		Surface Drainage
		Rotating Beacon (El. 1355)

LAND USE LEGEND

AOA	AIRFIELD OPERATION AREA	AC	AIR CARGO AREA
	Runways and Taxiways Runway Protection Zones Safety Area Navaid Critical Area		Air Cargo Buildings Air Cargo Aprons
TA	TERMINAL AREA	V	VACANT AREA
	Terminal Building Terminal Apron Public Parking Terminal Access		Open and Vacant Space Environmental Buffer Areas Park and Recreational Areas
AS	AIRFIELD SUPPORT AREA	I/C	INDUSTRIAL AND COMMERCIAL AREA
	Airport Maintenance Facilities Fuel Farm Aircraft Rescue and Fire Fighting (ARFF) Facility Other		Hotels Banks Restaurants Office Buildings Industrial Buildings Other Commercial
GA	GENERAL AVIATION AREA	USFS	UNITED STATES FOREST SERVICE
	FBO Hangars Apron and Tie-Down Areas Corporate Hangars	FTZ	FOREIGN TRADE ZONE

True North
Magnetic North
Var. 17° E (1999)

600' 0 600' 1,200'
GRAPHIC SCALE

4 Acres

No.	Revisions	Date	By	App'd

Drawn: GPG Checked: SCW Date: JANUARY 2001

APPROVAL

Rogue Valley International - Medford Date

FAA, Manager, Seattle Airports District Office Date

Approval Letter dated _____

ON-AIRPORT LAND USE PLAN

ROGUE VALLEY INTERNATIONAL - MEDFORD
2001 AIRPORT MASTER PLAN UPDATE

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DEA INC.

JACKSON COUNTY

SHEET 10 of 11

PARCEL DATA TABLE

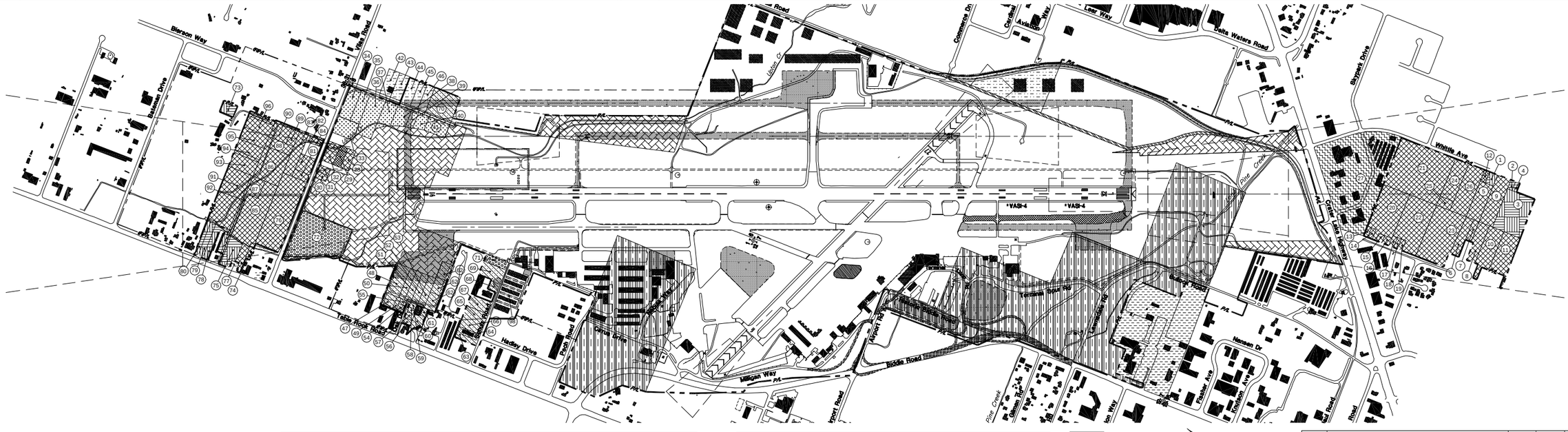
PARCEL	OWNER(S)	ACRES	DATE	BOOK-PAGE	PROJECT
1	Dennison	0.19	4-9-79	78-08706	6-41-0037-06
2	Stalker	0.16	6-26-78	78-14207	6-41-0037-06
3	Whittle	4.45	1-25-79	79-01808	6-41-0037-06
4	Whittle	0.17	1-25-79	79-01808	6-41-0037-06
5	St. Mary's	2.12	6-26-78	78-14206	6-41-0037-04
6	Whittle	1.28	1-26-79	79-01805	6-41-0037-04
7	Schmerber	2.80	4-25-77	77-07971	6-41-0037-04
8	Schmerber	1.38	4-25-77	77-07971	6-41-0037-04
9	Whittle	2.52	1-26-79	79-01807	6-41-0037-04
10	Hostetter	2.04	1-26-79	79-01806	6-41-0037-04
11	Hostetter	1.97	1-26-79	79-01806	6-41-0037-04
12	Imhausen	0.21	4-3-78	78-07188	6-41-0037-05
13	Higday	0.17	2-22-78	78-04015	6-41-0037-05
14	Rice	0.17	4-3-78	78-07187	6-41-0037-05
15	Thompson	0.18	4-19-78	78-08705	6-41-0037-05
16	Peterson	0.18	4-19-78	78-08707	6-41-0037-05
17	Coriell	0.15	2-22-78	78-04016	6-41-0037-05
18	Duncan	0.14	4-3-78	78-07186	6-41-0037-05
19	Smith	0.14	4-3-78	78-07185	6-41-0037-05
20	Milnes	4.35	6-29-78	78-14583	6-41-0037-06

PARCEL	OWNER(S)	ACRES	DATE	BOOK-PAGE	PROJECT
21	Miller/Rasmussen	9.92	6-29-77	78-08706	6-41-0037-06
22	Crippen/Griffen	4.57	12-27-78	78-14207	6-41-0037-06
23	1st Church-Nazarene	5.00	9-15-77	79-01808	6-41-0037-06
24	Rasmussen	2.02	3-9-77	79-01808	6-41-0037-06
25	Hull	0.48	5-10-77	78-14206	6-41-0037-06
26	McIntyre	2.50	1-25-79	79-01805	6-41-0037-06
27	D.A.P. Partnership	Easement	3-27-80	77-07971	-
28	Palen	0.54	1-25-77	77-07971	6-41-0037-04
29	Possinger	0.54	3-21-77	79-01807	6-41-0037-05
30	Collins	0.27	6-29-78	79-01806	6-41-0037-04
31	Collins	0.27	6-29-78	79-01806	6-41-0037-04
32	Bonar	0.56	8-5-77	78-07188	6-41-0037-04
33	Alcorn	0.38	3-21-78	78-04015	6-41-0037-04
34	Girard, S.	2.94	7-15-87	78-07187	3-41-0037-07
35	Emerine, D.	0.85	5-14-87	78-08705	3-41-0037-07
36	Cole, D.	1.76	8-6-87	78-08707	3-41-0037-07
37	Thomas, D.	0.92	3-25-87	78-04016	3-41-0037-07
38	Hendon, T.	0.77	3-16-87	78-07186	3-41-0037-07
39	Sortland, A.	0.41	3-19-87	78-07185	3-41-0037-07
40	Jones, A.	0.51	2-19-87	78-14583	3-41-0037-07

PARCEL	OWNER(S)	ACRES	DATE	BOOK - PAGE	PROJECT
41	Collins, R.	1.11	8-5-87	87-18540	3-41-0037-07
42	Sold - 1992	1.90	6-3-87	87-11135	3-41-0037-03
43	Sold - 1992	1.90	6-3-87	87-11135	3-41-0037-03
44	Stallworth	0.85	6-3-87	87-11135	3-41-0037-03
45	Baxted	0.70	5-21-87	87-10253	3-41-0037-03
46	Hale	0.70	8-11-87	87-16533	3-41-0037-09
47	Vanderpool	0.49	1-8-88	88-00433	3-41-0037-09
48	Jones	1.50	6-2-88	88-10603	3-41-0037-09
49	Mitchell	0.18	4-22-88	88-07538	3-41-0037-09
50	Rayner	0.62	3-29-88	88-05732	3-41-0037-09
51	Sundby	0.67	11-15-88	88-24527	3-41-0037-09
52	Bailey	0.75	6-2-88	88-10600	3-41-0037-09
53	Mooneyham	0.75	6-28-88	88-12575	3-41-0037-09
54	Jarman	0.18	4-29-88	88-08007	3-41-0037-09
55	Zuppe	0.14	6-2-88	88-10598	3-41-0037-09
56	Hislip	0.13	5-20-88	88-09639	3-41-0037-09
57	Johnson	0.19	10-14-88	88-21865	3-41-0037-09
58	Blank	0.13	1-11-89	89-04160	3-41-0037-09
59	Spitz	0.16	7-25-88	88-14689	3-41-0037-09
60	Brown	0.52	11-21-88	88-24971	3-41-0037-09

PARCEL	OWNER(S)	ACRES	DATE	BOOK-PAGE	PROJECT
61	Whipple	0.17	12-18-89	89-29694	3-41-0037-09
62	Buchanan	0.71	6-20-88	88-11902	3-41-0037-09
63	Stubbs	0.65	8-26-88	88-17582	3-41-0037-09
64	Gregory	0.34	9-23-88	88-20115	3-41-0037-09
65	Schwab	0.75	6-20-88	88-11900	3-41-0037-09
66	Hopkins	0.90	2-1-90	90-02537	3-41-0037-09
67	Hartley	0.80	6-20-88	88-11899	3-41-0037-09
68	J.T. Properties	0.80	11-4-88	88-23806	3-41-0037-09
69	Washburn	0.58	10-14-88	88-21866	3-41-0037-09
70	La Salle	2.62	3-27-89	89-06060	3-41-0037-09
71	Twirlers Hall	0.98	6-29-90	90-16354	3-41-0037-11
72	Auction Yard	7.37	6-26-90	90-15935	3-41-0037-09
73	Roberts	0.56	5-7-79	79-09178	6-41-0037-06
74	Hutchin	0.20	6-26-78	78-14208	6-41-0037-04
75	Turner	1.49	6-28-78	78-14461	6-41-0037-06
76	Poythress	6.41	2-1-77	77-05639	6-41-0037-04
77	NOT USED				
78	Boon	0.58	6-26-78	78-14210	6-41-0037-06
79	Crawford	0.65	6-26-78	78-14205	6-41-0037-06
80	Mitchell/Scofield	0.65	6-26-78	78-14211	6-41-0037-06

PARCEL	OWNER(S)	ACRES	DATE	BOOK-PAGE	PROJECT
81	Olsen	0.41	4-20-77	77-07662	6-41-0037-04
82	Johnson	0.96	6-29-77	77-13228	6-41-0037-04
83	Brownlee	1.40	1-19-77	77-01243	6-41-0037-04
84	Bennett	0.43	6-28-78	78-14462	6-41-0037-04
85	McQuade	5.49	6-16-77	77-12152	6-41-0037-04
86	Goff/Bourgeois	3.00	6-7-77	77-11343	6-41-0037-04
87	Bourgeois	0.82	7-6-77	77-13569	6-41-0037-04
88	Sanders	1.11	4-18-77	77-07457	6-41-0037-04
89	O'Conner	0.49	3-30-77	77-06102	6-41-0037-04
90	Sanders	0.80	4-18-77	77-07457	6-41-0037-04
91	Hanson	5.05	7-6-77	77-13567	6-41-0037-04
92	Hanson	Easement	7-6-77	77-13567	6-41-0037-04
93	Hall	1.57	6-16-77	77-12153	6-41-0037-04
94	Meglasson	1.17	4-29-77	77-08380	6-41-0037-04
95	Plummer	1.18	1-21-77	77-01470	6-41-0037-04
96	Anderson	1.14	3-21-78	78-06181	6-41-0037-04
97	Jackson Co.	-	12-31-70	70-12686	-
98	Bear Creek Corp	3.83	7-22-99	99-38714	-



LEGEND

EXISTING	FUTURE	ITEM
PL	(F)PL	Airport Property Line
x x x	xx xx xx	Security Fence
BRL	(F)BRL	Building Restriction Line (BRL)
OFA	(F)OFA	Object Free Area
RSA	(F)RSA	Runway Safety Area
		Guidance Sign or Distance-To-Go Sign
		Airfield Pavement
		Airfield Pavement To Be Removed
		Buildings
		Windcone
		Airport Reference Point (ARP)
1300		Ground Contours (10 ft.)
		Surface Drainage
		Rotating Beacon (El. 1355)

PROPERTY ACQUISITION

PROJECT NUMBER	HATCH	PROJECT NUMBER	HATCH
Avigation Easement		AIP 3-41-0037-07	
ADAP 6-41-0037-04		AIP 3-41-0037-03	
ADAP 6-41-0037-05		Acquisition 85-19779	
ADAP 6-41-0037-06		Release 85-19778	
FAAP 9-35-032-12		AIP 3-41-0037-09	
Surplus Property Act of 1944		AIP 3-41-0037-11	
Property Released		(1)	Parcel Number

NOTES CONCERNING THE AIRPORT PROPERTY MAP

1. The depicted Airport Layout Plan is based on current aerial photography. Before any engineering design or construction projects are undertaken, the exact location of existing facilities should be field-checked. This exhibit is solely intended as part of the Medford Master Plan Update.
2. The information depicted on this Airport Property Map was derived from the Airport's current Exhibit "A". For any additional or more detailed information please consult the Medford-Jackson County Airport Exhibit "A" plan set.

4 Acres

True North
Magnetic North
Var. 17° E (2000)

600' 0 600' 1,200'
GRAPHIC SCALE

No.	Revisions	Date	By	App'd

Drawn: GPG Checked: SCW Date: JANUARY 2001

APPROVAL

Rogue Valley International - Medford Date

FAA, Manager, Seattle Airports District Office Date

Approval Letter dated _____

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AIRPORT PROPERTY MAP

ROGUE VALLEY INTERNATIONAL - MEDFORD
2000 AIRPORT MASTER PLAN UPDATE

DEN INC.

JACKSON COUNTY AIRPORTS

SHEET 11 of 11

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Appendix A
GLOSSARY

Included in the following pages are a number of terms with appropriate definitions to assist the reader in understanding the technical language included in this document.

Air carrier: an operator which: (1) performs at least five round trips per week between two or more points and publish 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.

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

Air traffic control tower (ATCT): a central operations facility in the terminal air traffic control system, consisting of a tower, including an associated 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.

Approach light system (ALS): an airport lighting facility which provides visual guidance to landing aircraft by radiating light beams in a directional pattern by which the pilot aligns the aircraft with the extended centerline of the runway on his final approach for landing.

Azimuth: horizontal direction or bearing; usually measured from the reference point of 0 degrees clockwise through 360 degrees.

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.

Compass locator (LOM): a low power, low or medium frequency radio beacon installed in conjunction with the instrument landing system. When LOM is used, the locator is at the Outer Marker; when LMM is used, the locator is at the Middle Marker.

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: day-night noise level. The daily average noise metric in which that noise occurring between 10:00 p.m. and 7:00 a.m. is penalized by 10 times.

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.

Duration: length of time, in seconds, a noise event such as an aircraft flyover is experienced. (May refer to the length of time a noise event exceeds a specified threshold level.)

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

Fixed base operator (FBO): a provider of service to users of an airport. Such services include, but are not limited to, fueling, hangaring, flight training, repair and maintenance.

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.

Glide slope equipment: electrical equipment that emits signals which provide vertical guidance by reference to airborne instruments during instrument approaches (such as an ILS) or visual ground aids (such as VASI) which provide vertical guidance for a VFR approach, or for the visual portion of an instrument approach and landing.

Global positioning system (GPS): a navigational technology based on a constellation of satellites orbiting approximately 11,000 miles above the surface of the earth.

Ground effect: the excess attenuation attributed to absorption or reflection of noise by man-made or natural features on the ground surface.

Instrument approach procedure (IAP): 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. It is prescribed and approved for a specific airport by competent authority.

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: localizer, glide slope, outer marker, middle marker, and approach lights.

Localizer (LOC): the component of an ILS which provides horizontal guidance to the runway centerline for aircraft during approach and landing by radiating a directional pattern of radio waves modulated by two signals which, when received with equal intensity, are displayed by compatible airborne equipment as an "on-course" indication, and when received in unequal intensity are displayed as an "off-course" indication.

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.

Microwave landing system (MLS): a precision instrument approach system that provides precision guidance in azimuth, elevation, and distance measurement.

Missed approach: a maneuver conducted by a pilot when an instrument approach can not be completed to a landing. This may be due to visual contact not established at authorized minimums or instructions from air traffic control, or other reasons.

Non-directional beacon (NDB): a radio beacon transmitting non-directional signals that a pilot of an aircraft equipped with direction finding equipment can determine his/her bearing to or from the radio beacon and "home" on or track to or from 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, GPS, RNAV, ASR, LDA, SDF, TACAN, NDB, or LOC.

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 threshold on the extended centerline of the runway, indicating to the pilot, that he/she is passing over the facility and can begin final approach.

Precision approach path indicator (PAPI): an airport lighting facility in the terminal area navigation system used primarily under VFR conditions. The PAPI provides visual decent guidance to aircraft on approach to landing through a single row of two to four lights, radiating a high intensity red or white beam to indicate whether the pilot is above or below the required approach path to the runway. The PAPI has an effective visual range of 5 miles during the day and 20 miles at night.

Precision approach procedure: a standard instrument approach procedure in which an electronic glide slope is provided, such as ILS or MLS.

Precision instrument runway: a runway having a existing instrument landing system (ILS).

Reliever airport: an airport to serve general aviation aircraft which might otherwise use a congested air-carrier served airport.

Runway end identification lights (REIL): an airport lighting facility in the terminal area navigational system consisting of one flashing white high intensity light installed at each approach end corner of a runway and directed toward the approach zone, which enables the pilot to identify the threshold of a usable runway.

Vector: a heading issued to an aircraft to provide navigational guidance by radar.

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 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 in the terminal area navigation system used primarily under VFR conditions. It provides vertical visual guidance to aircraft during approach and landing, by radiating a pattern of high intensity red and white focused light beams which indicate to the pilot that he/she is above, on, or below the glide path.

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/Very high frequency omnidirectional range station: 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.

VORTAC/VHF Omnidirectional range/tactical air navigation: a navigation aid providing VOR azimuth, TACAN azimuth, and TACAN distance-measuring equipment (DME) at one site.

ABBREVIATIONS

AGL: above ground level

ALSF: approach lighting system (with sequenced flashing lights)

ARTCC: air route traffic control center

ATCT: air traffic control tower

DME: distance measuring equipment

DNL: day-night noise level

DW: runway weight bearing capacity for aircraft with dual-wheel type landing gear

DTW: runway weight bearing capacity for aircraft with dual-tandem type landing gear

FAA: Federal Aviation Administration

FAR: Federal Aviation Regulation

FBO: fixed base operator

GPS: global positioning system

GS: glide slope

IFR: instrument flight rules (FAR Part 91)

ILS: instrument landing system

LAAS: local area augmentation system

LMM: compass locator at middle marker

LOC: ILS localizer

LOM: compass locator at outer marker

MALSR: medium intensity approach lights with runway alignment indicator lights

MLS: microwave landing system

MM: middle marker

MSL: mean sea level

NAVAID: navigational aid

NDB: non-directional beacon

OM: outer marker

PAPI: precision approach path indicator

REIL: runway end identification lights

SEL: sound exposure level

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

TACAN: tactical air navigation

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 omnidirectional range

VORTAC: (see VOR and TACAN)

WAAS: wide area augmentation system

EXECUTIVE SUMMARY

This report presents the results of a study of the economic benefits of Rogue Valley International - Medford Airport on the airport service area during 1999.

The airport service area includes Jackson, Josephine, Curry and Douglas Counties in Southern Oregon and a portion of Siskiyou County in California.

The Rogue Valley International - Medford Airport is located in Medford in Jackson County, approximately mid-way between Ashland to the South and Grants Pass to the North.

The airport is the third largest commercial service airport in Oregon. Commercial jet air service includes daily non-stop flights to Portland, Seattle, San Francisco and Los Angeles.

Annual passenger enplanements have increased from 150,000 in the mid 1990s to exceed 220,000 in 1999. The airport also provides general aviation services for both recreational and business flyers. There were 150 based aircraft at the airport during 1999.

The objective of this study was to analyze economic activity related to Rogue Valley International - Medford Airport and quantify the economic benefits associated with the presence of the airport.

MEASURING ECONOMIC BENEFITS

Airports bring benefits to the regional economy in many ways. As a transportation center, an airport facilitates commerce through the movements of air travelers and cargo with shorter time to destination than other modes of transport.

Airports bring essential services to a community, including enhanced medical care (such as air ambulance service), support for law enforcement and fire control, and courier delivery of mail and high value parcels. These services raise the quality of life for residents and maintain a competitive environment for economic development.

Although qualitative advantages created by the presence of an airport are significant and widely acknowledged, they are also difficult to measure. In studying airport benefits, regional analysts have emphasized indicators of economic activity for airports that can be quantified, such as dollar value of production of output, number of jobs created, and earnings of workers.

The Rogue Valley International - Medford Airport is a source of economic output (the production of aviation services) which creates employment and earnings for workers on the airport. In addition, visitors who arrive by air at the airport create demand for goods and services off the airport, such as lodging and retailing. Air visitors generally have greater expenditures as compared to visitors using other modes of travel. This spending produces revenues for firms in the hospitality sector as well as employment and earnings for workers **Output** in dollars can be evaluated from either

side of the producer/consumer transaction. From the perspective of the supplier of goods and services, the dollar value of output is equal to the revenues received by that producer. From the viewpoint of the consumer, the dollar value of the goods and services of output is equal to the amount that the consumer spent to purchase that output.

In addition to the private businesses there are also administrative agencies that make expenditures in the economy as they produce services for the community. In any given year, expenditures for agencies are determined by the agency budget. Usual practice is to define the budgets of agencies as an indicator of the dollar value of their production or output.

The sales of on-airport firms and the budgets of on-airport administrative agencies were utilized to measure the value of output on the airport for 1999. The value of output produced off-airport by suppliers of goods and services to air visitors was measured by spending as reported on visitor surveys. These output indicators were combined and labeled as **Revenues** in this study.

Employment is a measure of the number of jobs supported by the revenues created by the presence of Rogue Valley International - Medford Airport. Employment in private firms and administrative agencies was tallied to determine the number of jobs due to the presence of the airport.

Earnings represent the dollar value of payments received by workers (as wages) and business proprietors (as income) who create the goods and services that produce revenues.

DATA COLLECTION

Information on revenues, employment and earnings was collected directly from suppliers and users of aviation services to measure economic activity created by the presence of the airport. Sources of information included interviews and surveys of on-airport employers including private sector firms and government agencies, the Jackson County Airport Authority, airline passengers, and general aviation flyers who used the airport during the 1999 period. Survey forms are shown in an appendix to this report.

Airport Benefit Surveys

- Airport Tenants/Employers
- General Aviation Visitors
- Airline Visitors

Airlines, businesses in the terminal, airport tenants, and government agencies on the airport received a survey form designed for airport employers. Items requested included annual average employees, payroll, operating expenditures, and revenues.

The initial mail survey was followed by telephone or personal contact until all on-airport employers had responded. Therefore, the responses of on-airport employers should be regarded as complete as of mid-year 1999.

General Aviation Visitor Surveys were mailed to owners of aircraft that had visited the area during the past year. The FBO line operations staff maintain excellent records on visiting aircraft and were able to provide addresses of

several hundred registered aircraft owners from fuel slips and tie down logs.

Commercial airline passengers who were visitors to the area were surveyed in the airport terminal in 1999 to determine purpose of visit, length of stay, and expenditures while in the Rogue Valley region.

SOURCES OF ECONOMIC BENEFITS

Economic benefits (output, employment and earnings) are created when economic activity takes place both on and off the airport. The three sources of economic benefits are (1) on-airport benefits, (2) air visitor benefits and (3) indirect (or multiplier) benefits. The economic benefits of Rogue Valley International - Medford Airport by source and location are shown in Table 1.

On-Airport Benefits

There were twenty-nine employers located on Rogue Valley International - Medford Airport in 1999, including airlines, air cargo, FBO services, aviation businesses, flight training, food services, auto rental, air traffic control tower, the airport authority, and various government agencies.

Including the revenues and employment created by outlays for airport capital projects, these economic units reported on-airport benefits of:

- **$37.8 Million Revenues**
- **$13.4 Million Earnings**
- **535 On-Airport Jobs**

Air Visitor Benefits

An additional source of aviation-related spending comes from visitors to the area that arrive at Rogue Valley International - Medford Airport. When air travelers make off-airport expenditures these outlays create revenues (sales) for firms that supply goods and services to visitors.

During 1999, there were 105,063 visitors arriving by commercial air carriers. These travelers spent a total of $32.1 million in the service area during their stay.

There were 10,305 transient (visiting) general aviation aircraft and 22,671 general aviation air travelers that arrived at Rogue Valley International - Medford Airport. Expenditures by general aviation visitors summed to $1.8 million for the year.

Airline and GA visitors traveling for business or personal reasons spent for lodging, food and drink, entertainment, retail goods and services, and ground transportation including auto rental and taxis, creating airport service area revenues, employment and earnings of:

- **$33.9 Million Revenues**
- **$11.0 Million Earnings**
- **1,045 Off-Airport Jobs**

Direct Benefits

The direct benefits represent the sum of on-airport and off-airport (visitor) revenues, earnings and employment due to the presence of the airport and its aviation activity.

Direct benefits are the “first round” impacts and do not include any multiplier effects of secondary spending. The direct benefits of on-airport and off-airport economic activity related to Rogue Valley International - Medford Airport in 1999 were:

- **$71.7 Million Revenues**
- **$24.4 Million Earnings**
- **1,580 Jobs**

The airport presence created benefits to workers by providing income and earnings within the region in 1999 of $24,403,089 representing the payment for the labor component of the economic activity due to the presence of the airport.

There were 1,580 jobs created directly by suppliers and users of aviation services. Two out of every three jobs directly associated with the presence of the airport were in sectors such as lodging and retail which serve air visitors.

Indirect Benefits (Multiplier Effects)

Indirect benefits are created when the initial spending by airport employers or visitors circulates and recycles through the economy. These indirect benefits are often referred to as “multiplier effects.”

In contrast to initial or direct benefits, the indirect benefits measure the magnitude of successive rounds of respending as dollars are spent by those who work for or sell products to airport employers or the hospitality sector.

For example, when an aircraft mechanic's wages are spent to purchase food, housing, clothing, and medical services, these dollars create more jobs and income in the general economy of the region through multiplier effects of respending.

Multiplier impacts were computed using coefficients reported in the statewide airport economic impact study prepared for the Oregon Department of Transportation Aeronautics Section (see *Economic Impact of Airports*, Technical Report, The Airport Technology and Planning Group, Inc, December 1996).

The initial direct revenue stream in the service area of $71.7 million created by the presence of Rogue Valley International - Medford Airport stimulated indirect benefits from multiplier effects within the airport service area of:

- **$78.4 Million Revenues**
- **$21.0 Million Earnings**
- **1,496 Jobs**

Total Benefits

The total benefits of the airport are the sum of the direct benefits and the indirect benefits which result as dollars recirculate in the regional economy. The total benefits of Rogue Valley International - Medford Airport in 1999 were calculated to be:

- **$150.1 Million Revenues**
- **$45.4 Million Earnings**
- **3,076 Total Employment**

TABLE 1
Summary of Economic Benefits: 1999
Rogue Valley International - Medford Airport

	BENEFIT MEASURES		
	Revenues	**Earnings**	**Employment**
On-Airport Benefits Airlines Airport Businesses FBO Services Tower Airport Authority Capital Projects	**$37,825,133**	**$13,401,718**	**535**
Air Visitor Benefits Lodging Food/Drink Retail Goods/Services Entertainment	**33,911,076**	**11,001,371**	**1,045**
Direct Benefits: Sum of On Airport & Air Visitor Benefits	**71,736,209**	**24,403,089**	**1,580**
Indirect Benefits	**78,371,839**	**21,003,599**	**1,496**
TOTAL BENEFITS	**$150,108,048**	**$45,406,688**	**3,076**

ON-AIRPORT BENEFITS

This section provides more detail on the economic benefits associated with activity on site at Rogue Valley International - Medford Airport.

Table 2 illustrates the data on revenues, employment and earnings obtained from mail surveys and interviews conducted with airport tenants during 1999. Values shown for revenues (sales), employment and earnings do not include multiplier effects of indirect benefits.

Copies of the surveys used to compile these figures are included in this report as an appendix. To encourage employers to release confidential figures on employment, earnings and revenues, those responding to the surveys were told that the figures would be used only as aggregate totals for each category. Therefore, details on employment by individual respondents are not presented in Table 2.

Airport Employers

There were 22 private sector employers on the airport during the 1999 study period. Employers included both suppliers and users of aviation products and services.

Commercial air carriers at the airport include Horizon, United and United Express. Airline personnel handle ticket sales and supervise passenger boarding and deplanement. Air carriers employ some 50 persons in full and part time categories.

The value of ticket sales on the airport was estimated at $36 million in 1999. This calculation was based on Department of Transportation data showing 54 percent of passenger enplanements originate in Medford and an average ticket price of approximately $300. (These revenues accrue to the airlines in their corporate or regional headquarters and only a portion remains in the service area as operations outlays and payments to employees.)

In addition to airline employees, there are more than 120 other private sector jobs in the airport terminal building for workers in auto rental firms and at the restaurant and gift shop.

Air cargo employment exceeds 50 workers. On-airport firms include Federal Express, United Parcel Service, Airborne Express, and Medford Air Cargo. Other air cargo firms have employees and trucks with gate access for pick up and delivery.

Fixed base operators offer a full range of general aviation support services and provide employment for more than 75 persons. Operators include Jet Center MFR, Pacific Flights, Medford Air Service and Logan & Reavis Aviation. Other on-site firms such as Erickson Air Crane and Mercy Flights are also important private sector employers.

Total private sector employment on the airport was 412 persons with earnings of $8.4 million. Private sector revenues (not including airline ticket sales) were $27.7 million in 1999.

There were 7 government agencies on the airport in 1999, including the FAA tower staff and Jackson County Airport Authority, other FAA, INS, Weather Service, US Customs, and

TABLE 2
On-Airport Benefits: Revenues, Earnings and Employment
Rogue Valley International - Medford Airport

	BENEFIT MEASURES		
	Revenues	**Earnings**	**Employment**
Sources of On-Airport Benefits **Airlines, Air Cargo** **FBO Services** **Automobile Rental** **Businesses on Airport** **Pilot Training & Supplies** **Air Traffic Control Tower** **Air Rescue and Fire Fighting** **Weather Service, INS, FAA** **Jackson County Airport Authority**	**$33,620,133**	**$12,079,690**	**499**
Capital Projects	**4,205,000**	**1,322,028**	**36**
ON-AIRPORT BENEFITS	**$37,825,133**	**$13,401,718**	**535**

Source: Survey of airport employers, 1999

the Forest Service tanker base. Total government employment was 87 workers.

Capital Projects

Capital projects are vital for airports to maintain safety and provide for growth. Capital spending also creates jobs and injects dollars into the local economy. Capital improvements for 1999 were $4.2 million, creating 36 construction related jobs with earnings of $1.3 million for the year.

Summary of On-Airport Benefits

On-airport activity at Rogue Valley International - Medford Airport created $37.8 million in revenue flows, including capital improvement spending. These revenue flows supported employment of 535 workers on the airport, with earnings of $13.4 million paid to workers and proprietors. The private sector accounted for 4 out of 5 airport jobs in 1999.

AIR VISITOR BENEFITS

Rogue Valley International - Medford Airport attracts visitors from throughout the Western region and the nation who come to the area for recreational, business and personal travel. This section provides detail on economic benefits from air travelers who used the airport in 1999. Values shown for spending (revenues), employment and earnings do not include multiplier effects of indirect benefits unless specifically noted.

Airline Visitors

In 1999, there were 228,398 airline enplanements at Rogue Valley International - Medford Airport. According to an analysis of the air traveler origin and destination data bank of the U. S. Department of Transportation, 46 percent or 105,063 were visitors to the area (Table 3).

The top five origination cities for travel to the Rogue Valley International - Medford Airport were San Francisco, Portland, Los Angeles, Seattle and San Diego.

During the summer of 1999, a questionnaire was administered in the airport terminal to gather information on purpose of travel, length of stay, destination, and expenditures by category of spending for airline visitors. Of the 1,000 surveys administered, 853 were returned with complete information for inclusion in this report.

The average spending per trip reported by all airline visitors in all travel categories (business, personal and tourism) was $343 (figures are rounded to simplify tables). Multiplication of $343 by air visitors yields total airline visitor spending of $36,036,609 for 1990. (Note: this figure includes $3.9 million of "on-airport" spending at on-site rental car outlets.)

TABLE 3
Airline Visitor Travel Patterns
Rogue Valley International - Medford Airport

Enplanements	**228,398**
Percent Visitors	**46%**
Number of Visitors	**105,063**
Avg. Spending per Trip	**$343**
Total Airline Visitor Spending	**$36,036,609**

Source: Airline Visitor Survey 1999

Detail on travel patterns by purpose of travel is shown in Table 4. The survey results revealed that 48 percent of air visitors at the Rogue Valley International - Medford Airport were those whose main purpose was personal travel, primarily visiting friends or relatives. Another 28 percent were traveling for business purposes. The smallest category was the 24 percent of visitors who described themselves as tourists to the region.

The average length of stay for all airline travelers was 5.8 nights. Business travelers recorded the shortest stay (3.5 nights) and those visiting for personal reasons had the longest stay (8.1 nights). Tourists stayed an average of 5.0 nights.

Airline travelers contributed to 621,761 visitor days for the airport service area during 1999. Two thirds of visitor days were accounted for by personal travelers. Although more than one quarter of visitors to the service area were business travelers, those

TABLE 4
Airline Visitor Spending Per Person Per Trip
Rogue Valley International - Medford Airport

	Business	Personal	Tourism	Overall
Purpose of Trip (By Person)	**28%**	**48%**	**24%**	**100%**
Purpose of Trip (By Visitor Days)	**14%**	**66%**	**20%**	**100%**
Party Size	**1.3**	**1.6**	**2.2**	**1.6**
Nights Stay	**3.5**	**8.1**	**5.0**	**5.8**
Lodging/Trip/Person	**$216**	**$33**	**$169**	**$105**
Food/Trip/Person	**$119**	**$87**	**$91**	**$92**
Retail/Trip/Person	**$66**	**$76**	**$62**	**$66**
Entertainment/Trip	**$22**	**$34**	**$88**	**$37**
Ground Trans/Trip	**$94**	**$20**	**$33**	**$43**
Total Person/Trip	**$517**	**$250**	**$443**	**$343**
Percent Citing "Medford" as Primary Destination	**68%**	**33%**	**6%**	**36%**

Source: Survey administered in terminal in July 1999; sample size = 853

traveling on business accounted for only 14 percent of visitor days. This is because the typical business traveler stayed in the area a relatively short period of time. (Analysis of the surveys identified 6 percent of travelers who were in the area for less than one day, arriving in the morning, conducting business, and departing late in the day.)

"Medford" was cited as the primary destination for 68 percent of business travelers, but fewer than 10 percent of tourists listed a visit to Medford as their main objective.

On an average day, there were 1,703 airline travelers in the area spending an average of $58 per person per day.

Spending per person per trip varied by purpose of travel. Those traveling on business had larger than average outlays on most categories of spending, reporting lodging of $216, food costs of $119, and ground transportation of $94 Business travelers spent less than the average amount on entertainment ($22).

The "overall" average expenditures for all visitors

shown in Table 4 were computed by weighting the averages for each category of spending by the "purpose of trip" percentages. The overall spending figures may be thought of as the expected spending by any given visitor arriving at Rogue Valley International - Medford Airport.

For example, lodging is the largest spending component overall, at $105, and a typical group of 1,000 visitors will spend $105,000 on lodging during their stay. However, some persons will spend more and some will spend less.

Airline visitors traveling for personal reasons were most likely visiting friends and relatives in the service area. Many of these travelers reported no expenditures for lodging and, occasionally, food. It should be noted that this is somewhat of an understatement of the actual impact of their visit, since the grocery bill of their host was very likely increased during the time of the airline traveler's visit. The average expenditure for lodging for personal travelers was $33.

Tourists reported the largest outlays for entertainment ($88 compared to an average of $37) possibly reflecting the costs of outdoor expeditions or local events such as theater and concerts.

The figures for spending per person per trip in Table 4 can be used to derive the economic value of visitor expenditures from the average airliner arriving at Rogue Valley International - Medford Airport. The average arriving airliner at the airport carries 30 passengers (Table 5). Of these, 46 percent are visitors to the airport service area. The 14 visitors per aircraft will spend on average $343 per person per trip. Total airline visitor spending of $4,802 of gross revenues are injected into the local economy for each arriving airliner.

TABLE 5
Economic Value of Visitor Spending Associated With Average Airliner Rogue Valley International - Medford Airport

Item	Value
Avg. Passengers Per Plane	**30**
Percent Visitor	**46%**
Number of Visitors Per Plane	**14**
Trip Expenditures per Person	**$343**
Value-One Arriving Airliner =	**$4,802**
Value Including Multiplier =	**$11,155**

Source: Derived from airline visitor survey 1999

The first round spending by visitors circulates within the local economy, where a portion will be spent again, yielding a total benefit 2.323 times the initial impact. Thus, the total spending associated with the average arriving aircraft at Rogue Valley International - Medford Airport was $4,802 X 2.323 = $11,155 after accounting for all multiplier effects.

The economic benefits from airline visitors as measured by revenues, earnings and employment are shown in Table 6. Total expenditures by airline travelers in the airport service area were estimated as $36.1 million in 1999. A portion of auto rental and other ground transport spending was undertaken on the airport and is included in the "on-airport" revenue category in Tables 1 and 2. Off-airport spending by airline visitors, after this adjustment, was $32.1 million.

The largest revenues were created by expenditures on lodging by airline passengers, summing to $11.0

Table 6
Economic Benefits from Airline Visitors - Revenues, Earnings and Employment
Rogue Valley International - Medford Airport

Category	Revenues	Earnings	Employment
Lodging	**$ 11,031,615**	**$3,422,934**	**258**
Food/Drink	**9,653,188**	**3,090,623**	**284**
Retail Sales	**6,888,981**	**2,643,757**	**264**
Entertainment	**3,933,559**	**1,169,242**	**176**
Gaming	**614,011**	**125,648**	**11**
TOTAL	**$ 32,121,354**	**$10,452,204**	**993**

Note: Visitor spending based on passenger survey, 1999; Earnings and employment figures were derived from the IMPLAN input-output model used in the statewide airport economic impact study prepared for the Oregon Department of Transportation Aeronautics Section (see *Economic Impact of Airports,* Technical Report, The Airport Technology and Planning Group, Inc, December 1996). Employment is not necessarily full time equivalents; includes full and some part time workers, figures rounded to head counts. On-airport portion of expenditures by visitors on ground transportation allocated to "on-airport" category to reflect location of auto rental agencies and origination of taxi services at the airport terminal building.

million in 1999. Visitor spending in the lodging sector of the airport service area created 258 jobs with earnings for workers of $3.4 million.

The greatest number of jobs associated with airline visitor spending were in food and drink establishments where 284 jobs were created. Airline visitor spending in eating and drinking places was $9.7 million. The earnings to workers were $3.1 million. Airline visitors spent $6.9 million in retail establishments in 1999. These outlays created 264 jobs with earnings of $2.6 million.

Ground transport spending by visitors off the airport was $614,011. (The on-airport component was $3.9 million, as reported by on-airport rental car firms, who employed some 50 persons.).

The $32.1 million off airport spending by airline visitors arriving at Rogue Valley International - Medford Airport created a total of 993 direct jobs in the service area, with earnings to workers and proprietors of $10.5 million for 1999.

General Aviation Visitors

There were a total of 10,305 transient general aviation aircraft arrivals at Rogue Valley International - Medford Airport in 1999. A questionnaire was administered to general aviation visitors to gather information on travel patterns including length of stay and expenditures by category of spending.

Some visitors stopped only briefly at the airport, some stayed for most of a day, and some stayed

overnight. Overnight visitors represented 15percent and day visitors made up 85 percent of the transient GA aircraft arriving at the airport (Table 7).

TABLE 7
General Aviation Aircraft
Rogue Valley International - Medford Airport

Item	Annual Value
Transient AC Arrivals	10,305
Percent Overnight AC	15%
Overnight Transient AC	1,575
Percent One Day AC	85%
One Day Transient AC	8,730

Source: GA visitor survey, 1999

Separate analyses were conducted for those travelers who reported an overnight stay and those whose visit was one day or less in duration.

Overnight GA Visitors

The travel patterns underlying the calculation of overnight GA visitor economic benefits are shown in Table 8. There were 1,575 overnight aircraft at Rogue Valley International - Medford Airport during 1999, and the average party size was 2.2 persons, including the aircraft pilot. The average stay for overnight visitors was 2.0 nights. Average spending per aircraft was reported as $563 including all outlays for all travelers on their overnight trip to the area.

TABLE 8
General Aviation Overnight Visitors
Rogue Valley International - Medford Airport

Item	Annual Value
Transient AC Arrivals	10,305
Overnight Transient AC	1,575
Avg. Party Size	2.2
Average Stay (nights)	2.0
Spending per Aircraft	$563
Total Expenditures	$886,725

Source: GA visitor survey, 1999

With an average travel party of 2.2 persons, the 1,575 arriving overnight general aviation aircraft carried a total of 3,465 visitors to the airport service area in 1999.

Detail on spending per overnight aircraft is shown in Table 9. As with airline passengers, the largest category for outlays is lodging at $229 per aircraft. Lodging accounted for 41 percent of each visitor dollar. Food and drink per aircraft was $128 for the 2.2 persons in the party during their stay in the area.

The retail, entertainment and transportation categories tended to have wide variations in reported spending by survey respondents. Retail ranged from zero to more than $1,000 for some travel parties. Others reported spending more than $500 on entertainment, while some spent nothing. The average ground transport spending (auto rental and taxi) per aircraft was $88.

TABLE 9
Spending Per Overnight Aircraft
Rogue Valley International - Medford Airport

Category	Spending	Percent
Lodging	$229	41
Food/Drink	128	23
Retail	74	13
Entertainment	44	8
Transportation	88	15
TOTAL	$563	100

Note: Expenditures per aircraft are for all survey respondents, including those who had no outlays for some of the categories shown.

Source: GA visitor survey, 1999

Day Visitors

According to tie down records maintained by FBO operators and the Jackson County Airport Authority, four out of five transient general aviation visitors to Rogue Valley International - Medford Airport stayed in the service area for one day or less.

In 1999, there were 8,730 aircraft that stopped at the airport for one day while the travel party had their aircraft serviced, pursued a personal activity or conducted business. The average travel party size was 2.2 persons (Table 10). The number of visitor days created by one day aircraft was 19,206.

These visitors spent an amount reported as $103 per travel party per day, or an outlay for 2.2 persons per aircraft of $46 per person on their trip. Total spending in the service area by one day visiting aircraft travel parties was $899,190.

TABLE 10
General Aviation Day Visitors
Rogue Valley International - Medford Airport

Item	Annual Value
Transient AC Arrivals	10,305
One Day Transient AC	8,730
Avg. Party Size	2.2
Average Stay (Days)	1
Number of GA Visitors	19,206
Spending per Aircraft	$103
Total Expenditures	$899,190

Source: GA visitor survey, 1999

The largest expenditure category for one day visiting travel parties was food and drink, which averaged $42 per aircraft for the day (Table 11). Spending for retail was the second largest category, at $26 per aircraft or approximately $12 per person.

Entertainment spending was the smallest spending category, at $13 per aircraft. As compared to overnight visitors, travelers in the area for only one day are not likely to engage in more expensive recreational or entertainment pursuits such as outdoor excursions or evening performances.

TABLE 11
Spending Per Day Visitor Aircraft
Rogue Valley International - Medford Airport

Category	Spending	Percent
Lodging	**0**	
Food/Drink	**42**	**41**
Retail	**26**	**26**
Entertainment	**13**	**13**
Transportation	**22**	**21**
TOTAL	**$103**	**100**

Source: GA visitor survey, 1999

Combined GA Visitor Spending Benefits

Table 12 shows the economic benefits resulting from spending in the region by combined overnight and day general aviation visitors arriving at Rogue Valley International - Medford Airport.

There were 10,305 transient general aviation aircraft that brought visitors to the airport in 1999. Of these, 1,575 were arriving overnight general aviation aircraft and 8,730 were one day visiting aircraft. Each overnight travel party spent a reported average of $563 during their trip to the airport service area and travelers on each day visitor aircraft spent an estimated $103 per trip.

Multiplying the expenditures for each category of spending by the number of aircraft yields the total outlays for lodging, food and drink, entertainment, retail spending and ground transportation due to GA visitors during the year.

General aviation visitor spending on goods and services during 1999 summed to $1.8 million in revenues for service area firms in the lodging, food service, retail, entertainment and ground transportation sectors.

There were 26,136 visitor days attributable to general aviation travelers during the year. Twenty-three percent of visitor days were due to overnight GA travelers and seventy-seven percent were one day visitors.

On an average day, there were 72 visitors in the service area that had arrived via GA aircraft at the airport. Average daily spending by GA air travelers was $4,903 within the average airport service area. The average economic impact of any arriving general aviation transient aircraft (combined overnight and day visitors) was $174.

The largest spending category by general aviation visitors was expenditures for food and drink with outlays of $565,884for the year. Food and drink accounted for nearly one third of GA traveler spending.

Spending for lodging services was the next largest spending category ($360,360), followed closely by retail activity and ground transport. The smallest spending component was in entertainment.

Of total spending of $1.8 million created by GA visitors, an average of 31 cents of each dollar was used within the service area by employers as earnings paid out to workers. Earnings for employees in the local food service and retail industries were largest.

Expenditures by GA visitors created 52 direct jobs in the tourist sector in the service area. Food services and retailing, taken together, created more than one half of the total jobs due to GA traveler spending.

TABLE 12
Economic Benefits from General Aviation Visitors - Revenues, Earnings and Employment
Rogue Valley International - Medford Airport

Category	Spending per AC		Revenues	Earnings	Employment
	Overnight	Day			
Lodging	**$229**		**$360,360**	**$111,814**	**8**
Food/Drink	**128**	**$42**	**565,884**	**181,177**	**17**
Retail Sales	**74**	**26**	**348,282**	**133,659**	**13**
Entertainment	**44**	**13**	**184,536**	**54,852**	**8**
Ground Transport	**88**	**22**	**330,660**	**67,665**	**6**
TOTAL	**$563**	**$103**	**$1,789,722**	**$1,126,873**	**52**

Note: Visitor spending based on general aviation survey, 1999; Earnings and employment figures were derived from the IMPLAN input-output model used in the statewide airport economic impact study prepared for the Oregon Department of Transportation Aeronautics Section (see *Economic Impact of Airports*, Technical Report, The Airport Technology and Planning Group, Inc, December 1996). Employment is not necessarily full time equivalents; includes full and some part time workers, figures rounded to head counts. Some columns may not compute exactly due to rounding.

Combined Airline and GA Visitors

Table 13 presents the economic benefits derived from airline and general aviation visitors combined. Air travelers in the two categories together contributed to an overall combined figure of 647,897 visitors days and total spending of $33.9 million during 1999. Spending in both the lodging and food service industries exceeded $10 million.

The revenue flow in the Rogue Valley International - Medford Airport service area from air visitors directly created 1,045 jobs. Of this total, 300 or 29 percent were involved with providing visitors with food and drink. An additional 277 jobs were in retailing, and 267 were in the lodging industry.
Only 17 jobs were created in ground transport, but this figure is influenced by the allocation of rental car outlays to the on-airport category. Some 50 jobs were created by rental car agencies on the airport.

Earnings to workers serving airline and general aviation visitors to the airport service area in 1999 were $11 million. Earnings in lodging were the largest, followed closely by food services.

On-airport revenue flows were $37.8 million and off-

airport revenues from visitors were $33.9 million.

Note that the difference between the two is influenced by the allocation to "on-airport" of the $3.9 million spent by visitors at auto rental outlets in the terminal building. If the $3.9 million for on-airport rental cars had been allocated to the visitor spending component, the relative magnitude of the two sources would have been reversed.

It is also of interest to note that the off-airport spending by visitors created nearly twice as many jobs as on-airport spending (1,045 compared to 535). However, the on-airport earnings of $13.4 million were 20 percent greater than the $11 million earned by off airport workers in the hospitality sector. This differential is due to the large number of seasonal and part time jobs in the off-airport hospitality sector of the economy of the airport service area.

TABLE 13
Economic Benefits from Airline and GA Visitors - Revenues, Earnings and Employment
Rogue Valley International - Medford Airport

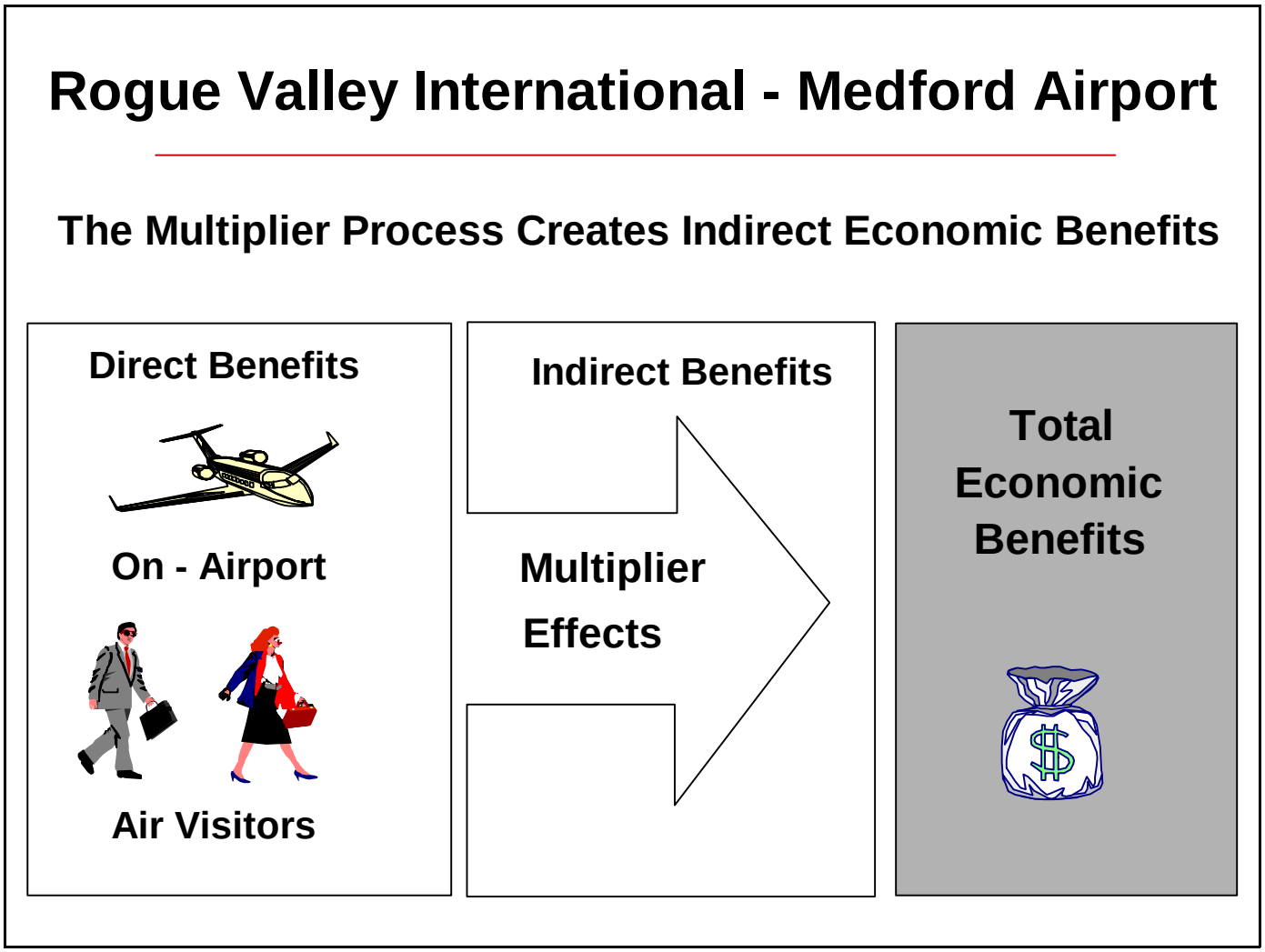
Category	Revenues	Earnings	Employment
Lodging	**$11,391,975**	**$3,534,748**	**267**
Food/Drink	**10,219,072**	**3,271,800**	**300**
Retail Sales	**7,237,263**	**2,777,415**	**277**
Entertainment	**4,118,095**	**1,224,095**	**184**
Ground Transport	**944,671**	**193,313**	**17**
TOTAL	**$33,911,076**	**$ 11,001,371**	**1,045**

Note: Visitor spending based on airline passenger survey and general aviation visitor survey, 1999; Earnings and employment figures were derived from the IMPLAN input-output model used in the statewide airport economic impact study prepared for the Oregon Department of Transportation Aeronautics Section (see *Economic Impact of Airports,* Technical Report, The Airport Technology and Planning Group, Inc, December 1996). Employment is not necessarily full time equivalents; includes full and some part time workers, figures rounded to head counts. On-airport portion of expenditures by airline visitors on ground transportation allocated to "on-airport" category to reflect location of auto rental agencies and origination of taxi services at the airport terminal building.

INDIRECT BENEFITS: MULTIPLIER EFFECTS

The output, employment, and earnings from on-airport activity and visitor spending represent the direct benefits from the presence of Rogue Valley International - Medford Airport. For the service area, these benefits summed to $71.7 million of output (measured as revenues to firms and budgets of administrative units), 1,580 jobs, and earnings to workers and proprietors of $24.4 million. These figures for initial economic activity created by the presence of the airport do not include the "multiplier effects" that result from additional spending induced in the economy to produce the initial goods and services.

Production of output requires inputs in the form of supplies and labor. Purchase of inputs creates additional or indirect revenues, employment and earnings due to the presence of the airport that should be included in total benefits of the airport. Airport benefit studies rely on multiplier factors from input-output models to estimate the impact of successive rounds of spending on output, earnings and employment to determine indirect and total benefits, as illustrated in the figure below.



The multipliers used for this study were based on the IMPLAN model, an input-output model that provides data tables and multiplier coefficients for states and counties in the United States. Application of the same multipliers as used in the Oregon state-wide impact study allows for comparison of results from the current study with other airports in Oregon and also makes it possible to compare economic benefits in 1999 with impacts reported in the 1996 study.

To demonstrate the methodology of the approach, the multipliers from the Oregon study for revenues (output), earnings and employment are shown in Table 14. The multipliers represent weighted multipliers for combined industries in each category developed for the Oregon state-wide report.

The multipliers in this table provide for calculating the indirect and total impacts on all industries of the regional economy resulting from the direct impact of each aviation related industry.

The multipliers for revenues show the average dollar change in revenues for all firms in the service area due to a one dollar increase in revenues either on the airport or through visitor spending.

For example, each dollar of new output (revenue) created by firms in air transportation (airlines, air cargo or FBO operators) circulates through the economy until it has stimulated total output in all industries in the service area of $1.9410.

The revenue multiplier of 1.9410 for air transportation activity shows that for each dollar spent on the airport there is additional spending created of $0.941 or 94.10 cents of indirect or multiplier spending.

Direct revenues from all sources associated with the presence of Rogue Valley International - Medford airport were $71.7 million in 1999. After accounting for the multiplier effect, total revenues created within the service area were $150.1 million. Indirect or secondary revenues were $78.4 million, the difference between total and direct revenues.

The multiplier for earnings shows the dollar change in earnings for the service area economy due to a one dollar increase in earnings either on the airport or in the visitor sector.

The earnings multipliers determine how wages paid to workers on or off the airport stay within the economy and create additional spending and earnings for workers in non-aviation industries. For example, each dollar of wages paid for workers in air transportation stimulates an additional 80.69 cents of earnings in the total economy.

The total earnings benefit of the airport was $45.4 million in 1999, consisting of $24.4 million of direct benefits and $21.0 million of indirect benefits. The economic interpretation is that the presence of the airport provided employment and earnings for workers, who then respent these dollars in the service area. The initial wages of $24.4 million for aviation related workers and proprietors were spent for consumer goods and services that in turn created additional earnings of $21.0 million for workers and proprietors in the general economy.

The multipliers for employment show the total change in jobs for the service area economy due to an increase of one job on or off the airport.

The overall result is that the 1,580 direct jobs created by the presence of the airport supported an additional 1,496 jobs in the service area as indirect employment.

The sum of the direct aviation related jobs and indirect jobs created in the general economy is the total employment of 3,076 that can be attributed to the presence of the airport.

TABLE 14
Multipliers and Indirect Benefits Within the Airport Service Area
Rogue Valley International - Medford Airport

Revenue Source	Direct Revenues	Output Multipliers	Indirect Revenues	Total Revenues
Air Transportation	$15,063,784	1.9410	$11,889,551	$26,953,335
Concessions	12,640,390	2.4600	18,454,969	31,095,359
Government	10,120,959	2.1933	10,822,884	20,493,843
Visitor Benefits	33,911,076	2.3230	37,204,435	71,115,511
Revenues	$71,736,209		$78,371,839	$150,108,048
Earnings Source	**Direct Earnings**	**Earnings Multipliers**	**Indirect Earnings**	**Total Earnings**
Air Transportation	$3,991,328	1.8069	$3,220,603	$7,211,931
Concessions	4,427,000	1.8914	3,946,228	8,373,227
Government	4,983,390	1.6815	3,170,940	8,154,330
Visitor Benefits	11,001,371	1.9695	10,665,828	21,667,200
Earnings	$24,403,089		$21,003,599	$ 45,406,688
Employment Source	**Direct Employment**	**Employment Multipliers**	**Indirect Employment**	**Total Employment**
Air Transportation	187	2.2912	241	428
Concessions	225	1.8985	202	427
Government	123	2.0086	116	238
Visitor Benefits	1,045	1.8967	937	1,983
Employment	1,580		1,496	3,076

Notes: Air transportation includes airlines, air cargo, FBO services; concessions are firms in terminal and other airport businesses; government is agencies plus construction. Source is economic impact study prepared for the Oregon Department of Transportation Aeronautics Section (*Economic Impact of Airports,* Technical Report, The Airport Technology and Planning Group, Inc, December 1996, pg 26).

SUMMARY AND FUTURE IMPACTS

Airports are available to serve the flying public and support the regional economy every day of the year. On a typical day at Rogue Valley International - Medford Airport, there are more than 180 operations by aircraft in use for passenger and cargo transport, business, recreation, and training flights.

During each day of the year in 1999, Rogue Valley International - Medford Airport generated $400,000 of revenues within its service area (see box). Revenues and production support jobs, not only for the suppliers and users of aviation services, but throughout the economy.

Each day Rogue Valley International - Medford Airport provides 535 jobs directly on the airport and in total supports 3,076 local jobs in the airport service area. These workers brought home daily earnings of $124,000 for spending in their communities in 1999.

On an average day during the year, there are 1,775 visitors in the area who arrived at Rogue Valley International - Medford Airport. The average expenditures for these visitors on a typical day are $93,000.

Table 15 shows a summary of economic benefits associated with the airport in 1999. Direct benefits to the service area, without including multiplier effects, include revenues of $71.7 million, 1,580 jobs and earnings to workers and proprietors of $24.4 million.

Rogue Valley International - Medford Airport Daily Economic Benefits

- **$400,000 Revenues**
- **3,076 Local Jobs Supported**
- **$124,000 Income Earned**
- **$93,000 Visitor Spending**
- **1,775 Air Visitors**

Including indirect or multiplier effects, total benefits to the service area are $150.1 million in revenues, 3,076 jobs and earnings of $45.4 million

As aviation activity increases in the airport service area, the economic benefits of the airport to the regional economy may be expected to increase.

The short term planning horizon for the airport is associated with an increase in enplanements to an annual level of 260,000. Assuming commerce on the airport and in the community increases at the same pace, employment on the airport will rise to 580 workers and jobs related to air visitors will increase to 1,214 (Table 16).

Visitor spending will exceed $39 million (measured in 2000 dollars) and the revenue benefits due to the presence of the airport will increase to $164.2 million, with multiplier effects.

The intermediate term planning horizon is based on enplanements of 300,000 with total operations of 79,100 (Table 17). Direct employment from aviation activity will rise to 2,071 and the employment impact after all multiplier effects is 4,031 total jobs. Revenues will rise to $189.5 million in the intermediate term.

The long term is defined as 380,000 enplanements, 69,000 general aviation operations, and 90,900 total operations per year. The long term projections imply on-airport employment of 848 workers with earnings exceeding $20.5 million. Spending by air visitors will be $57.6 million, with employment of 1,776 workers.

Accounting for all multiplier effects, jobs supported in the airport service area under the long term assumptions total 5,107. Revenues will be $240 million, measured in 2000 dollars (see table 18 and the accompanying bar graph).

TABLE 15
Summary of Economic Benefits: 1999
Rogue Valley International - Medford Airport

	Revenues	Earnings	Employment
On-Airport Activity	**$37,825,13**	**$13,401,718**	**535**
Air Visitors	**33,911,076**	**11,001,371**	**1,045**
Direct Benefits	***71,736,209***	***24,403,089***	***1,580***
Indirect Benefits	**78,371,839**	**21,003,599**	**1,496**
Total Benefits	**$150,108,048**	**$45,406,688**	**3,076**

Note: Revenues, earnings and employment for 1999 reflect activity associated with 218,593 enplanements, 51,299 general aviation operations, and 65,943 total operations.

TABLE 16
Summary of Economic Benefits: Short Term
Rogue Valley International - Medford Airport

	Revenues	Earnings	Employment
On-Airport Activity	**$ 39,066,594**	**$14,036,600**	**580**
Air Visitors	**39,404,670**	**12,783,593**	**1,214**
Direct Benefits	***78,471,265***	***26,820,193***	***1,794***
Indirect Benefits	**85,729,890**	**23,083,987**	**1,699**
Total Benefits	**$164,201,155**	**$49,904,180**	**3,493**

Note: Revenues, earnings and employment for short term forecast period reflect activity associated with 260,000 enplanements, 56,000 general aviation operations and 74,120 total operations.

TABLE 17
Summary of Economic Benefits: Intermediate Term
Rogue Valley International - Medford Airport

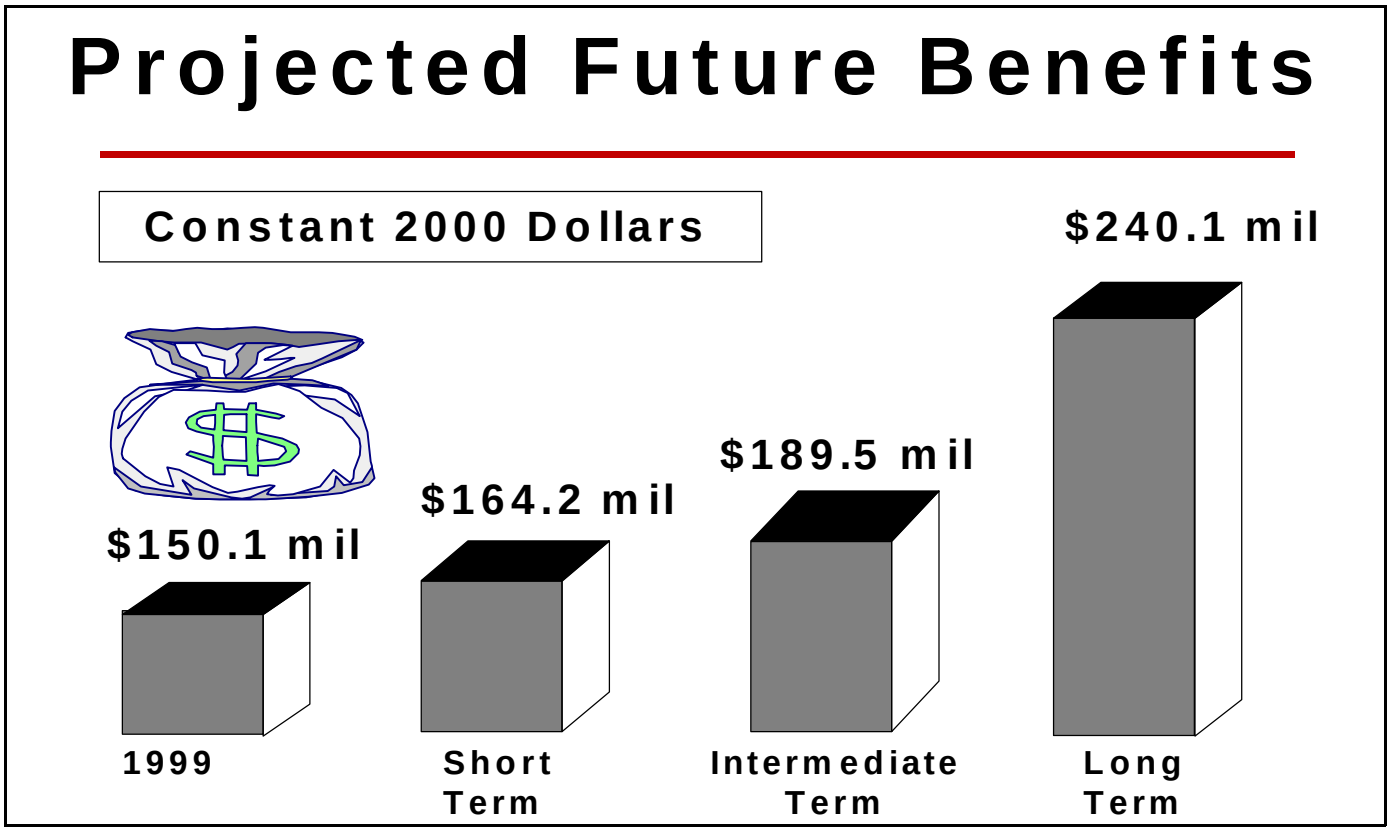
	Revenues	Earnings	Employment
On-Airport Activity	**$ 45,082,850**	**$16,198,236**	**669**
Air Visitors	**45,472,990**	**14,752,266**	**1,402**
Direct Benefits	***90,555,839***	***30,950,502***	***2,071***
Indirect Benefits	**98,932,294**	**26,638,921**	**1,960**
Total Benefits	**$189,488,133**	**$57,589,423**	**4,031**

Note: Revenues, earnings and employment for intermediate term forecast period reflect activity associated with 300,000 enplanements, 60,000 general aviation operations and 79,100 total operations.

TABLE 22
Summary of Economic Benefits: Long Term
Rogue Valley International - Medford Airport

	Revenues	Earnings	Employment
On-Airport Activity	**$57,119,974**	**$20,523,165**	**848**
Air Visitors	**57,614,278**	**18,691,121**	**1,776**
Direct Benefits	***114,734,249***	***39,214,287***	***2,624***
Indirect Benefits	**125,347,215**	**33,751,513**	**2,484**
Total Benefits	**$240,081,464**	**$72,965,799**	**5,107**

Note: Revenues, earnings and employment for long term forecast period reflect activity associated with 380,000 enplanements, 69,000 general aviation operations and 90,900 total operations.



APPENDIX

ROGUE VALLEY INTERNATIONAL - MEDFORD AIRPORT

ECONOMIC BENEFIT STUDY

SURVEY FORMS

ROGUE VALLEY INTERNATIONAL - MEDFORD AIRPORT
ECONOMIC BENEFIT STUDY

To All Airport Employers and Tenants:

An Economic Benefit Study for Rogue Valley International - Medford Airport will be included as part of the Master Plan now being prepared. Your cooperation is requested to compile meaningful economic data about the airport. This survey of employers will be handled with the strictest confidentiality by an independent consultant and only aggregate numbers will be used in publishing the report. If you have questions about the survey, please call Rogue Valley International - Medford Airport (541) 776-7222. Please return the survey form in the postage paid return envelope within ten days.

1. Please describe your main business activity (restaurant, aircraft maintenance, etc.)

Type of business: _____

2. How many employees do you have on the payroll?

Full Time _____

Part Time _____

3. Please estimate your 1999 payroll **$** _____

4. Please estimate your 1999 operating costs (do not include payroll but do include cost of utilities, goods and services) **$** _____

5. Please estimate 1999 total sales for your business

a. EITHER indicate amount if you can release it **$** _____

b. OR mark appropriate range on scale below

_____

0 25 50 75 100 200 400 500 750 1 2 5 10
($ Thousands) ($ Millions)

Thank you for your cooperation!

ROGUE VALLEY INTERNATIONAL - MEDFORD AIRPORT
GENERAL AVIATION VISITOR SURVEY

Dear Aircraft Owner:

Your aircraft appears on our listing of visitors to Rogue Valley International - Medford Airport during the past year. We are asking your assistance in completion of this confidential questionnaire to measure the economic benefits from spending by GA visitors. The information will help us improve services for General Aviation travelers. If you have questions about the survey, please call Rogue Valley International - Medford Airport (541) 776-7222. Please return the survey form in the enclosed envelope within ten days.

1. What was the main purpose of your most recent visit to the Rogue Valley - Medford area?

Fuel stop only _____ Business trip _____ Tourism/sightseeing _____ Personal/family visit _____

2. How many people were in your travel party? Circle : 1 2 3 4 or more (specify) _____

3. Where was your primary destination while in the area? Did not leave airport _____

Medford _____ Southern Oregon Area _____ Other (specify) _____

4. Please describe your aircraft: Single engine piston _____ Multi-engine piston _____

Turboprop _____ Turbojet _____ Other type of aircraft (please describe) _____

5. How many nights did you stay in this area?

Circle: None (day trip) 1 2 3 4 or more (specify) _____ _____

6. Please estimate spending by your ENTIRE TRAVEL PARTY on your visit to the area. Do not include expenditures for aircraft fuel or FBO services. Please circle the figure.

Hotel/Lodging:

None $50 75 100 125 150 200 300 400 500 600 700 800 or more (specify) _____

Restaurant Food and Drink:

None $10 25 50 75 100 125 150 175 200 300 400 500 600 or more (specify) _____

Retail Spending for Goods and Services (include groceries but not entertainment)

None $10 25 50 75 100 125 150 175 200 300 400 500 600 or more (specify) _____

Entertainment (golf, performances, river rides, etc):

None $10 25 50 75 100 125 150 175 200 300 400 500 600 or more (specify) _____

Ground Transportation Including Auto Rental:

None $10 25 50 75 100 125 150 175 200 300 400 500 600 or more (specify) _____

Thank you for your cooperation!

ROGUE VALLEY AIR VISITOR SURVEY

Dear Visitor:
We welcome you to the Rogue Valley area. To help us provide the best service possible for visitors, we are asking your assistance in completion of this anonymous and confidential questionnaire. The information gathered will be used to develop the Rogue Valley International - Medford Airport Master Plan. When filled out, please fold the survey form and return it to a member of the Survey Team or place it in the collection box in the waiting area. Thank you for your cooperation.

1. Where is your residence? City _____ State _____

2. What was the main purpose of your trip to the Rogue Valley area?

a. Tourism/recreation _____ b. Business _____ c. Personal/family/friends _____

3. How many people are in your travel party? Circle : 1 2 3 4 5 or more (specify) _____

4. How many NIGHTS did you stay in the Rogue Valley area on this trip?

Circle: None 1 2 3 4 5 6 7 8 9 10 11 12 13 14 or more (specify) _____

5. Where was your primary destination for this trip?

Medford ___ Other (please list) _____

6. Please estimate spending by your ENTIRE TRAVEL PARTY on each category during your TOTAL STAY in the Rogue Valley area. Circle the closest figure.

Hotel/Lodging:
None $50 100 150 200 300 400 500 600 700 800 900 1000 1500 or more (specify) _____

Restaurant Food and Drink:
None $25 50 75 100 150 200 250 300 400 500 600 700 800 900 or more (specify) _____

Retail Spending for Goods and Services (but not entertainment):
None $25 50 75 100 150 200 250 300 400 500 600 700 800 900 or more (specify) _____

Entertainment (Tours, Events, Shows, Movies, Golf, etc.):
None $25 50 75 100 150 200 250 300 400 500 600 700 800 900 or more (specify) _____

Ground Transportation Including Auto Rental:
None $25 50 75 100 1 50 200 250 300 400 500 600 700 800 or more (specify) _____

JACKSON COUNTY AIRPORT AUTHORITY

MASTER PLAN SUPPLEMENT

ROGUE VALLEY INTERNATIONAL-MEDFORD AIRPORT

Prepared For The
JACKSON COUNTY AIRPORT AUTHORITY

Prepared By
Coffman Associates, Inc.

January 2001

" The preparation of this report (document) was funded at least in part by the Oregon State Lottery through the Jackson-Josephine Region Regional Board for the purpose of promoting economic and community development."

AIR CARGO SHIPPERS AND RESULTS

Approximately 75 surveys were mailed to potential/current users of air shipping facilities at the Rogue Valley International-Medford (RVI) Airport. The questionnaires were designed with a specific audience in mind, and a goal of collecting the pertinent data necessary to market potential from RVI Airport.

The shipper survey's response rate was approximately 20%. While this response level was somewhat disappointing, there were enough responses to base some general conclusions related to cargo use, forecasts, and facility needs.

ORIGINS AND DESTINATIONS

The companies that participated in the survey were asked to list the principal destinations of their outbound shipments and the point of origin for incoming shipments. The top five responses are listed below.

Destinations		**Origins**	
Domestic	***International***	***Domestic***	***International***
Minnesota	Canada	California	Thailand
Colorado	England	Nebraska	India
Alaska	Germany	Colorado	France
California	Switzerland	Florida	Germany
Illinois	Mexico	New York	England

VOLUME

Shippers were asked to estimate the total number of pounds shipped from RVI Airport, both domestically and internationally. The response was 40.25 annual tons to domestic destinations and 36.1 annual tons to international destinations. By extrapolating the response from the 20% of shippers who responded to the survey, we can estimate a total tonnage shipped domestically of 200 tons and 180 tons internationally.

Such a low number does not accurately reflect the potential from the local market. The potential cargo market for RVI Airport reaches as far north as Portland and as far south as San Francisco. When taking this larger market into consideration, the total tonnage of cargo that could be handled through the RVI Airport could be considerably higher.

FACTORS

Shippers were asked to list the most important factors in selecting a method of freight shipment. The responses are listed below.

1. Speed
2. Cost
3. Special Handling
4. Reliability

SERVICES AND FACILITIES

The shippers were asked to rate a set of six separate services and facilities for their importance to the user's shipment of freight and cargo through RVI Airport. The shippers were asked to rate these factors on a scale of 1 to 10, with 10 being the most important. These factors, and their ranking are listed below.

Customs Inspection	7.4
Foreign Trade Zone	5.5
Next Day Delivery	3.4
In-Bond Warehouse	2.2
Agricultural Inspection	1.9
Refrigerated Storage	0.6

REGIONAL CARGO ACTIVITY

As previously mentioned, geographic areas between San Francisco and Portland have been identified as being in RVI Airport's potential cargo market. In addition, cargo activity for Seattle will be included for comparison.

The areas between Portland and San Francisco are most closely positioned to Medford and will most likely be the primary areas from which Medford will need to attract business. The total cargo shipped through these airports in 1999 is shown on the next page:

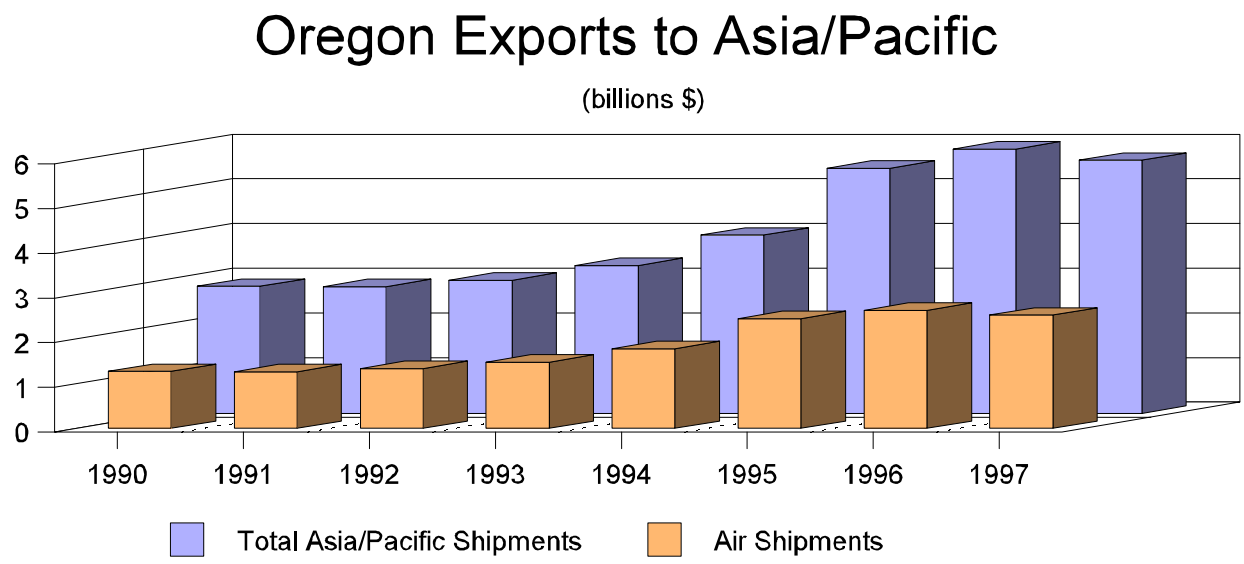
Total Cargo - (metric tons) - 1999			
	San Francisco	Portland	Seattle
TOTAL	842,215	311,545	449,432
Source: Airports Council International North America			

Based upon supplemental information obtained from SFO, international air cargo made up 45 percent of the total cargo moved through the airport in 1999 (no breakdown available for Asia/Pacific market but assumed at 10 percent). For Seattle, 25 percent of the total freight was international and approximately 10 percent of the total cargo was in the Asia/Pacific market. Further breakdown of the Portland total was not available, but it can be assumed that a similar percentage (10 percent) is in the Asia/Pacific market.

If RVI Airport were able to generate just 20% of the combined cargo movement in the Asia/Pacific market, over 32,000 tons of cargo would move through RVI Airport on an annual basis. This would equate to an average day demand of 123 tons (based on 260 working days) or 271,000 pounds. Assuming equivalent movements to/from the area, the daily lift capacity requirement would equate to two daily 747s (on a five-day per week schedule).

OREGON EXPORTS

The following table shows total Oregon exports to the Asia/Pacific region since 1990. In the seven-year period, Oregon has posted a 9.0% annual growth rate to the Asia/Pacific region. Exports have increased from $2.8 billion in 1990 to over $5.6 billion in 1997. Assuming a consistent rate of growth, exports to Asia could exceed $39 billion in 2019.



Source: *Oregon Economic and Community Development Department*

According to the U.S. Department of Commerce 1997 Economic Census, nearly 45% of cargo leaving the United States for destinations other than Canada and Mexico were shipped via air. Using this figure, approximately $2.5 billion worth of goods were exported via air shipping from Oregon to the Asia/Pacific region in 1997.

INDUSTRY OUTLOOK

Air cargo is showing robust growth again after suffering through the Asian financial crisis. In 1999, world air cargo traffic grew by 5.7%. With this growth rate, it appears the world market should continue to show growth over the next few years.

Long term air cargo growth is expected to average between 5.7% and 6.4% per year over the next twenty years. Growth in markets tied to Asia will lead the industry, outpacing world air cargo growth rates. In fact, the Intra-Asian freight market is expected to grow at an annual rate of nearly 8.6%

Cargo flights between North America and Asia can be further broken down to Asia, China, and the Pacific. Growth forecasts for these areas for flights originating in North America, and for flights coming from Asia are listed below.

Freight growth rates for selected sub-markets

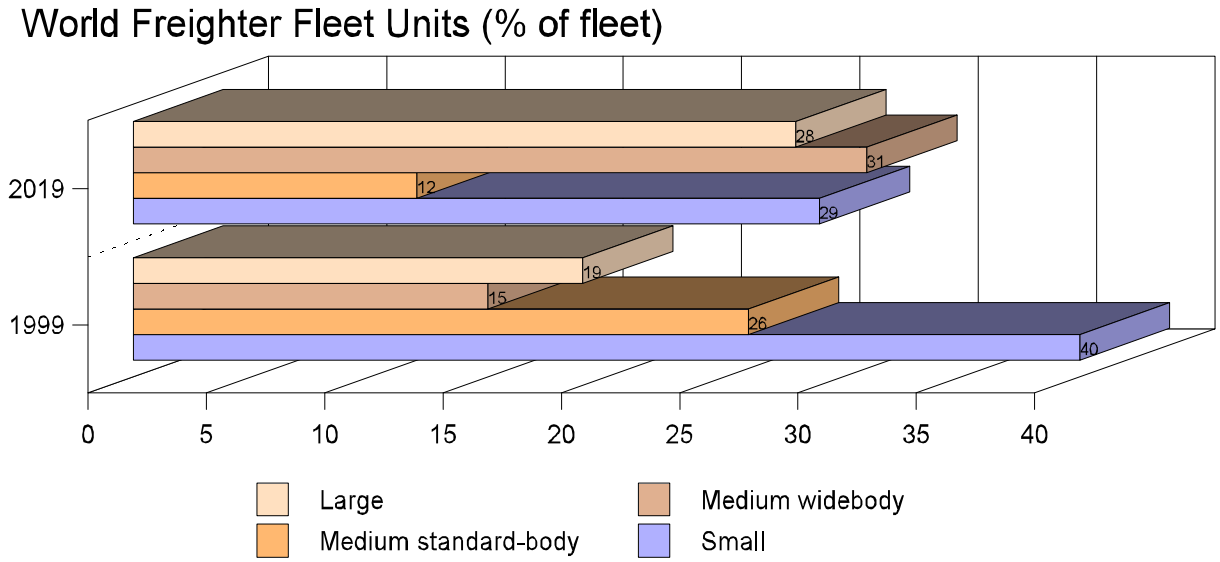
Sub-Market	% of world FTK	Average Annual Growth (%)		
	1999	1999-2009	2009-2019	1999-2019
Asia - N.A.	7.31	7.4	6.1	6.7
China - N.A.	2.94	7.6	6.6	7.1
Pacific - N.A.	.34	4.4	3.7	4.1
N.A. - Asia	5.42	6.4	7.3	6.8
N.A. - China	.97	7.5	5.8	6.6
N.A. - Pacific	.83	4.6	4.0	4.3
Total World		6.1	5.3	5.7

Source: Airbus Market Forecast 2000-2019, cargo forecast results
N.A. - North America
FTK - Freight Tons Kilometers

Although the forecasts listed above are for all flights coming from North America, it is safe to assume that the majority of cargo flights leaving North America for Asia are originating on the west coast due to the long distances involved. It is therefore reasonable to assume that these forecasts should hold true for the RVI Airport potential service area.

WORLD AIR CARGO FLEET

The makeup of the world's freighter fleet is currently dominated by small and medium sized aircraft. Over the next twenty years the world's fleet will undergo a massive change. Much of this change will occur as current passenger aircraft are converted to cargo use at the end of their passenger carrying life-cycle. Boeing is predicting the current fleet of 1,676 freighters will increase to 3,197 by 2019, with the highest growth in the wide-body freighters, such as the Boeing 747 and the Airbus A340 type aircraft. It is estimated that 2,600 aircraft will be added to the world's freighter fleet by 2019. With these additions, the makeup of the worlds freighter fleet will include nearly 60% wide-body aircraft, up from only 34% in 1999.



Source: Boeing World Air Cargo Forecast 2000-2001

Markets linking to the Asia/Pacific region, namely North America and Europe, will generate much of the anticipated demand for these wide-body freighters.

For RVI Airport to take advantage of this growing cargo market to the Asia/Pacific region, two things need to happen: 1) the airfield will need to be upgraded to handle fully loaded wide-body (Boeing 747 and Airbus A340) aircraft for non-stop flights to Asia; and 2) RVI Airport will need to aggressively market their services to attract existing and future business from other regional cargo airports. To handle a fully loaded 747-400 freighter, RVI Airport would need in excess of 10,000 feet in length on the primary runway (the exact length required depends upon payload and temperature).