Bishop Airport

AIRPORT MASTER PLAN

AIRPORT MASTER PLAN

for

BISHOP AIRPORT
COUNTY OF INYO, CALIFORNIA

FINAL TECHNICAL REPORT

Prepared By
COFFMAN ASSOCIATES, INC.
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INTRODUCTION

Introduction and Summary

The Master Plan for Bishop Airport was undertaken by the County of Inyo to outline a long-range, orderly direction for airport development and to provide a safe, efficient, economical, and environmentally acceptable air transportation facility. The study was funded jointly by the Federal Aviation Administration (FAA) and the County of Inyo. Technical work was undertaken by Coffman Associates, Inc., with offices in Kansas City and Phoenix.

In addition to consultant and County staff, several members of the community were identified to serve with federal and state representatives on a Planning Advisory Committee. The committee reviewed working papers and met with the consultant on several occasions to provide valuable input throughout the development of the plan. The final plan presents a well coordinated effort, and reflects the direction provided by this diversified group.

The Master Plan updates a study which completed for the airport in 1978. The aviation industry and the rules governing airports have changed significantly since that study was completed. Therefore, it was necessary to develop new forecasts of long-range aviation demand, examine the facility's compliance with current FAA regulations, and outline a development program which is financially feasible and environmentally compatible with the area. Major elements of the plan were completed over a 12-month period. The final working papers were coordinated with the Planning Advisory Committee in September 2001.

AVIATION DEMAND FORECASTS

The County of Inyo recognizes the need to maintain, develop, and operate the airport for the public benefit. Therefore, the ability of the existing facility to meet changing demands was examined by first preparing reasonable estimates of future aviation demand. Forecasts were prepared for several indicators, including annual operations (takeoffs and landings), itinerant vs. local activity, peak period operations, and the total numbers and types of aircraft based at the airport. In addition, the commercial airline potential was evaluated, taking into consideration the scheduled passenger traffic which was experienced at the airport in the past, and the local population. While serving as the basis for the evaluation of facility needs, the forecasts were also used to assess existing and future noise exposure impacts. The adjacent exhibit summarizes the forecasts which were completed for the master planning process.

RECOMMENDED DEVELOPMENT PROGRAM

A program for the orderly development of the airport has been prepared and presented in the master plan, and repeated on the accompanying exhibit. In 2001, the County initiated the construction of a new terminal and restaurant, scheduled for completion by early 2002. This will create an entirely new interface for users of the facility, and a new "front door" to the area.

Within the first five years of the plan, several projects are recommended, including: taxiway reconstruction, new water service and hydrants, new aircraft storage hangars, runway end identification lights, and new access roads to development sites. During the intermediate years of the plan, new ramp areas and taxiways will be constructed, and a new access road will be developed into the airport from Wye Road. In the long term, plans reflect an extension of the primary runway to 8,900 feet, runway approach lighting, a new fire truck and building, and new navigational aid equipment. Throughout the plan period, the business park infrastructure will continue to be developed in the southwest quadrant of the airport.

The plan also addressed the requirements of Federal Aviation Regulation Part 139, with which the airport would be required to comply if scheduled airline service is resumed. Each specific section under Part 139 was evaluated to provide the County with the immediate and on-going requirements of this regulation.

Cost estimates were prepared for each development item, although more detailed estimates will need to be prepared as projects are prepared for bid. Based upon the preliminary cost estimates, complete implementation of the plan will take a financial commitment of $16 million. A high percentage of the program costs will be eligible for funding assistance through the Airport Improvement Program, a grant-in-aid program administered by the FAA which is funded with aviation ticket and fuel tax receipts. For more detailed information on the recommendations of the study, refer to the final technical report on file with the Public Works Department in Independence and in the Airport Manager's office at the Bishop Airport.

IMPLEMENTATION

Successful implementation of the plan will require that the County of Inyo remain flexible to respond to unforeseen demands, while continuing to satisfy safety and design standards imposed by the Federal Aviation Administration. New mapping and capital programming will provide a viable platform for future updates, which is a necessity when receiving federal grants on an annual basis.

In summary, the planning process requires that the County of Inyo continually monitor the need for new or rehabilitated facilities, since applications (for federally eligible projects) must be submitted with the FAA each year. The short-term (5-year) program included in the master plan will need to be updated each year to reflect the highest priority projects under consideration for funding.

Chapter One
INVENTORY

CHAPTER ONE

INVENTORY

The initial step in the preparation of the Airport Master Plan for Bishop Airport is the collection of information pertaining to the airport and the area the airport serves. This chapter assembles collected information which will be used in subsequent analyses in this study. Within this chapter is an inventory of existing airport facilities, area airspace, and air traffic control. Additionally, background information regarding the regional area is collected. This includes information regarding the airport's role in regional, state, and national aviation systems, surface transportation, and population. This information was obtained through on-site inspections of the airport, interviews with County staff, airport tenants and documents provided by the Federal Aviation Administration (FAA), CALTRANS, Inyo County, and the City of Bishop.

BACKGROUND

Inyo County, an Indian name meaning "dwelling place in the great spirit", was formed in 1866. Inyo County contains remarkable topographic features not often found. Within the county lines is the highest and lowest point in the contiguous United States. Inyo County is home to natural scenery that brings millions of visitors yearly.

Inyo County contains several cities located along U.S. Highway 395: Bishop, Lone Pine, Big Pine, and Independence, the county seat, are the primary communities. Bishop is located at the intersection of U.S. Highways 6 and 395. The City is a major commercial center for the County.

Bishop Airport is located on a 831 acre site, approximately 2 miles east of the City, along Poleta Road. As shown on **Exhibit 1A**, the airport entrance road intersects with Poleta Road, which provides primary access to the airport site.

Presently, the Bishop Airport property is owned by the Los Angeles Department of Water and Power (LADWP) but leased to the County of Inyo for daily operational management, maintenance and development. LADWP and Inyo County executed the original lease agreement in 1929. The lease agreement is the formalized agreement for the operation of Bishop Airport. Responsibility for operation of the airport has been delegated to the Inyo County Department of Public Works.

AIRPORT FACILITIES

Airport facilities can be functionally classified into two broad categories: airside and landside. The airside category includes those facilities directly associated with aircraft operations. The landside category includes facilities necessary to provide a safe transition from surface to air transportation and facilities supporting both landside and airside operations.

AIRSIDE FACILITIES

Airside facilities include runways, taxiways, airport lighting and navigational aids. Airside facilities were previously identified on **Exhibit 1A**. **Table 1A** summarizes airside facility data.

Runways

There are three runways available for use at Bishop Airport: Runway 12-30, Runway 16-34, and Runway 7-25. Runway 12-30 serves as the primary runway. It is 7,498 feet long, 100 feet wide, and oriented in an northwest-southeast direction.

Runway 12-30 is constructed of asphalt and has a pavement single wheel loading (SWL) strength rating of 70,000 pounds, 110,000 pounds dual wheel loading (DWL), and 200,000 pounds dual tandem wheel loading (DTWL). The runway has 10-foot paved shoulders.

Runway 16-34 is oriented in a north-south direction and is 5,600 feet long and 100 feet wide. Runway 16-34[1] serves as a crosswind runway for Runway 12-30. Runway 16-34 is constructed of asphalt with a porous friction course and has a pavement strength rating of 100,000 pounds SWL, 140,000 DWL, and 240,000 pounds DTWL.

Runway 7-25 is oriented in a east-west direction and is constructed of asphalt and has a SWL strength of 40,000 pounds, 56,000 pounds DWL, and 98,000 pounds DTWL[1].

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[1] Single wheel loading refers to the design of certain aircraft landing gear which have a single wheel on each main landing gear strut. Dual wheel loading refers to certain aircraft landing gear which have two wheels on each main landing gear strut. Dual tandem wheel loading refers to certain aircraft landing gear which have four wheels on each main landing gear strut.

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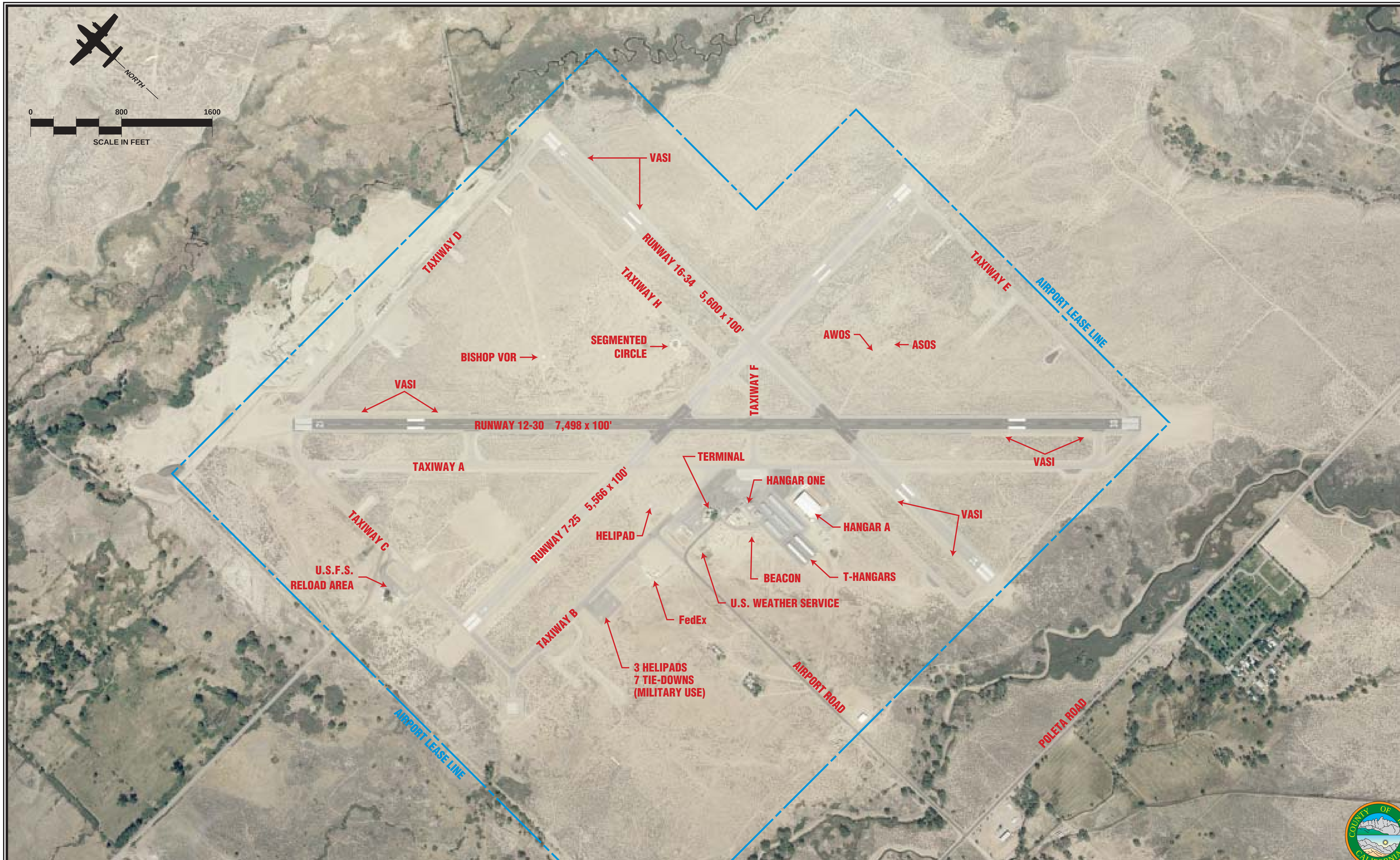

Exhibit 1A
AIRPORT FACILITIES

Runway 7-25 also serves as a crosswind runway. In this manner, Runway 7-25 provides an alternate landing surface for aircraft when conditions are not favorable to landing on Runway 12-30. Generally, aircraft land directly into the wind and have little tolerance for wind flowing perpendicular to the travel of the aircraft (defined as a crosswind).

TABLE 1A
Airside Facility Data

	Runway 7-25	**Runway 12-30**	**Runway 16-34**
Runway Length (feet) Runway Width (feet)	5,566 100	7,498 100	5,600 100
Runway Surface Surface Treatment Condition	Asphalt None Good	Asphalt Porous Friction Course Good	Asphalt Porous Friction Course Good
Runway Load Bearing Strength (pounds) Single Wheel Loading Dual Wheel Dual Tandem Wheel	 40,000 56,000 98,000	 70,000 110,000 200,000	 100,000 140,000 240,000
Pavement Edge Lighting Runway Lighting Taxiway Lighting	 MIRL MITL	 HIRL MITL	 HIRL MITL
Approach Aids	none	VASI	VASI
Traffic Pattern	left at 1,000 ft. AGL	left at 1,000 feet AGL	left at 1,000 feet AGL
Runway Pavement Markings	Nonprecision instrument	Nonprecision instrument	Nonprecision instrument
Taxiway, Taxilanes, Apron Pavement Markings	Centerline (partial), Tiedown		
Instrument Approach Procedures	VOR/DME Rwy 7-25, Rwy 12-30, and Rwy 16-34		
Other Facilities	Airport Beacon, Segmented Circle, Wind Sock, Wind Tee, ASOS, VOR-DME		

MIRL-Medium Intensity Runway Lights
HIRL - High Intensity Runway Lights
MITL - Medium Intensity Taxiway Lights
VASI-Visual Approach Slope Indicator
AGL-Above Ground Level
ASOS - Airport Surface Observation System

Source: Airport Master Records, U.S. Terminal Procedures, Southwest Volume 2 of 2.

Helipads

There are five helipads located at Bishop Airport. The first helipad is located north of the west end of the apron and is 40 feet by 40 feet. The second helipad is located southwest of the Taxiway C/Taxiway B intersection. This helipad is larger, measuring 100 feet by 100 feet. The remaining 3 helipads are located west of the FedEx facility south of Taxiway B. These helipads are for military use primarily but are used for overflow when necessary. Additionally, this area is also used as an overflow tiedown area.

Taxiways

The taxiway system at the airport is identified on **Exhibit 1A.** Taxiway A serves as the full-length parallel taxiway for Runway 12-30. Taxiway A is located 400 feet southwest of Runway 12-30. Taxiway A is 50 feet wide. Taxiway B extends east from the southern end of Taxiway C to intersect with Taxiway A. Taxiway B is 50 feet wide.

Taxiway C extends north from the west end of Taxiway B crossing the threshold of Runway 7 to Taxiway A. Taxiway C is 50 feet wide. Taxiway D extends between the Runway 12 and Runway 16 thresholds. Taxiway D is 50 feet wide. Taxiway E extends between the Runway 25 and Runway 30 thresholds. Taxiway E is 50 feet wide. Taxiway F extends between the Runway 16-34/Runway 7-25 intersection and the aircraft tiedown apron, crossing Runway 12-30. Taxiway F is 50 feet wide. Taxiway G extends southwest from the Taxiway C/Taxiway B intersection leading to a helipad. Taxiway is G is 50 feet wide. Taxiway H serves as a parallel taxiway for Runway 16-34. Taxiway H is located 350 feet west of Runway 16-34. Taxiway H is 50 feet wide.

Airfield Lighting

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

Identification Lighting: The location of an airport at night is universally indicated by a rotating beacon. A rotating beacon projects two beams of light, one white and one green, 180 degrees apart. The rotating beacon at the airport is located on the southwest side of the tiedown apron.

Runway and Taxiway Lighting: Runway and taxiway lighting utilizes light fixtures placed near the pavement edge to define the lateral limits of the pavement. This lighting is essential for safe operations during night and/or times of low visibility in order to maintain safe and efficient access to and from the runway and aircraft parking areas. Runway 7-25 is equipped with medium intensity runway lights (MIRL). Runway 12-30 and Runway 16-34 are equipped with high intensity runway lights (HIRL).

Taxiway Lighting

All parallel taxiways are lighted. Perimeter taxiways are not lighted.

Airfield Signs: Lighted airfield signs are installed at all taxiway and runway intersections. Airfield identification signs assist pilots in identifying their location on the airfield and direct them to their desired location. Lighted airfield signs also indicate pavement strength limitations on certain taxiway segments at the airport.

Visual Approach Lighting: A visual approach slope indicator (VASI) is installed at both ends of Runway 16-34 and Runway 12-30. The VASI consists of a configuration of lights near the runway threshold which enables pilots to determine whether they are above or below the designated descent path to the end of the runway.

Pavement Markings

Pavement markings aid in the movement of aircraft along airport surfaces and identify closed or hazardous areas on the airport. The non-precision markings on Runways 7-25, 12-30, and 16-34 identify the runway centerline, threshold, designation, and aircraft holding positions. Taxiway and apron taxilane centerline markings are provided to assist aircraft using these airport surfaces. Pavement markings also identify aircraft parking positions.

LANDSIDE FACILITIES

Landside facilities include aircraft storage facilities, aircraft parking aprons, and support facilities such as fuel storage and airport maintenance facilities. Within this discussion is a summary of general aviation services provided at the airport. Landside facilities are identified on **Exhibits 1A and 1B**.

Aircraft Parking Apron

The aircraft parking apron at Bishop Airport is constructed of concrete and encompasses approximately 42,000 square yards, providing space for aircraft movement and local and transient aircraft tiedowns. Approximately 35 aircraft tiedowns are available for aircraft parking.

General Aviation Terminal Building and Services

The general aviation terminal building is located along the southwest edge of the aircraft parking apron, northwest of the T-hangars. This building is in poor condition and encompasses approximately 2,240 square feet. Space is provided within the building for general office facilities and a small restaurant.

The County of Inyo is the primary tenant of the terminal building. Hangar One occupies a small office used for training.

A small restaurant called the Airport Café also occupies a portion of the terminal building.

The County of Inyo provides fuel services at the airport. There are fast-pay pumps and fuel truck services available.

Hangar One is the primary private provider of services to general aviation aircraft at Bishop Airport. Hangar One provides aircraft maintenance, sales, rentals, flight training, charter, and glider tow services.

Owens Valley Aviation provides aircraft maintenance services for general aviation customers.

Sierra Aviation provides Life Flight services from Bishop Airport.

Aircraft Storage Hangars

A large conventional hangar (approximately 26,000 square feet in size) is located on the southeastern edge of the aircraft parking apron. The building was constructed in late 1977 and is in fair condition. This hangar is used for office space and aircraft storage. Current occupants of the hangar include Sierra Aviation, Owens Valley Aviation, and several privately owned aircraft. There are a total of 16 county-owned aircraft storage hangars (totaling approximately 86,000 square feet) located along the southern edge of the apron, east of the terminal building. These hangars provide space for 52 aircraft. There is currently a waiting list of 35-40 aircraft for hangar space.

Aircraft Rescue and Firefighting

The County of Inyo maintains a small Fire House/Maintenance building to store firefighting equipment. Firefighting services are provided by volunteer firefighters.

Airport Maintenance

All maintenance activities at the Airport are handled by the County of Inyo staff. The County keeps a snow plow, a sweeper vehicle and two pickup trucks on site for day to day maintenance.

Fuel Storage

All aircraft fuel storage facilities at Bishop Airport are located east of the terminal building. Fuel storage totals 24,000 gallons and includes 12,000 gallons for Jet-A fuel and 12,000 gallons for 100LL fuel in separate tanks. All fuel storage tanks are located above-ground. The fuel storage tanks are owned by the County of Inyo and operated by the County.

Fuel is dispensed through a stationary fuel island located adjacent to the fuel storage tanks. Mobile fuel delivery is also available for both Jet-A and 100LL fuel. A 2,000 gallon fuel truck is used for Jet-A delivery. A 1,200 gallon fuel truck used for the delivery of 100LL fuel. The fuel tanks were installed in 1998 and are in excellent condition.

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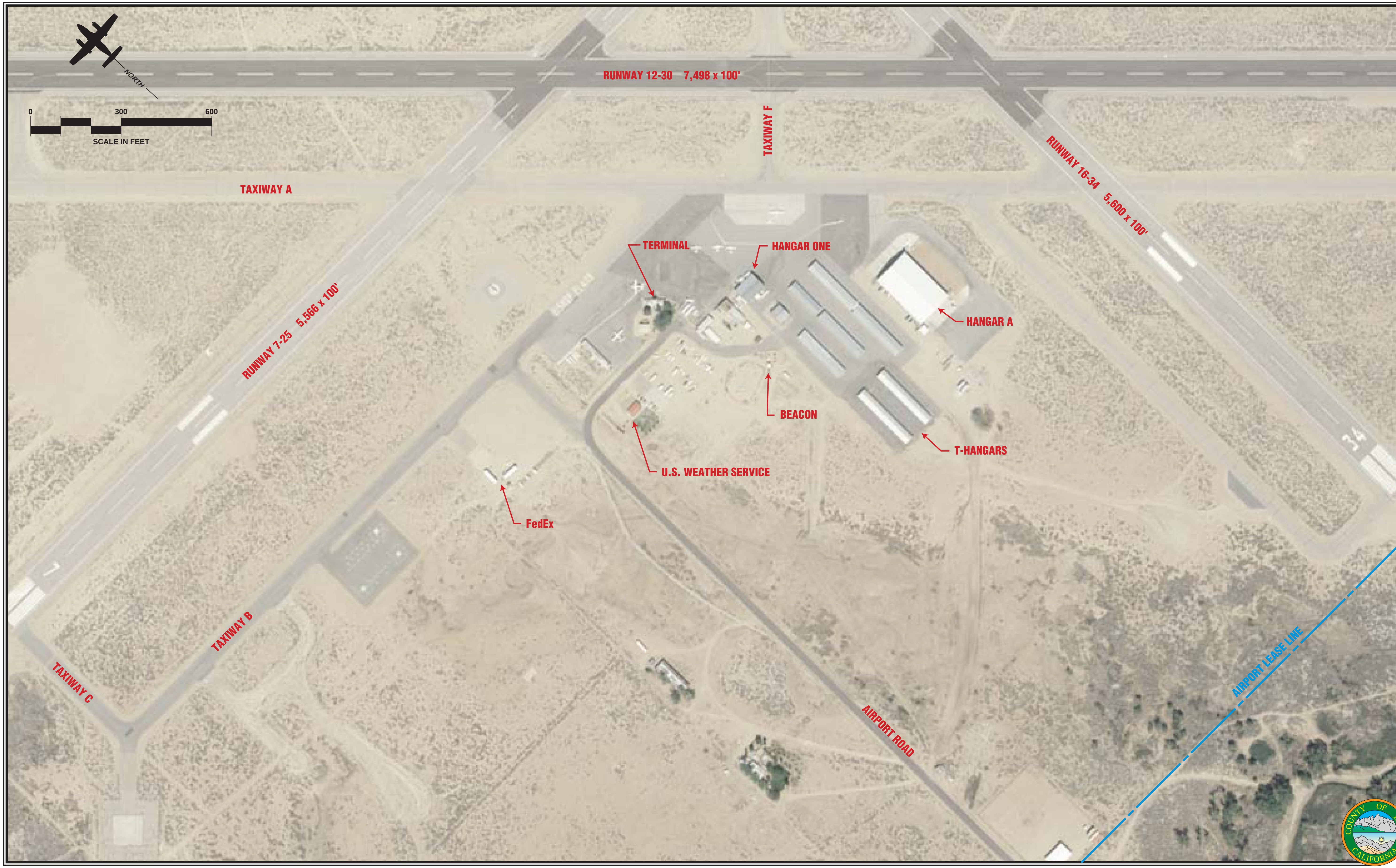

Exhibit 1B
LANDSIDE FACILITIES

Perimeter Fencing

A four-foot barbed-wire fence runs the entire perimeter of Bishop Airport. This fence does not provide security for the airport but establishes the boundary of airport property.

Utilities

Electrical power at the airport is provided by Southern California Edison. Water and sewer services are provided by on-site services: septic system for sewage and a well for water supply. The water and sanitary sewer services are provided by on site services (Septic system for sewage and well for water supply). Phone service is provided by Verizon. Propane services are provided by local vendors.

Automated Surface Observation System

An Automated Surface Observation System (ASOS) is installed at Bishop Airport. The ASOS provides automated aviation weather observations 24 hours a day. The system updates weather observations every minute, continuously reporting significant weather changes as they occur. The ASOS system reports cloud ceiling, visibility, temperature, dew point, wind direction and speed, altimeter setting (barometric pressure), and density altitude (pressure altitude corrected for nonstandard temperature).

The ASOS is located north of Runway 12-30 and east of Runway 16-34.

Airport Tenants

The following list summarizes the other non-aviation related organizations and/or businesses which are also located at Bishop Airport. The location of each of these organizations/businesses were previously identified on **Exhibit 1A** and **Exhibit 1B**.

Airport Café
Hangar One
U.S. Weather Service
Westar Cable
FedEx
Sierra Aviation Life Flight
Owens Valley Aviation
U.S. Forest Service
Batchelder Enterprises

NAVIGATIONAL AIDS

Navigational aids are electronic devices that transmit radio frequencies which properly equipped aircraft and pilots translate into point-to-point guidance and position information. The types of electronic navigational aids available for aircraft flying to or from Bishop Airport include a very high frequency omnidirectional range (VOR) facility.

The VOR, in general, provides azimuth readings to pilots of properly equipped aircraft by transmitting a radio signal at every degree to provide 360 individual navigational courses. Frequently, distance measuring equipment (DME) is combined with a VOR facility (VOR-DME) to provide distance as well as direction information to the pilot. **Exhibit 1C** depicts the location of the Bishop VOR-

DME in relation to Bishop Airport. Due to local terrain, the Bishop VOR is of limited value at low altitudes. Loran-C is a ground-based enroute navigational aid which utilizes a system of transmitters located in various locations across the continental United States. Loran-C varies from the VOR as pilots are not required to navigate using a specific facility (with the VOR, pilots must navigate to and from a specific VOR facility). With a properly equipped aircraft, pilots can navigate to any airport in the United States using Loran-C.

GPS is an additional navigational aid for pilots enroute to the airport. GPS was initially developed by the United States Department of Defense for military navigation around the world. Increasingly, GPS has been utilized more in civilian aircraft. GPS uses satellites placed in orbit around the globe to transmit electronic signals which properly equipped aircraft use to determine altitude, speed, and navigational information. GPS is similar to Loran-C as pilots can directly navigate to any airport in the country and are not required to navigate using a specific navigational facility. The FAA is proceeding with a program to gradually replace all traditional enroute navigational aids with GPS over the next twenty years.

Instrument Approach Procedures

Instrument approach procedures are a series of predetermined maneuvers established by the FAA using electronic navigational aids that assist pilots in locating and landing at an airport during low visibility and cloud ceiling conditions. There are currently 2 circling instrument approach procedures to Bishop Airport.

The first is a VOR/DME or GPS approach and provides for landings when cloud ceilings are as low as 2,200 feet and visibility is restricted to 1 1/4 mile for aircraft with approach speeds less than 90 knots. For aircraft with approach speeds between 91 and 120 knots the cloud ceiling minimums remain unchanged while the visibility requirements increase to 1 ½ miles. For aircraft with approach speeds higher 121 knots and higher the visibility requirements increase to 3 miles while the ceiling requirements stay unchanged.

The second approach, a VOR or GPS circling approach provides for landings when cloud ceilings are as low as 3,300 feet and visibility is restricted to 1 1/4 mile for aircraft with approach speeds less than 90 knots. For aircraft with approach speeds between 91 and 120 knots the cloud ceiling minimums remain unchanged while the visibility requirements increase to 1 ½ miles. For aircraft with approach speeds higher 121 knots and higher the visibility requirements increase to 3 miles while the ceiling requirements stay unchanged.

Air Traffic Control

Bishop Airport does not have an airport traffic control tower; therefore, no formal terminal air traffic control

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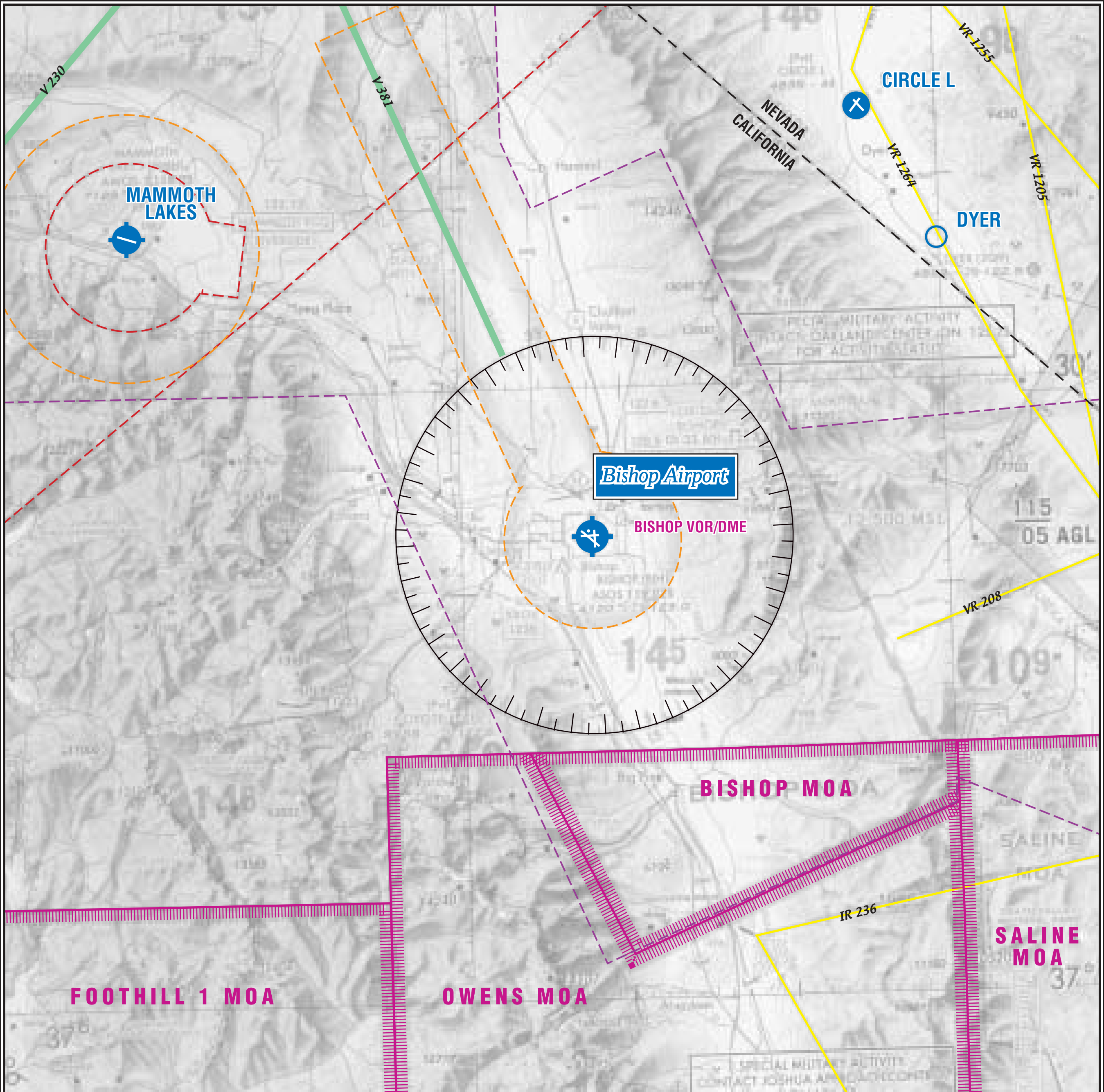

LEGEND

- Airport with other than hard-surfaced runways
- Airports with hard-surfaced runways 1500 ft. to 8069 ft.
- Compass Rose
- Victor Airways
- Military Training Routes
- Military Operations Area (MOA)
- State Border
- Class E Airspace
- Class E Airspace with floor 700' above surface
- Class E Airspace with floor 1200' or greater above surface that abuts Class G airspace

NORTH

NOT TO SCALE

Source: San Francisco Sectional Aeronautical Chart
National Oceanic and Atmospheric
Administration (NOAA)
Effective Date: February 24, 2000

COUNTY OF INYO CALIFORNIA

Exhibit 1C
AREA AIRSPACE

services are available. Aircraft operating in the vicinity of the airport are not required to file any type of flight plan or to contact any air traffic control facility unless they are entering airspace where contact is mandatory. Air traffic advisories and certain weather information can be obtained using the airport unicom (operated by Inyo County). Enroute air traffic control services are provided through the Oakland Air Route Traffic Control Facility (ARTCC), which controls aircraft in a large multi-state area.

Local Operating Procedures

Bishop Airport is situated at 4,120 feet MSL. The traffic pattern altitude for all aircraft at the airport is 1000 feet above the airfield's elevation (5,120 feet MSL). All runways utilize a left hand traffic pattern. In this manner, aircraft approach the desired runway end following a series of left-hand turns.

Runway use is dictated by wind conditions. Ideally, it is desirable for aircraft to land directly into the wind. Prevailing wind flow is from the northwest leading to a greater use of Runway 12-30.

VICINITY AIRSPACE

To ensure a safe and efficient airspace environment for all aspects of aviation, the FAA has established an airspace structure that regulates and establishes procedures for aircraft using the National Airspace System. The U.S. airspace structure provides for two basic categories of airspace, controlled and uncontrolled, and identifies them as Classes A, B, C, D, E, and G.

Class A airspace is controlled airspace and includes all airspace from 18,000 feet mean sea level (MSL) to Flight Level 600 (approximately 60,000 feet MSL). Class B airspace is controlled airspace surrounding high capacity commercial service airports (i.e. Phoenix Sky Harbor International Airport, Los Angeles International Airport). Class C airspace is controlled airspace surrounding lower activity commercial service (i.e. Tucson International Airport) and some military airports. Class D airspace is controlled airspace surrounding airports with an airport traffic control tower. All aircraft operating within Class A, B, C, and D airspace must be in contact with the air traffic control facility responsible for that particular airspace. Class E is controlled airspace that encompasses all instrument approach procedures and low altitude federal airways. Only aircraft conducting instrument flights are required to be in contact with air traffic control when operating within Class E airspace. While aircraft conducting visual flights in Class E airspace are not required to be in radio communications with air traffic control facilities, visual flight can only be conducted if minimum visibility and cloud ceilings exist. Class G airspace is uncontrolled airspace that does not require contact with an air traffic control facility.

The airspace in the vicinity of Bishop Airport is depicted on **Exhibit 1C**. The regional airspace is impacted by the high volume of military aircraft operating in the region. This is evidenced by the large military operations areas and restricted areas.

The airspace extending for an approximate nine Nautical Mile (NM) radius around Bishop Airport is Class E airspace that extends from 700 feet above the surface to 18,000 feet MSL. Class E airspace with a floor 700 feet above the surface extends to the north and west of the airport for 26 NM to protect a low altitude Federal (Victor) airway. Victor airways are corridors of airspace eight miles wide that extend upward from 1,200 feet AGL to 18,000 feet MSL, and extend between VOR navigational facilities. The Victor airway in the vicinity of Bishop Airport emanate from the Bishop VOR-DME and extends to the northwest.

Located to the south of Bishop Airport are areas of special-use airspace designated as a Military Operations Area (MOA). MOAs define airspace where a high level of military activity is conducted and are intended to segregate military and civilian aircraft. While civilian aircraft operations are not restricted in the MOA, civilian aircraft are cautioned to be alert for military aircraft. **Table 1B** summarizes data for the MOAs in the vicinity of Bishop Airport.

While not considered part of the U.S. Airspace Structure, the boundaries of National Park Service Areas, and U.S. and Wildlife Service areas, and U.S. Forest Wilderness and Primitive areas are noted on aeronautical charts. While aircraft operations are not specifically restricted over these areas, aircraft are requested to maintain a minimum altitude of 2,000 feet above the surface.

TABLE 1B
Military Operations Area (MOA) and Restricted Area Data

Name/Number	Altitudes	Time of Use
MOA		
Bishop	200 Feet AGL to 18,000 Feet MSL	6:00 a.m. to 10:00 p.m Monday - Friday
Saline	200 Feet AGL to 18,000 Feet MSL	6:00 a.m. to 10:00 p.m Monday - Friday
Owens	200 Feet AGL to 18,000 Feet MSL	6:00 a.m. to 10:00 p.m Monday - Friday
Foothill 1	2,000 Feet AGL to 18,000 Feet MSL	Intermittent by NOTAM

Regional Airports

A review of the airports within 50 nautical miles of the Bishop Airport was made to identify and distinguish the type of air service provided in the area surrounding the airport. The location of these airports from Bishop Airport are depicted on **Exhibit 1C**. Information on each airport was derived from the *FAA 5010-1 Airport Master Record Form*.

Dyer Airport is located approximately 22 nautical miles (NM) north-east of Bishop Airport. A single dirt runway 2,870 feet long, in good condition, is available for use. There are six based aircraft at Dyer. There are no general aviation services available. Approximately 40 operations are conducted annually at Dyer Airport.

Mammoth Yosemite Airport is located approximately 27 nautical miles west-northwest of Bishop Airport in Mammoth Lakes, California. A single asphalt runway 7,000 feet long is available for use. Approximately 12,775 operations are conducted annually at Mammoth Yosemite Airport. There are approximately 41 based aircraft at the airport. A full range of general aviation services are available at Mammoth Yosemite Airport.

Independence Airport is located 34.4 NM south-southeast of Bishop Airport. A single asphalt runway 3,722 feet long, in good condition is available for use. In addition, a 1,610 foot dirt runway is available for use in extreme crosswind conditions only. There are two aircraft based at Independence. There are no general aviation services available. Approximately 3,000 operations are conducted annually at Independence Airport.

Lone Pine Airport is 49.4 NM south-southeast of Bishop Airport. A single asphalt runway 4,000 feet long is available for use. Additionally there is a 2,400 foot dirt runway that is generally restricted to glider use. A single 30x30 foot helipad is available for use. There are 14 based aircraft at Lone Pine. A range of services is available including; fuel, oxygen and glider towing. Approximately 8,600 operations are conducted annually at Lone Pine Airport.

Lee Vining Airport is located 49.8 NM northwest of Bishop Airport. A 4,090 foot asphalt runway, in poor condition, is available for use. There are no services available. There are no based aircraft at Lee Vining. Approximately 2,000 operations are conducted annually at Lee Vining Airport.

AIR TRAFFIC ACTIVITY

At airports serving general aviation, the number of based aircraft and the total annual operations (takeoffs and landings) are the primary indicators of aeronautical activity. These indicators will be used in subsequent analysis in the Master Plan to project future aeronautical activity and determine future facility needs.

Historical Based Aircraft

There are no accurate historical based aircraft records for Bishop Airport. By comparing current based aircraft, 75, with the number of aircraft registered in Inyo County it is safe to say there is a close correlation in these numbers. Based on this, there has been probably been a slow growth in the number of based aircraft over the past 20 years.

Historical Aircraft Operations

Without an operating airport traffic control tower, annual aircraft operations at Bishop Airport have not regularly been counted. Instead, only estimates of historical and current activity is available. Since 1980, annual operations have been estimated annually for the Federal Aviation Administration (FAA) and recorded on the *FAA 5010-1 Master Record Form* and input in the Terminal Area Forecast (TAF) system. (The TAF maintains a historical database of activity and presents 15 year forecasts for the airport.)

Table 1D summarizes historical annual operations for Bishop Airport since 1980. The totals include all operational activity at the airport (general aviation, air carrier, air taxi and military). Annual operations have fluctuated at the airport since 1980. However, the general trend has shown a slight increase during this period. Most recently, annual operations have declined from a high nearing 40,000 annually in 1990 to approximately 26,000 annually.

TABLE 1D
Historical Annual Operations

Year	Operations
1980	21,504
1985	36,500
1990	39,500
1995	26,000
2000	25,915

Source: Federal Aviation Administration, Terminal Area Forecast (TAF)

HISTORICAL COMMERCIAL AIR SERVICE

Bishop Airport has not been served by scheduled air service since 1993. Alpha Air was the last airline to serve Bishop Airport.

Historical enplanements (aircraft boardings) are shown in **Table 1E**. Historical enplanements fluctuated during the 18 year period that Bishop Airport was served by scheduled air carriers. Enplanements peaked at 6,040 in 1977 when Sierra Pacific Airlines was based at Bishop.

Air Cargo Activity

FedEx currently provides air cargo service to Bishop Airport 6 days a week. FedEx utilizes Cessna Caravan aircraft for cargo operations at the airport. FedEx occupies a storage/office trailer on the west side of Airport Road.

UPS also provides air cargo service. UPS contracts to WestAir, who in turn uses Ameriflight to provide once daily service 5 days a week to Bishop Airport. UPS has no facilities on the Airport instead relying on their facilities in downtown Bishop.

Ameriflight also operates AmFlight 132 providing courier service five days a week.

TABLE 1E Historical Enplanements	
Year	Enplanements
1976	3,812
1977	6,040
1978	5,351
1979	2,024
1980	1,373
1981	3,470
1982	2,062
1983	1,109
1984	437
1985	186
1986	308
1987	498
1988	385
1989	962
1990	330
1991	370
1992	490
1993	0

Source: Federal Aviation Administration, Terminal Area Forecast (TAF)

LAND USE

The land surrounding Bishop Airport consists primarily of undeveloped, open land. A small area of residential development is located south of the airport on Poleta Road. The town of Bishop lies to the west of the airport approximately 2 miles. Just north of the airport is a mining operation operated by Hiatt Ready Mix.

Airport Land Use Commission

The County of Inyo is responsible for the control of land use decisions for the areas surrounding Bishop Airport. The primary land use document for the areas surrounding Bishop Airport is the *1991 Policy Plan and Airport Comprehensive Land Use Plans (CLUP)*. The comprehensive land use plan is based on County and State land use guidelines. The comprehensive land use plan seeks to protect aircraft operational areas from obstructions and adjacent land uses from aircraft noise and accident potential through controlling land uses and zoning inside defined safety areas adjacent to the airport.

COMMUNITY PROFILE

The community profile includes background information regarding the City of Bishop and the regional area. This includes information regarding the airport's role in regional, state, and national aviation systems, surface transportation, climate and population.

Airport Administration

Bishop Airport is administered through the County of Inyo Public Works Department. In addition the seven member Northern Inyo County Airport Advisory Committee serves in an advisory role to the County.

Regional Setting, Access and Transportation

The City of Bishop is located in the far northern portion of Inyo County near the California and Nevada border. The City of Bishop is located at the junction of US Highway 395 and US Highway 6. US Highway 395 is a major north-south ground corridor linking Bishop to major regional metropolitan areas. US Highway 395 connects you to Los Angeles (270 miles) to the south, San Francisco via Hwy. 50 (332 miles) to the west, and US Highway 95 connects you to Las Vegas, NV (259 miles) to the southeast. **Exhibit 1D** depicts the airport in its local and regional setting.

The Airport's System Role

Airport planning exists on many levels: local, regional, state, and national. Each level has a different emphasis and purpose. This master plan is the primary local airport planning document.

At the state level, the airport is included in the *California State Aviation System Plan (SASP).* The purpose of the *SASP* is to ensure that the State has an adequate and efficient system of airports to serve its aviation needs well into the future. The *SASP* defines the specific role of each airport in the State's aviation system and establishes funding needs.

At the national level, the airport is included in the *National Plan of Integrated Airport Systems (NPIAS).* The *NPIAS (1998-2002)* includes a total of 3,561 airports (both existing and proposed) which identifies airports, together with the airport development necessary to anticipate and meet the present and future requirements in support of civil needs. An airport must be included in the *NPIAS* to be eligible for federal funding assistance. Bishop Airport is one of 134 general aviation airports in California included in the *NPIAS*.

Climate

The normal daily minimum ranges from 21.7 degrees to 56.1 degrees. Maximum daily temperatures range from 53.5 degrees in January to 97.2 degrees in July. The regional area can expect approximately 5.37 inches of rainfall annually.

Bishop Population

Historical resident population estimates for the City of Bishop are summarized in **Table 1F**.

Regional Population, Households, and Employment

Table 1G summarizes historical forecast population, household, and employment data for the County of Inyo. Steady growth is predicted in all areas.

SUMMARY

The information discussed in this inventory chapter provides a foundation upon which the remaining elements of the planning process will be constructed. This information will provide guidance, along with additional analysis and data collection, for the development of forecasts of aviation demand and facility requirements.

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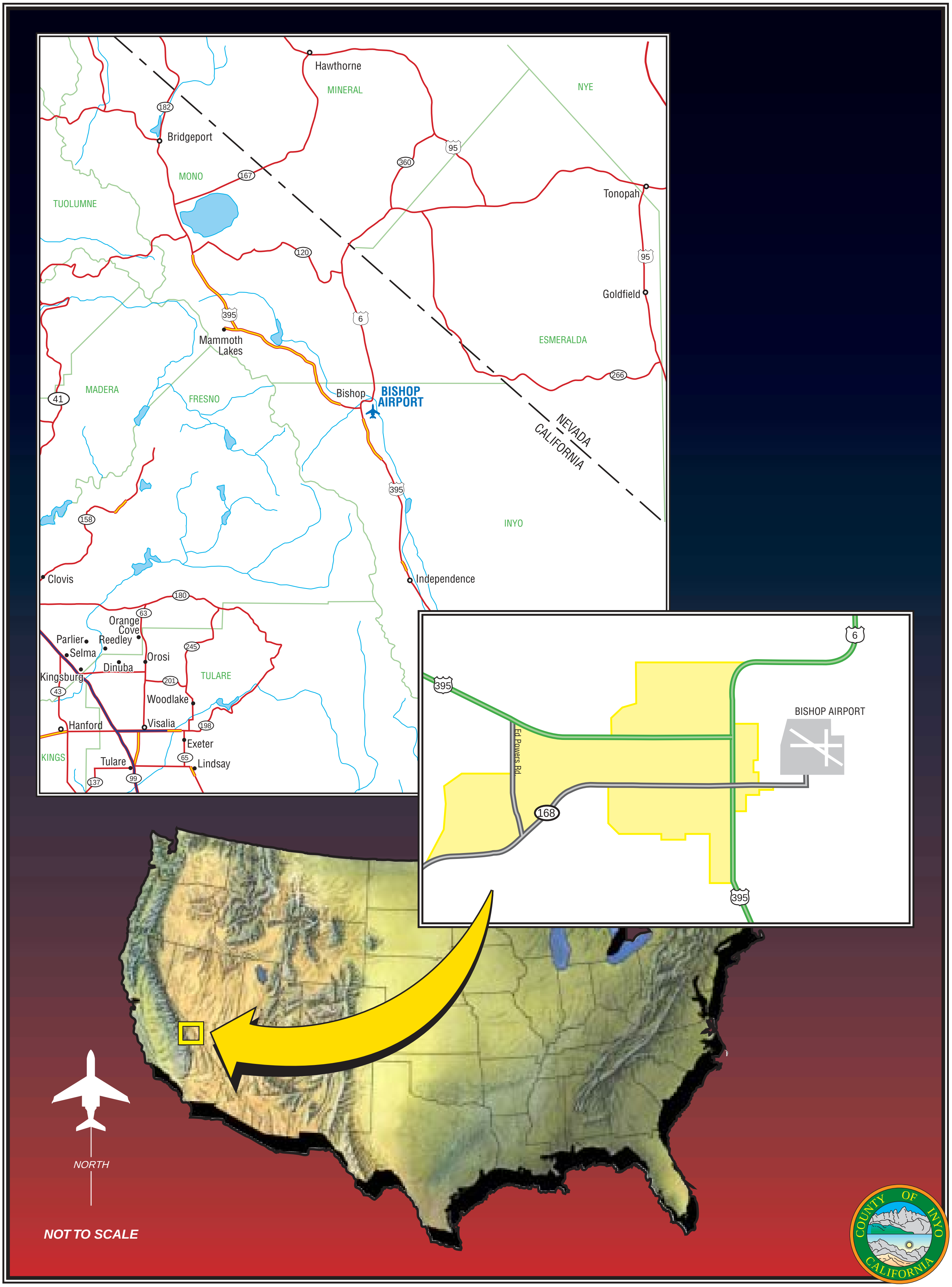

Exhibit 1D
LOCATION MAP

TABLE 1F
Historical and Forecast Population
Bishop Airport Area

Area	Year	Population	Employment
Inyo County	1970	15,620	6,370
	1980	17,910	8,540
	1990	18,270	9,460
	1998	18,120	9,900
Forecast	*2005*	*18,500*	*10,660*
	2010	*18,810*	*11,200*
	2015	*19,190*	*11,770*
	2020	*19,630*	*12,380*
California	1970	20,044,000	9,056,000
	1980	23,792,000	12,776,000
	1990	29,925,000	16,954,000
	1998	32,666,000	18,518,000
Forecast	*2005*	*34,940,000*	*20,533,000*
United States	1970	203,982,000	91,281,000
	1980	227,225,000	114,231,000
	1990	249,440,000	139,184,000
	1998	270,296,000	160,541,000
Forecast	*2005*	*286,608,000*	*177,620,000*

Source: CEDDS, 2000

TABLE 1G
Regional Forecasts
County of Inyo

Year	Population	Employment	Households
1994	18,450	9,120	7,620
2000	18,250	10,120	7,630
2005	18,500	10,660	7,800
2010	18,810	11,200	7,980
2015	19,190	11,770	8,140
2020	19,630	12,380	8,260

Source: CEDDS, 2000

DOCUMENT SOURCES

A variety of different documents were referenced for the development of the inventory chapter. The following listing reflects a partial compilation of these sources. The listing does not include data provided by the Bishop Airport or drawings which were referenced for information. An on-site inventory and interviews with airport staff and tenants contributed to the development of the inventory effort:

Airport/ Facility Directory, Southwest U.S., U.S. Department of Commerce, National Oceanic and Atmospheric Administration, August 10th, 2000.

Los Angeles Sectional Aeronautical Chart, U.S. Department of Commerce, National Oceanic and Atmospheric Administration, 65th Edition, September 7th, 2000.

National Plan of Integrated Airport System (NPIAS), U.S. Department of Transportation, Federal Aviation Administration, 1998-2002.

U.S. Terminal Procedures, Southwest Volume 2 of 2, U.S. Department of Commerce, National Oceanic and Atmospheric Administration, August 10th, 2000 Edition.

A number of Internet sites were accessed and contributed information for the inventory effort. These include:

Bishop Airport/FAA 5010 Data
http://www.airnav.com/airports/BIH

Bishop Chamber of Commerce
http://www.bishopvisitor.com

Federal Aviation Administration
http://www.faa.gov

National Oceanic & Atmospheric Administration (NOAA)
http://www.noaa.gov

GCR & Associates
http://www.gcr1.com

Chapter Two
AVIATION DEMAND FORECASTS

AVIATION DEMAND FORECASTS

The purpose of this chapter is to examine the existing and potential aviation demand for scheduled air carrier, military and general aviation activity at Bishop Airport (BIH). The proper planning of a facility of any type must begin with a definition of the demand that may occur over a specified period. Projections of specific aviation demand elements will be used to determine the types and sizes of facilities required to meet the aviation demands of the Bishop area over the next 20-years.

Air transportation is a unique industry that has experienced wide fluctuations in growth and recession. For this reason, it is important that from time to time an airport evaluate their current position and examine future demand trends and potential. This holds especially true today given limited public funding mechanisms and increased traveler needs.

The primary objective of this planning effort is to define the magnitude of change that can be expected over time. Because of the cyclical nature of the economy, it is virtually impossible to predict with certainty year-to-year fluctuations in activity when looking as far as a 20 years into the future. However, a trend can be established which delineates long-term growth potential.

While a single line is often used to express the anticipated growth, it is important to remember that actual growth may fluctuate above and below this line. The point to remember about forecasts is that they serve only as guidelines, and planning must remain flexible to respond to unforeseen facility

needs. This is because aviation activity is affected by many external influences, as well as by the types of aircraft used and the nature of available facilities.

Recognizing this, it is intended to develop a Master Plan for Bishop Airport that will be demand-based rather than time-based. As a result, the reasonable levels of activity potential that are derived from this forecasting effort will be related to the planning horizon activity levels rather than dates in time. These planning horizons will be established as levels of activity that will call for consideration of the implementation of the next step in the Master Plan program. This will be further described in subsequent chapters of this Master Plan.

Although publically owned and operated, an airport is very similar to the private business environment in many ways. Airports provide important transportation access to the community and have to recognize their position and establish well planned goals in order to better serve the community. Marketing efforts and facility development are matched to goals so that the airport can best serve the community.

In order to fully assess current and future aviation demand for Bishop Airport, an examination of several key factors is needed. These include: national and regional aviation trends, historical and forecast socioeconomic and demographic information of the area and competing transportation modes and facilities. Consideration and analysis of these factors will ensure a comprehensive outlook for future aviation demand at the Bishop Airport.

LOCAL SOCIOECONOMIC FEATURES

The local socioeconomic conditions provide an important baseline consideration for preparing aviation demand forecasts. While in most cases local socioeconomic variables such as population, employment and income cannot be relied upon to indicate the growth or decline of aviation demand, these factors can provide an important indicator for understanding the dynamics of the community and in particular the trends in economic growth.

For this study, socioeconomic variables for Inyo County have been considered. Information was obtained from the Inyo County Planning Department, and Woods and Poole Complete Economic and Demographic Data Source (CEDDS) 2000.

POPULATION

Table 2A summarizes historical and forecast population estimates for Inyo County. As shown in the table, Inyo County has experienced a very slight decline in population over the past 10 years. This trend is expected to reverse over the next twenty years with slow, but steady growth.

Unfortunately, there is no forecasted data available for the City of Bishop or the unincorporated areas of Inyo County beyond 1999. In 1990 the population of the greater Bishop area was 10,352, or 56% of the county population.

TABLE 2A Socioeconomic Forecasts					
	HISTORICAL		*FORECAST*		
	1990	**1999**	**2005**	**2010**	**2020**
Inyo County					
Population	18,270	18,200	18,500	18,810	19,630
Employment	9,460	10,010	10,660	11,200	12,380
PCPI (1998 $)	$17,767	$23,878	$30,631	$38,595	$62,355
Source: County Information from Woods & Poole, CEDDS 2000; PCPI - Per Capita Personal Income					

EMPLOYMENT

Historical and forecast employment data for Inyo County is also presented in **Table 2A**. Total employment for Inyo County has shown a slight annual increase between 1990 and 1999. During this period employment increased at an annual rate of .6% while the County population was declining.

Employment forecasts for Inyo County indicate moderate growth increasing at an annual average rate of 1.0 percent by 2020.

PER CAPITA PERSONAL INCOME (PCPI)

Table 2A compares per capita personal income (adjusted to 1998$) for Inyo County. Between 1990 and 1999, the Inyo County adjusted PCPI grew by 3.3 percent annually. From 1999 through the year 2020, the Inyo County adjusted PCPI growth is expected at 4.6 percent annually reaching $62,355.

FORECASTING APPROACH

The development of aviation forecasts proceeds through both analytical and judgmental processes. A series of mathematical relationships are tested to establish statistical logic and rationale for projected growth. However, the judgement of the forecast analyst, based upon professional experience, knowledge of the aviation industry, and his/her assessment of the local situation, is important in the final determination of the preferred forecast.

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

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

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

In regression analysis, values for the aviation demand in question (i.e. based aircraft), the dependent variable, are projected on the basis of one or more other indicators, the independent variable. 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, to project corresponding values of the dependent variable.

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

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

A wide range of factors are known to influence the aviation industry and can have significant impacts on the extent and nature of air service provided in both the local and national market. Technological advances in aviation have historically altered, and will continue to change, the growth rates in aviation demand over time. The most obvious example is the impact of jet aircraft on the aviation industry, which resulted in a growth rate that far exceeded expectations. Such changes are difficult, if not impossible to predict, and there is simply no mathematical way to estimate their impacts. Using a broad spectrum of local, regional and national socioeconomic and aviation information, and analyzing the most current aviation trends, forecasts are presented in the following sections.

The following forecast analysis examines each of the aviation demand categories for Bishop Airport over the next twenty years. These include commercial airline potential, general aviation and military activity. Each segment will be examined individually and collectively to provide an understanding of the overall aviation activity at Bishop Airport through 2020.

COMMERCIAL AIRLINE POTENTIAL

Bishop Airport is not currently served by a scheduled commercial airline. In addition, there is currently no commercial service available within 200 miles. Several factors, including runway lengths, choice of runways, instrument approach capabilities, and a growing tourism industry, make Bishop Airport a likely candidate to attract scheduled air service.

The Bishop Airport has provided commercial service in the past. The airport was served by commercial carriers until 1993. **Table 2B** summarizes historical passenger enplanement (boardings) data for the Bishop Airport and compares them with U.S. domestic enplanements.

After peaking at 6,040 in 1977, enplanements at Bishop declined steadily through 1993 when service was discontinued. This trend was not uncommon in smaller communities such as Bishop after airline deregulation in 1978.

Several communities surrounding Bishop offer scheduled commercial flights. Reno, Las Vegas, Los Angeles, Inyokern, and Bakersfield all have scheduled service. While this places commercial air service within reach of Bishop area residents, most of these cities are at least 200 miles from the Bishop Airport, posing a significant drive time.

Much closer to Bishop, Mammoth-Yosemite Airport is currently negotiating for the return of commercial service from American Airlines. As part of the deal Mammoth has committed to a 5-year subsidy to American Airlines guaranteeing 55% to 65% load factors on flights into Mammoth-Yosemite Airport. Mammoth is also attempting to secure a $30 million grant from the FAA for airport improvements. This could impact the feasibility of commercial service at Bishop.

Mammoth and American Airlines are targeting 2001 for the start of twice daily flights from Dallas and Chicago. Daily flights from Los Angeles and the Bay Area are scheduled to begin within a year following that.

If the Mammoth deal with American Airlines does not come through, Bishop needs to be ready to step forward as the most likely alternative.

Bishop has the runway system in place to easily support daily flights into the Bishop Airport. With crosswind runways as well, flights in poor weather conditions would be more favorable into Bishop. Bishop would need to provide a larger passenger terminal. Fortunately, there are currently funds in place for the construction of a new terminal building at the Bishop Airport.

Despite the ground access times, many travelers will continue to choose other airports as low cost alternatives. Business travelers, however, often prefer convenience and are willing to pay more for a more convenient and time saving alternative. Additionally, many leisure travelers with limited time may be willing to pay more for the time savings. Enplanement projections based on capturing the same percentage of travelers would yield nearly 20,000 enplaned passengers by 2020. This percentage is based on the number of enplaned passengers at Bishop Airport compared to the total number of U.S. domestic enplaned passengers as projected by the F.A.A. in "FAA Aerospace Forecasts, Fiscal Years 2000-2011". Achieving this level will be a difficult task with the number of airports in the region providing commercial service and the limited population base. It is much more likely to see numbers approaching 10,000 passengers by the year 2020.

TABLE 2B
Historical Enplanements

Year	U.S. Domestic (millions)	Bishop Airport	% of National
1976	195.1	3812	0.00195%
1977	216.6	6040	0.00278%
1978	246.7	5351	0.00216%
1979	287.1	2024	0.00070%
1980	287.9	1373	0.00047%
1981	274.7	3470	0.00126%
1982	286.0	2062	0.00072%
1983	308.1	1109	0.00035%
1984	333.8	437	0.00013%
1985	369.9	186	0.00005%
1986	404.7	308	0.00007%
1987	441.2	498	0.00011%
1988	441.2	385	0.00008%
1989	443.6	962	0.00021%
1990	456.6	330	0.00007%
1991	445.9	370	0.00008%
1992	464.7	490	0.00010%
1993	470.4	0	0.00000%
1994	511.3	0	0.00000%
1995	531.1	0	0.00000%
1996	558.1	0	0.00000%
1997	577.8	0	0.00000%
1998	600.6	0	0.00000%

Bishop's proximity to the Mammoth Airport is viewed as a limiting factor to the return of scheduled air service to Bishop, but only if Mammoth is successful in securing scheduled service.

Should Mammoth be unsuccessful, and Bishop be able to attract scheduled air service, it is still very likely that the community would need to provide marketing and subsidies to the air carrier.

The most important factors in creating and sustaining scheduled air service is the frequency of service and air fares. Competitive fares will attract travelers who would normally travel to other airports while frequency of service will make travel more convenient.

TABLE 2C
Enplanement Projections as Market Share of National

Year	U.S. Domestic Enplanements (in millions)	Bishop Airport Enplanements	Share of U.S. Enplanements (%)
Peak Years Average (1976-1983)	262.8	3,155	0.0012%
CONSTANT SHARE PROJECTION			
2005	701.0	10,515	0.0015%
2010	848.5	12,727	0.0015%
2020	1,174.0	17,610	0.0015%

Source: U.S. Domestic Enplanements, FAA Aviation Forecasts, 2000-2009

GENERAL AVIATION

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

- Based Aircraft
- Based Aircraft Fleet Mix
- Local and Itinerant Operations

NATIONAL TRENDS

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

According to the General Aviation Manufacturers Association (GAMA), aircraft shipments and billings grew for the fifth consecutive year in 1999, following fourteen years of annual declines. In the first three quarters of 1999, general aviation aircraft manufacturers shipped a total of 1,692 aircraft, 13.4 percent higher than the same period in 1998. Shipments of piston aircraft and jets were up 10.8 and 26.2 percent, respectively. Turboprop shipments increased 14.8% in 1998 and 8.6 percent through the first three quarters of 1999.

Both the number of active pilots and student pilot starts were up in 1998. Total active pilot numbers increased by 3.5 percent in 1999 over 1998, eclipsing the 0.3 percent gain the previous year. For 1999, student pilot starts increased for the third consecutive year, increasing by 4.4 percent over 1998. These student pilots are the future of general aviation and are one of the key factors impacting the future direction of the general aviation industry. Since most pilot training activities are conducted using general aviation aircraft, the increases in new pilot starts and increases in advanced training discussed above are one of the primary reasons for the resurgence in general aviation over the past years. These increases combined with the increases in piston-powered aircraft shipments and aircraft production are tangible evidence of the resurgence of the industry and that many of the industry initiated programs to revitalize general aviation have begun to yield substantive results.

Manufacturer and industry programs and initiatives continue to revitalize the general aviation industry. Notable initiatives include the "No Plane, No Gain" campaign sponsored by the General Aviation Manufacturers Association (GAMA) and the National Business Aviation Association (NBAA), "Project Pilot" sponsored by the Aircraft Owners and Pilots Association (AOPA), the "Learn to Fly" campaign sponsored by the National Air Transportation Association (NATA), and "GA Team 2000", which is sponsored by more than 100 industry organizations. The "No Plane, No Gain" campaign is a program promoting the cost effectiveness of using general aviation aircraft for business and corporate uses. "Project Pilot" and "Learn to Fly" are programs promoting training of new pilots.

The general aviation industry is also launching new programs to make aircraft ownership easier and more affordable. The New Piper Aircraft company has created Piper Financial Services (PFS) to offer competitive interest rates and/or leasing of Piper aircraft. The Experimental Aircraft Association offers financing for kit built airplanes through a private lending institution.

Instrument operations at towered airports and general aviation aircraft handled at en route traffic control centers increased 4.8 percent and 1.9 percent, respectively, in 1999. Instrument operations have increased five of the past six years, with activity gains totaling 17.4 percent over the period. The number of general aviation aircraft handled at en route traffic control centers increased for the eighth consecutive year in 1999. These increases accompany the expanding fleet of sophisticated turboprop and turbojet aircraft in the general aviation fleet and the expansion in use of these aircraft for business/corporate uses.

The most notable trend in general aviation is the continued strong use of general aviation aircraft for business and corporate uses. For 1998 (the most current year of data), business and corporate use of general aviation aircraft represented 23.9 percent of general aviation activity. These uses accounted for 21.2 percent of general aviation activity in 1997.

The most striking industry trend is the continued growth in fractional ownership programs. Fractional ownership programs allow businesses and individuals to purchase an interest in an aircraft and pay for only the time that they use the aircraft. This has allowed many businesses and individuals, who might not otherwise, to own and use general aviation aircraft for business and corporate uses.

The five major companies in this industry are Executive Jets' Netjets, Bombardier's Flexjet, Raytheon's Travel Air, Flight Options and TAB Aviation. Between 1993 and 1998, these companies expanded their fleet and shareholders by 65.2 percent and 66.1 percent, respectively. In 1999, the fractional jet fleet totaled 329 and shareholders totaled 1,567. Since 1993, Executive Jet has ordered 368 new aircraft and is purportedly the single largest nonmilitary purchaser of aircraft.

Exhibit 2A depicts the FAA forecast for active general aviation aircraft in the United States. The FAA forecasts general aviation active aircraft to increase at an average annual rate of 0.9 percent over the 13 year planning period. General aviation aircraft are projected to increase from 204,710 in 1998 to 230,995 in 2011.

Turbine-powered aircraft are projected to grow faster than all other segments of the national fleet and grow at 3.2 percent annually through the year 2011. Turbojet aircraft are projected to provide the largest portion of this growth and grow at 4.9 percent annually. Turboprop aircraft are projected to grow at 1.2 percent annually, The strong growth projected for the turbojet aircraft is the result of the strong U.S. and worldwide economy, growth in the fractional ownership industry, new product offerings (which include both new entry level aircraft and long range global jets) and a shift from commercial air travel to corporate/business air travel by many business travelers and corporations.

Although the general aviation active fleet is projected to increase at less than one percent annually, general aviation hours flown are forecast to increase by 1.7 percent annually over the twelve year planning period. The total pilot population is projected to grow at 2.1 percent annually through the planning period.

GENERAL AVIATION SERVICE AREA

The initial step in determining the general aviation demand for an airport is to define its generalized service area for the various segments of aviation the airport can accommodate. The airport service area is determined primarily by evaluating the location of competing airports, their capabilities and services, and their relative attraction and convenience. It should be recognized that aviation demand does not necessarily conform to political or geographical boundaries.

The airport service area is an area where there is a potential market for airport services. Access to general aviation airports, commercial air service, and transportation networks enter into the equation that determines the size of a service area, as well the quality of aviation facilities, distance, and other subjective criteria.

As in any business enterprise, the more attractive the facility is in services and capabilities, the more competitive it will be in the market. As the level of attractiveness expands, so will the service area. If an airport's attractiveness increases in relation to nearby airports, so will the size of the service area. If facilities are adequate and rates and fees are competitive at Bishop Airport, some level of general aviation activity might be attracted to the airport from surrounding areas.

The determination of future based aircraft demand for Bishop Airport begins with a review of the local based aircraft service area. The local airport service area is defined by the proximity of other airports and the facilities that they are able to provide to general aviation aircraft.

For Bishop Airport, the local service area can be expected to include Mammoth-Yosemite, Independence, Lone Pine, Dyer and Lee Vinning Airports. None of these airports currently provide commercial service. All of these fields are well suited to accommodate most general aviation traffic. Bishop (and to some degree Mammoth) is better suited to accommodate larger corporate aircraft due to airfield length and strength. Bishop also has ample room to provide additional facilities as demand dictates.

The Independence, Dyer, and Lee Vinning Airports have no general aviation services available. While Lone Pine does offer a variety of services, its remote location will prevent most owners from basing their aircraft there. Most aircraft owners prefer to base their aircraft in close proximity to their residence. Therefore, the primary service area is most likely defined to the Bishop/Mammoth area, while the limits of the service area include more outlying areas in Inyo and Mono counties.

BASED AIRCRAFT FORECASTS

The number of based aircraft is the most basic indicator of general aviation demand. By first developing a forecast of based aircraft, the growth of the other indicators can be projected based upon this growth and other factors characteristic to Bishop Airport and the area it serves.

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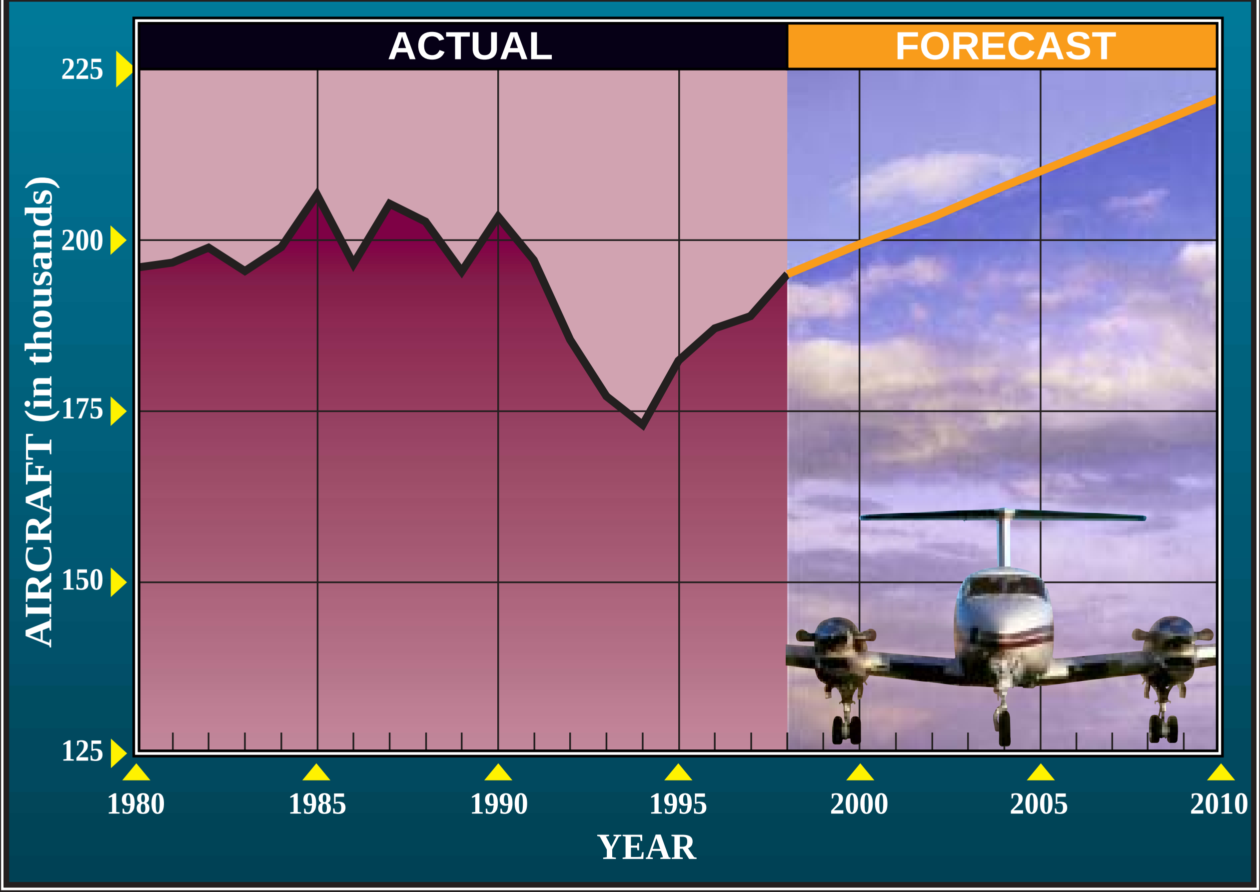
U.S. ACTIVE GENERAL AVIATION AIRCRAFT



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

As of Dec. 31, 1998	FIXED WING								
	PISTON		TURBINE		ROTORCRAFT				
	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 Aeronautical 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.

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

One forecast method utilized is to compare the airport's based aircraft to resident population. **Table 2G** presents historical and forecast based aircraft per 1,000 Inyo County residents.

TABLE 2G
Bishop Airport Based Aircraft vs. Inyo County Population Projections

Year	Inyo Population	Inyo County Registered Aircraft	Aircraft per 1,000 People	Bishop Airport Based Aircraft	% of Inyo Registered
1996	18,340	70	3.81	n.a.	
1997	18,290	68	3.71	n.a.	
1998	18,120	75	4.13	n.a.	
1999	18,200	84	4.61	n.a.	
2000	18,250	74	4.05	75	101%
Constant Share Projection					
2005	18,500	74	4.00	75	100%
2010	18,810	75	4.00	75	100%
2020	19,630	78	4.00	78	100%
Increasing Share Projection					
2005	18,500	83	4.50	83	100%
2010	18,810	94	5.00	94	100%
2020	19,630	118	6.00	118	100%

n.a. - not available

As indicated in the table, Inyo County registered aircraft per 1,000 Inyo residents has fluctuated between a low of 3.71 in 1997 and a high of 4.61 in 1999.

Two forecasts were produced using the ratio of aircraft per 1,000 residents. First, a constant share forecast considered that the aircraft registered in Inyo County per 1,000 Inyo residents will remain at 4.0. This would likely occur if aviation growth slows to simply match population growth of the area. This projection yields 78 based aircraft at Bishop by 2020, an increase of only 3.

Based aircraft totals at Bishop can generally be expected to increase as long as positive socioeconomic conditions exist in the area. With the expanding tourism industry, growing population base, and economic growth in the area, the potential exists for based aircraft growth at the airport to exceed the County's expected population growth rate. The increasing market share projection reflects a continued resurgence of general aviation coupled with a strong economy and the lack of comparable facilities in the region. The increasing share projection, reaching 6.0 aircraft per 1,000 Inyo residents by 2020 would result in an increase of 44 based aircraft over the planning period reaching 118 based aircraft.

A summary of historical and forecast based aircraft is illustrated on **Exhibit 2B**. The increasing market share projection appears to be the most reasonable for the purposes of this Master Plan. This projection is somewhat optimistic, but it allows for consideration of limited facilities at surrounding airports and the growth in popularity of the Mammoth Area as a vacation destination. In order to develop a plan which will allow the County to develop facilities based upon demand, the following planning horizon activity milestones have been established for based aircraft:

- Short Term - 83
- Intermediate Term - 94
- Long Term - 118

State and Federal forecasts project slightly lower numbers for Bishop Based aircraft over the next twenty years. The higher numbers here can be justified by the growing local tourism market and by comparing trends from other airports of similar size.

Based Aircraft Fleet Mix Projection

Knowing the aircraft fleet mix expected to utilize the airport is necessary to properly plan facilities that will best serve the level of activity and the type of activities occurring at the airport. The existing-based aircraft fleet mix is comprised of single and multi-engine piston-powered aircraft and also includes gliders.

As detailed previously, the national trend is toward a larger percentage of sophisticated turboprop, jet aircraft, and helicopters in the national fleet. Growth within each based aircraft category at the airport has been determined by comparison with national projections (which reflect current aircraft production) and consideration of local economic conditions.

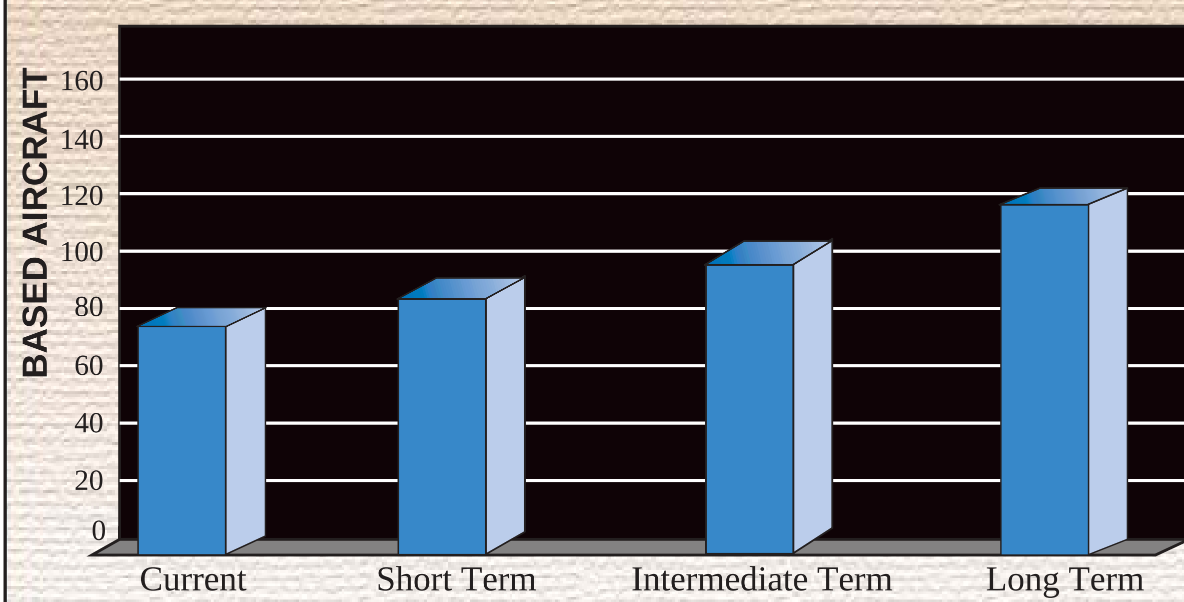
The projected trend of based aircraft at Bishop includes a growing number of single and multi-engine aircraft and turboprop aircraft. The based aircraft fleet mix projection for Bishop Airport is summarized in **Table 2H**.

ANNUAL OPERATIONS

There are two types of operations at an airport: local and itinerant. A local operation is a takeoff 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 used primarily to carry people from one location to another.

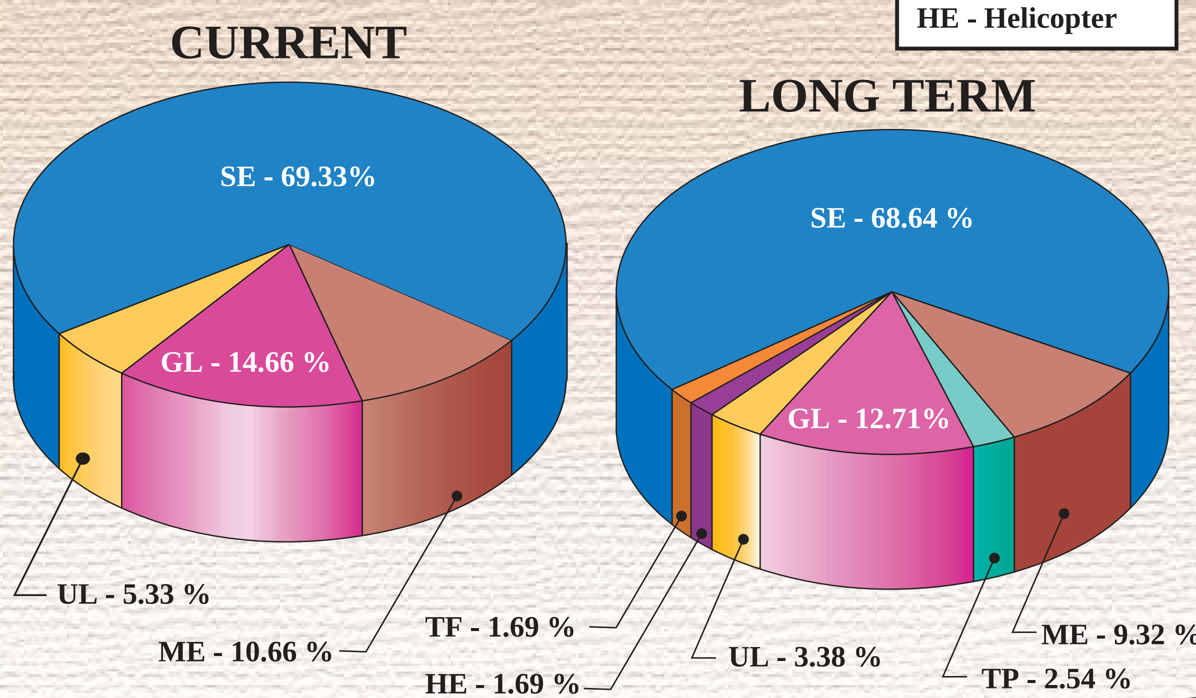
Due to the absence of an airport traffic control tower, actual operational counts are not available for Bishop Airport. Instead, only general estimates of aircraft operations based on observations are made periodically. Estimates of historical aircraft operations for the airport are recorded

BASED AIRCRAFT



SE - Single Engine
ME - Multi-Engine
TP - Turboprop
GL - Gliders
UL - Ultralight
TF - Turbofan
HE - Helicopter

PERCENT BY AIRCRAFT TYPE



Source: Coffman Associates Analysis.

Exhibit 2B
BASED AIRCRAFT AND
FLEET MIX FORECAST

by the FAA on the 5010-1, Airport Master Record Form. Operational estimates have been provided by airport management for the FAA in the past. Airport management utilizes aircraft service and fuel tickets to estimate annual operations.

TABLE 2H
Fleet Mix Forecast
Bishop Airport

	EXISTING		FORECAST					
Type	**2000**	**%**	**Short Term**	**%**	**Inter. Term**	**%**	**Long Term**	**%**
Single Engine	52	69.33%	57	68.67%	64	68.08%	81	68.64%
Multi-Engine	8	10.66%	8	9.63%	10	10.63%	11	9.32%
Turboprop	0	0%	1	1.20%	2	2.12%	3	2.54%
Gliders	11	14.66%	12	14.45%	12	12.76%	15	12.71%
Ultralight	4	5.33%	4	4.81%	4	4.25%	4	3.38%
Turbofan	0	0%	0	0%	1	1.06%	2	1.69%
Helicopter	0	0%	1	1.20%	1	1.06%	2	1.69%
Totals	75	100%	83	100%	94	100%	118	100%

As shown in **Table 2J**, general aviation operations are estimated to total approximately 30,000. Of this total, approximately 25,000 are estimated as itinerant and approximately 5,000, or 20%, as local operations.

Projections of annual operations have been developed by examining the number of operations per based aircraft. Typically, at airports similar to Bishop Airport, 400 operations per based aircraft may be expected. Airports with higher training operations (local operations) will have a higher "operation per based aircraft ratio", whereas airports with a higher percentage of transient aircraft operations will have a lower ratio.

Using 400 operations per based aircraft provides us annual growth of 2.2 percent. The FAA projects general aviation activity to increase at an average annual rate of 1.7 percent per year over the next 12 years. The forecast of based aircraft yields 47,200 annual general aviation operations by 2020.

The FAA projects an increase in aircraft utilization and the number of general aviation hours flown. This projected trend supports future growth in annual operations at Bishop Airport.

MILITARY ACTIVITY

Projecting future military utilization at the airport is particularly difficult since local missions may change with little notice. However, existing operations and aircraft mix may be confirmed for their impact on facility planning. As indicated by the FAA TAF document, historical military operations have accounted for 3,000 itinerant operations annually. Military operations consist primarily of helicopter activity at Bishop Airport.

TABLE 2J Operations per Based Aircraft Projections Bishop Airport					
Year	Itinerant	Local	Total	Based Aircraft	Operations per Based Aircraft
2000	25,000	5,000	30,000	75	400
Annual Operations Projections					
Short Term	27,700	5,500	33,200	83	400
Intermediate	31,600	6,000	37,600	94	400
Long Term	40,700	6,500	47,200	118	400

Currently, there is no reason to believe the current military operational levels will change significantly in the future.

FOREST SERVICE ACTIVITY

Projecting Forest Service utilization at Bishop Airport is difficult as local usage depends heavily on fire suppression activity. Usage can vary from a few operations annually to several hundred.

PEAKING CHARACTERISTICS

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

- **Peak Month** - The calendar month when peak passenger enplanements or aircraft operations occur.
- **Design Day** - The average day in the peak month. This indicator is easily derived by dividing the peak month operations or passenger enplanements by the number of days in the month.
- **Busy Day** - The busy day of a typical week in the peak month.
- **Design Hour** - The peak hour within the design day.

Without an airport traffic control tower, adequate operational information is not available to directly determine peak general aviation operational activity at the airport. Therefore, peak period forecasts have been determined according to trends experienced at similar airports.

Typically, the peak month for activity at general aviation airports approximates 10 to 15 percent of the airport's annual operations. For planning purposes, peak month operations have been estimated as 13 percent of annual operations. Based on peaking characteristics from similar airports, the typical busy day was determined by multiplying the design day by twenty percent of weekly operations during the peak month, or 1.4. Design hour operations were determined using 20 percent of the design day operations. The general aviation peaking characteristics are summarized in **Table 2K**.

TABLE 2K
Peak Operations Forecasts
Bishop Airport

	2000	Short Term	Intermediate	Long Term
Annual Operations	30,000	33,200	37,600	47,200
Peak Month	3,900	4,316	4,888	6,136
Busy Day	182	200	228	285
Design Day	130	143	163	204
Design Hour	26	28	32	40

SUMMARY

This chapter has outlined the various aviation demand levels anticipated for the next 20 years at Bishop Airport. Long term growth at the airport will be influenced by many factors including the local economy, the need for a viable aviation facility in the immediate area and trends in general aviation at the national level.

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 and/or landside facilities which will create a more functional aviation facility. A summary of the forecasts is presented in **Exhibit 2C**.

99MP09-2C-10/30/00

FORECAST SUMMARY

		Forecasts		
CATEGORY	**Current**	**Short Term**	**Intermediate Term**	**Long Term**
Annual Operations				
Local	5,000	5,500	6,000	6,500
Itinerant	25,000	27,700	31,600	40,700
Total	***30,000***	***33,200***	***37,600***	***47,200***
Annual Enplanements (potential)	**0**	**10,515**	**12,727**	**17,610**
Based Aircraft	**75**	**83**	**94**	**118**

Exhibit 2C
FORECAST SUMMARY

Chapter Three

AIRPORT FACILITY REQUIREMENTS

Airport Facility Requirements

An updated set of planning horizon milestones of aviation demand for Bishop Airport (BIH) were established in the previous chapter. These activity milestones include passenger enplanements, aircraft operations, based aircraft, fleet mix, and peaking characteristics. With this information, specific components of the airfield and landside system can be evaluated to determine their capability to accommodate future demand.

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

As indicated earlier, airport facilities include both airfield and landside components. Airfield facilities include those facilities that are related to the arrival, departure, and ground movement of aircraft. The components include:

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

Landside facilities are needed for the interface between air and ground transportation modes such as:

- General Aviation Terminal
- Aircraft Hangars

- Aircraft Parking Aprons
- Auto Parking and Access
- Airport Support Facilities

AIRFIELD REQUIREMENTS

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

AIRFIELD CAPACITY

A demand/capacity analysis measures the capacity of the airfield facilities (i.e. runways and taxiways) in order to identify a plan for additional development needs. The capacity of the airfield is affected by several factors including airfield layout, meteorological conditions, aircraft mix, runway use, aircraft arrivals, and exit taxiway locations. 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.

Pursuant to FAA guidelines detailed in the FAA Advisory Circular 150/5060-5, *Airport Capacity and Delay*, the annual service volume of an intersecting runway configuration normally exceeds 230,000 operations. Since the forecasts for the airport indicate that the activity throughout the planning period will remain well below 230,000 annual operations, the capacity of the existing airfield system will not be reached, and the airfield is expected to meet operational demands.

RUNWAY ORIENTATION

The airport is served by three runways. Primary Runway 12-30 is oriented in a northwest-southeast direction while Runway 16-34 is oriented in a north-south direction, and Runway 7-25 is oriented in an east-west direction. For the operational safety and efficiency of an airport, it is desirable for the primary 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 specify that additional runway configurations are needed when the primary runway configuration provides less than 95 percent wind coverage at specific crosswind components. The 95 percent wind coverage is computed on the basis of crosswinds not exceeding 10.5 knots for small aircraft weighing less than 12,500 pounds and from 13 to 20 knots for aircraft weighing over 12,500 pounds.

Weather data, provided by the National Oceanic & Atmospheric Administration (NOAA), and collected over the past 10 years at Bishop Airport, was used to determine wind coverage for the airport. This weather data is shown in **Table 3A**.

TABLE 3A
Weather Observations for Bishop Airport

Runway	10.5 knots	13 knots	16 knots	20 knots
12-30	94.48%	97.49%	99.17%	99.79%
16-34	96.94%	98.50%	99.49%	99.85%
7-25	83.45%	88.80%	94.90%	98.31%
Combined	99.85%	99.96%	99.99%	100.00%

SOURCE: National Oceanic & Atmospheric Administration (NOAA).
Observation Dates: 1/1/90 to 12/31/99
51,261 observations

Crosswind runways are required when wind coverage is less than 95%. Crosswind runways are beneficial when the primary runway must be closed for construction or maintenance. This holds especially true for airports which provide commercial services. Thus, the existing runway orientation will provide adequate wind coverage.

PHYSICAL PLANNING CRITERIA

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 to prevent the location of new facilities in a location that would conflict with future uses of the airport. Relocation of these facilities would likely be extremely expensive at a later date.

The most important characteristics in airfield planning are the approach speed and wingspan of the critical design aircraft anticipated to use the airport now or in the future. The critical design aircraft is defined as the most demanding category of aircraft which conducts 500 or more operations per year at the airport.

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, referred to as 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 (ADG) and relates to aircraft wingspan (physical characteristic). Generally, aircraft approach speed applies to runways and runway-related facilities, while airplane 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 airfield 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 Bishop Airport.

Bishop Airport is currently used by a wide variety of general aviation aircraft, including: small single engine aircraft, multi-engine aircraft, small and medium sized helicopters, gliders, general aviation business aircraft, a limited number of military aircraft (mostly helicopters), and Forest Service aircraft, including C-130's.

Commercial Aircraft

As previously indicated, the airport is not currently served by commercial carriers. In the past, a wide variety of piston and turboprop aircraft were utilized by the airlines including the 44-seat Convair 580, the 19-seat DHC-6, and the Piper Navajo.

Considering the future potential for commercial service, it is likely that if service is re-established at Bishop, small to medium sized aircraft would be used. The aviation demand forecasts noted that the regional carriers are shifting their fleet mixes to include primarily regional jet aircraft. This could potentially include the Canadair CRJ 200 (ARC C-II), or the Embraer ERJ 135/145 (ARC C-II). It is also possible that the airport may be designated as an alternate airport for air carriers; however, the annual operations would not affect the critical airport designation. For future planning purposes, consideration will be given to both the CRJ 200 and the ERJ 135/145 models as the critical aircraft for commercial service. As an alternate airport, consideration should be given to serving the Boeing 757.

General Aviation

General aviation aircraft using the airport include small single and multi-engine aircraft (which fall within approach categories A and B and ADG I) and business turboprop and jet aircraft (which fall within approach categories B, and C and ADGs I and II).

The most demanding based aircraft is currently a Cessna Caravan (B-II). The airport is also currently utilized by transient military and Forest Service aircraft ranging from the T-34 to the C-130. However, flights made by the Forest Service and miliary are not of sufficient numbers for these aircraft to be considered as critical aircraft.

Critical Design Aircraft Conclusion

Current based aircraft that fall within ARC B-II are estimated to conduct more than 500 operations annually. Based upon the higher approach speeds of common regional jets and business jets, an increasing percentage of jets will fall within C-II. Therefore, ultimate planning should consider ARC C-II as the critical aircraft to properly plan for the full range of regional and business jets under 60,000 pounds.

Although Runway 12-30 is the primary runway for Bishop Airport, wind analysis indicates that it does not provide adequate wind coverage for all crosswind components. For this reason, Runway 16-34 should be maintained to accommodate the majority of traffic. As previously stated, crosswind runways also provide a vital purpose in providing an alternate landing area when the primary runway is closed for any reason. It would not be necessary for Runway 16-34 to meet ARC C-II standards if the majority of C-II operations take place on Runway 12-30.

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 II design requirements to accommodate the potential use of the airport by commuter airlines. Transient general aviation apron and aircraft maintenance and repair hangar areas should consider ADG II requirements to accommodate typical business and regional jet aircraft. T-hangar and small conventional hangar areas should consider ADG I requirements as these commonly serve smaller single and multi-engine piston aircraft.

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.

For calculating runway length requirements at Bishop, the airport elevation is 4,118 feet above mean sea level (MSL) and the mean maximum temperature of the hottest month is 76.7 degrees Fahrenheit (July). For Runway 12-30, the primary runway, the overall difference in runway end elevations is 22 feet.

Using the specific data for Bishop Airport described above, runway length requirements for the various classifications of aircraft that may operate at the airport were examined using the FAA Airport Design computer program Version 4.2D which groups general aviation aircraft into several categories, reflecting the percentage of the fleet within each category and useful load (passengers and fuel) of the aircraft. **Table 3A** summarizes FAA recommended runway lengths for Bishop Airport.

TABLE 3A
Runway Length Requirements
Bishop Airport

AIRPORT AND RUNWAY DATA	
Airport elevation	4118 feet
Mean daily maximum temperature of the hottest month	97.2 F
Maximum difference in runway centerline elevation	22 feet
Length of haul for airplanes of more than 60,000 pounds	1,000 miles
Dry runways	
RUNWAY LENGTHS RECOMMENDED FOR AIRPORT DESIGN	
Small airplanes with less than 10 passenger seats	
75 percent of these small airplanes	4,160 feet
95 percent of these small airplanes	5,460 feet
100 percent of these small airplanes	5,780 feet
Small airplanes with 10 or more passengers seats	5,780 feet
Large airplanes of 60,000 pounds or less	
75 percent of business jets at 60 percent useful load	6,690 feet
75 percent of business jets at 90 percent useful load	8,820 feet
100 percent of business jets at 60 percent useful load	9,900 feet
100 percent of business jets at 90 percent useful load	11,220 feet

REFERENCE: FAA's airport design computer software, Version 4.2D

As mentioned previously, the current critical design aircraft for Runway 12-30 fall within ARC B/C-II. The appropriate FAA runway length planning category for aircraft within ARC C-II is "75 percent of large airplanes at 60 percent useful load". As shown in the table, the FAA recommends a runway length of 6,690 feet to serve this category of aircraft. At 7,500 feet long, Runway 12-30 meets this minimum length.

Analysis specific to individual business and regional jet aircraft has been completed to determine if the length of Runway 12-30 would be adequate for the range of jet aircraft that may operate at Bishop in the future. **Table 3B** presents this analysis. As indicated in the table, a range of runway lengths is required by business and regional jet aircraft. Runway 12-30 meets or exceeds the requirements for many of these aircraft.

TABLE 3B
Business/Regional Jet Runway Length Requirements

	Runway Length Required for (in feet)	
Aircraft Type	**Take-off @97 F**	**Landings on Dry Runway**
BAe 125-800	*7,800*	5,000
Canadair Challenger CL600	6,900	5,500
Cessna 550	5,500	2,900
Cessna 650	6,000	5,300
G-IV	7,000	5,400
Hawker 125-700/800	*8,000*	4,000
Hawker 1000	7,500	5,000
Israel Aircraft Industries		
- Astra SPX	7,000	5,000
- Westwind	7,300	3,500
Lear		
- 35	6,000	3,400
- 55	7,300	3,200

97.2 F is the Normal Daily Maximum temperature at Bishop Airport (July)

As an alternate facility, the adequacy of Runway12-30 was examined for B-757 aircraft. To provide for 1500 nautical mile stage lengths the runway should be at least 6,100 feet in length.

RUNWAY WIDTH

Runway width is based upon the planning ARC for each runway. For ARC C-II, the FAA specifies a runway width of 100 feet. The existing width of all runways at Bishop Airport, at 100 feet, meet FAA requirements.

RUNWAY PAVEMENT STRENGTH

The most important feature of airfield pavement is its ability to withstand repeated use by aircraft of significant weight. At Bishop airport, this includes a wide range of general aviation aircraft ranging from small single-engine aircraft to business jet aircraft.

Runway 12-30 presently has a single wheel loading (SWL) strength of 70,000 pounds, 110,000 pounds dual wheel loading (DWL), and 200,000 pounds dual tandem wheel (DTWL). Runway 16-34 has a pavement strength rating of 100,000 pounds SWL, 140,000 pounds DWL and 240,000 DTWL. Runway 7-25 has a pavement strength rating of 40,000 SWL, 56,000 DWL, and 98,000 DTWL.

These pavement strengths ratings are sufficient to serve the expected mix of aircraft to use the airport through the planning period

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, parallel taxiway access is provided on Runways 12-30 and 16-34. Taxiway A extends from the main apron to the both ends of Runway 12-30. Taxiway H extends from the north end of Runway 16-34 south intersecting Runway 12-30 and on to the south end of Runway 16-34. Additional taxiways are located around the field providing good access to all parts of the Airport.

Taxiway width is determined by the ADG of the most demanding aircraft to use the taxiway. The most demanding aircraft expected during the planning period fall within ADG C-II. FAA design standards specify a minimum taxiway width for ADG C-II is 35 feet. Taxiways at Bishop are all 50 feet wide. Therefore, all taxiways meet or exceed the minimum design requirement.

Design standards for the separation distances between runways and parallel taxiways are based primarily on the ARC for that particular runway and the type of instrument approach capability. ARC C-II design standards specify a runway/taxiway separation distance of 300 feet. Presently, all taxiways at Bishop Airport are more than 300 feet from Runway centerline to taxiway centerline, meeting the minimum runway/taxiway separation criterion.

Holding aprons provide an area for aircraft to prepare for departure off the taxiway and allow aircraft to bypass other aircraft which are ready for departure. Currently Runway 16-34 and Runway 12-30 have holding aprons at both ends of the runways. These aprons improve efficiency during departures for all aircraft using the airport.

NAVIGATIONAL AIDS AND INSTRUMENT APPROACH PROCEDURES

Two electronic navigational aids are in place to assist pilots in locating and landing at Bishop Airport. The Bishop VOR/DME and global positioning system (GPS) navigational aids assist pilots landing at the airport during poor weather conditions when following instrument approach procedures established by the FAA. These aids provide two circling instrument approaches that can be used on any runway.

The advent of global positioning system (GPS) technology can ultimately provide the airport with the capability of establishing new 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, 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 en route 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 (ILS).

GPS approaches fit into three categories, each based upon the desired visibility minimum of the approach. The three categories of GPS approaches are: precision, approach procedure with vertical guidance and non-precision. 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 FAA has recently issued revised standards (Change 6) which address Precision, Approach Procedure with Vertical Guidance (APV), and Nonprecision Approach requirements (attached as Appendix C). It is anticipated that Runway 12-30 will receive consideration for improved minimums using GPS.

AIRFIELD SAFETY STANDARDS

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

The OFA is defined as "a two dimensional ground area surrounding runways, taxiways, and taxilanes which is clear of objects except for objects whose location is fixed by function." The runway safety area (RSA) is defined as "A defined surface surrounding the runway prepared or suitable for reducing the risk of damage to airplanes in the event of an undershoot, overshoot, or excursion from the runway." The OFZ is defined as a “defined volume of airspace centered above the runway centerline whose elevation is the same as the nearest point on the runway centerline and extends 200 feet beyond each runway end.”

The FAA has issued Change 6 to FAA AC 150/5300-13, *Airport Design*, to address new requirements for the transition to global positioning system (GPS) navigation. Change 6 has identified a new area, the precision object free area (POFA) for all runways having or expected to have precision approaches. Consideration will be given to protecting the POFA at each end of Runway 12-30.

The FAA expects these areas to be under the control of the airport and free from obstructions.

A review of aerial photography and the current Airport Layout Plan (ALP) reveals that all runways comply with RSA, OFA and OFZ standards for B-II. The critical design aircraft identified for the planning period will require a C-II designation. None of the runways currently meet C-II requirements for the RSA or the OFA. All three runways do meet C-II requirements for the OFZ. The next chapter, Airport Development Alternatives, will examine RSA, OFA and OFZ standards considering each potential runway extension alternative.

LIGHTING AND MARKING

Currently, there are a number of lighting and pavement markings aids serving pilots and aircraft using Bishop. 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 150/5340-1H, *Standards for Airport Markings*, provides the guidance necessary to design an airport's markings. Runways 16-34, 12-30, and 7-25 are equipped with non-precision runway markings. These non-precision markings will be sufficient through the planning period unless a precision approach with less than 3/4-mile visibility minimums is approved.

Taxiway and apron areas also require marking to assure that aircraft remain on the pavement. Yellow centerline stripes are currently painted on all taxiways except Taxiways C, D, and E. These taxiway and apron surface lines provide this guidance to pilots. Consideration should be given to adding taxiway markings to Taxiways C, D, and E. Besides routine maintenance, these markings will be sufficient through the planning period.

The airport is equipped with a rotating beacon to assist pilots in locating the airport at night. The existing rotating beacon is adequate and should be maintained in the future.

Runway lighting systems provide critical guidance to pilots during nighttime and low visibility operations. Runways 12-30 and 16-34 are equipped with high intensity runway lighting

(HIRL). Runway 7-25 is equipped with medium intensity runway lighting (MIRL). These systems are sufficient for the existing GPS approaches and should be maintained through the planning period. Runway End Identifier Lights (REIL) should be added to both ends of Runways 12-30 and 16-34.

Effective ground movement of aircraft at night is enhanced by the availability of taxiway lighting. All taxiways are equipped with taxiway lighting. These lighting systems are sufficient and should be maintained through the planning period.

Lighted directional signs are installed at the airport. This signage identifies runways, taxiways, and apron areas. These aid pilots in determining their position on the airport and provide directions to their desired location on the airport. These lighting aids are sufficient and should be maintained through the planning period.

Bishop Airport is equipped with pilot controlled lighting (PCL). PCL allows pilots to control the intensity of runway and taxiway lighting using the radio transmitter in the aircraft. PCL also provides for more efficient use of runway and taxiway lighting energy use. This functionality should be maintained through the planning period.

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 are commonly provided at airports. Presently, a visual approach slope indicator (VASI-4) is available at both ends of Runway 12-30 and Runway 16-34. These lighting aids are sufficient and should be maintained in the future. However, the FAA is recommending that the VASI systems eventually be replaced with Precision Approach Path Indicators (PAPI).

HELIPAD

There are 5 helipads located at the Bishop airport. Proper markings should be maintained through the planning period.

OTHER FACILITIES

The airport has a segmented circle and lighted wind cone which provides pilots with information about wind conditions and local traffic patterns. These facilities are required when an airport is not served by a 24-hour ATCT. These facilities are sufficient and should be maintained in the future.

An automated surface observation system (ASOS) is an important component to airfield operations as it notifies pilots of local weather conditions. This system should be maintained through the planning period and upgraded as needed. A summary of the airfield facility requirements is presented on **Exhibit 3A**.

LANDSIDE REQUIREMENTS

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

GENERAL AVIATION FACILITIES

Aircraft Storage Hangars

The demand for aircraft storage hangars typically depends upon the number and type of aircraft expected to be based at the airport. For planning purposes, it is necessary to estimate hangar requirements based upon forecast operational activity. However, hangar development should be based on actual demand trends and financial investment conditions.

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. This is evident at Bishop Airport as there is currently a waiting list of 35-40 aircraft for hangar space.

Future hangar requirements for the airport are summarized on **Exhibit 3B**. As indicated on the exhibit, additional hangars will be needed to accommodate projected based aircraft. A planning standard of 1,200 square feet for single-engine aircraft and 2,500 feet for multi-engine aircraft were used to determine aircraft storage hangar requirements. Total hangar area was increased 15 percent to account for future aircraft maintenance and repair needs.

Presently, aircraft storage and maintenance and repair needs are being met through the use of the large conventional hangar on the east side of the apron area. T-hangars are used for small single and multi-engine aircraft storage. In the future it is expected that the aircraft storage hangar requirements will continue to be met through a combination of hangar types. The alternatives analysis will examine the options available for hangar development at the airport and determine the best location for each type of hangar facility.

Aircraft Parking Apron

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. Approximately 50 tiedowns are available for transient and based aircraft at the airport. Although the majority of future based aircraft were assumed to be stored in an enclosed hangar, a number of based aircraft will still tiedown outside.

Total apron area requirements were determined by applying a planning criterion of 700 square yards per

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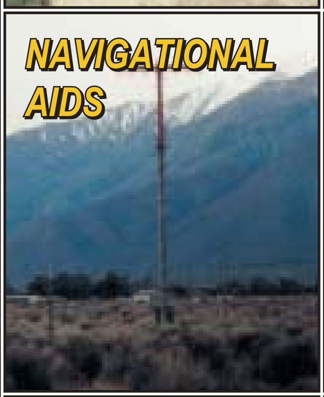
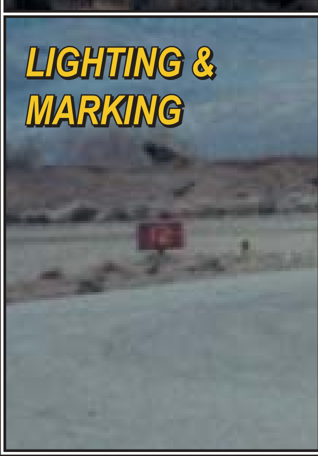
	AVAILABLE	SHORT-TERM	ULTIMATE
 RUNWAYS, TAXIWAYS, & HELIPAD	**Runway 12-30** 7,498' x 100' 70,000 lbs SW 110,000 lbs DW 200,000 lbs DTW Full Length Parallel Taxiway **Runway 16-34** 5,600' x 100' 100,000 lbs SW 140,000 lbs DW 240,000 lbs DTW Full Length Parallel Taxiway **Runway 7-25** 5,566' x 100' 40,000 lbs SW 56,000 lbs DW **Helipad** Three Pads	**Runway 12-30** Extend Safety Areas **Runway 16-34** Extend Safety Areas **Runway 7-25** Extend Safety Areas Relocate Taxiway **Helipad** Same	**Runway 12-30** Potential for widening to 150' and/or extension to 8,900' **Runway 16-34** Same **Runway 7-25** Extend Parallel Taxiway **Helipad** Same
 NAVIGATIONAL AIDS	• ASOS/AWOS • Bishop VOR/DME • VOR or GPS Circling Approaches • VASI - 4 (12, 30, 16, 34)	• Potential GPS Non-Precision or Instrument Procedure with Vertical Guidance • Transition VASI to PAPI	• Potential GPS Precision Approach
 LIGHTING & MARKING	• Rotating Beacon • Segmented Circle • Lighted Windcone • MIRL (7-25) • HIRL (12-30 & 16-34) • Taxiway Signage • Non-Precision Runway Markings	• Add REIL (12-30 & 16-34)	• Add MALSR to Runway 12 or 30 • Precision Runway Markings (12-30)

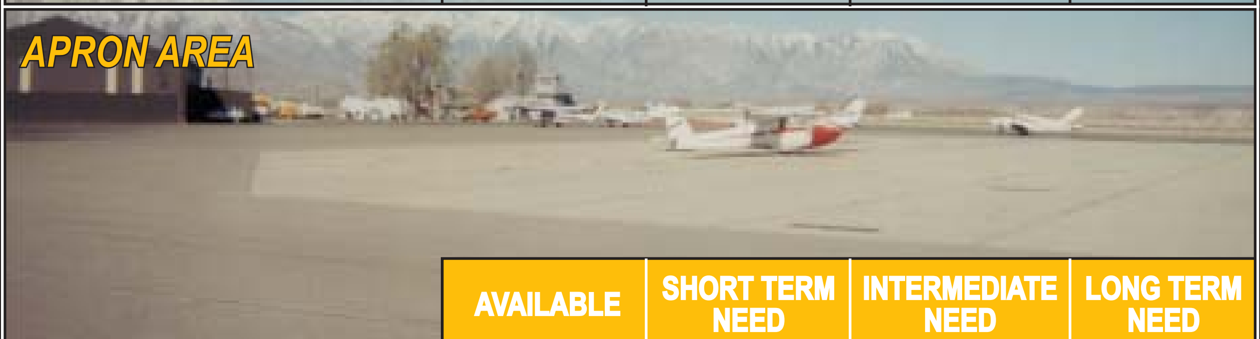
Exhibit 3A
AIRFIELD FACILITY REQUIREMENTS

99MP09-3B-10/20/00

AIRCRAFT STORAGE HANGARS

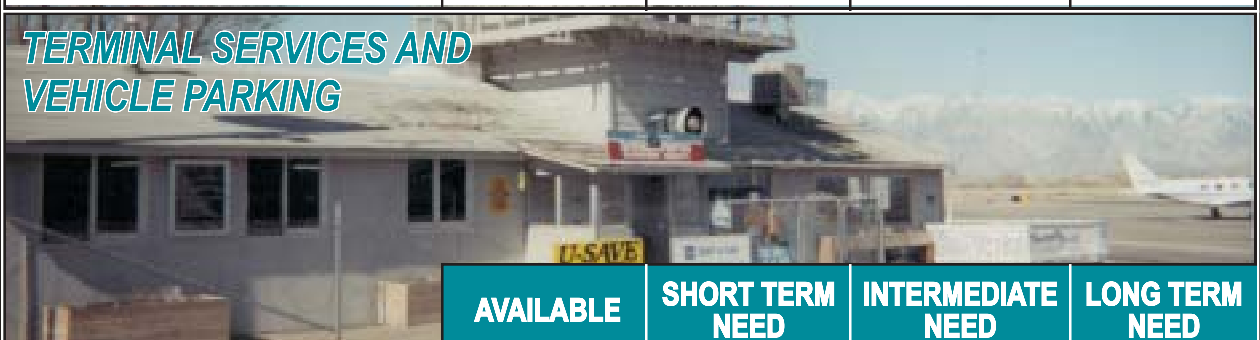
	AVAILABLE	SHORT TERM NEED	INTERMEDIATE NEED	LONG TERM NEED
T-hangar Positions	48	58	63	79
Conventional Hangar Positions	6	6	6	6
T-hangar Area (s.f.)	86,00	64,800	73,200	92,400
Conventional Hangar Area (s.f.)	15,000	15,000	15,000	15,000
Maintenance Area (s.f.)	5,000	12,000	13,200	16,100
Total Hangar Area (s.f.)	106,000	91,800	101,400	123,500

APRON AREA



	AVAILABLE	SHORT TERM NEED	INTERMEDIATE NEED	LONG TERM NEED
Transient Single, Multi-Engine Positions	10	8	11	17
Transient Business Jet Positions	2	1	1	2
Locally-Based Aircraft Positions	46	25	30	35
Total Positions	58	34	42	54
Total Apron Area (s.y.)	21,000	24,000	30,400	39,800

TERMINAL SERVICES AND VEHICLE PARKING



	AVAILABLE	SHORT TERM NEED	INTERMEDIATE NEED	LONG TERM NEED
Terminal Vehicle Spaces		52	62	86
General Aviation Spaces		41	47	59
Total Parking Spaces	50	93	109	145
Total Parking Area (s.f.)	15,000	37,300	43,800	57,900

transient aircraft parking position and 570 square yards for each locally-based aircraft parking position. Transient business jet positions were determined by applying a planning criterion of 1,600 square yards for each transient business jet positions. The results of this analysis are presented on **Exhibit 3B**.

Based upon the planning criteria above and assumed transient and based aircraft users, it appears that the existing apron area will meet future aviation demand projections.

GENERAL AVIATION TERMINAL FACILITIES

General aviation terminal building space is required for waiting passengers, a pilot's lounge and flight planning, concessions, management, storage, and various other needs. Presently, space is available in the general aviation terminal building to accommodate these needs. Future terminal requirements have been determined and are shown on **Exhibit 3B**.

It should be noted that the general aviation terminal facilities provided at Bishop will be the first thing a leisure or business traveler will see when arriving at the Airport. Consideration of a first class general aviation passenger transfer facility should always be weighed when the airport's role includes the accommodation of business travelers. According to the analysis presented on **Exhibit 3B**, the existing general aviation terminal building is undersized to meet existing demand. Future planning will consider the construction of a new terminal building. The new terminal will be approximately 100 feet by 40 feet in size with an area of 4,587 square feet. Included in the new building will be space for a restaurant/café, airport offices, pilot lounge, flight planning areas, and public space. The layout for the building is included as **Exhibit 3C**.

General aviation vehicular parking demands have also been determined for Bishop Airport. Space determinations were based on an evaluation of the existing airport use as well as industry standards. Terminal automobile parking spaces required to meet general aviation itinerant and FBO operator demands were calculated by multiplying design hour itinerant passengers by the industry standard of 1.9 in the short term, increasing to 2.5 for the ultimate term as airport operations increase.

The parking requirements of aircraft owners should also be considered. Although some owners prefer to park their vehicle in their hangar, safety can be compromised when automobile and aircraft movements are intermixed. For this reason, separate parking requirements which consider one half of based aircraft at the airport were applied to general aviation automobile parking space requirements. Parking requirements are summarized on **Exhibit 3B**.

SUPPORT FACILITIES

Aircraft Rescue And Firefighting

The ARFF building at Bishop Airport is located to the west of the general aviation terminal building and includes storage space for the ARFF equipment.

In order to support Part 139 certification (required for commercial service) the existing ARFF equipment would most likely need to be upgraded.

F.A.R. Part 139 "Certification and Operations: Land Airports Serving Certain Air Carriers", as amended, prescribes the rules governing the certification and operation of land airports which serve any scheduled or unscheduled passenger operations of an air carrier that is conducted with an aircraft having a seating capacity of more than 30 passengers.

The compliance level required is dependent on the airport's design standards and the size and frequency of the scheduled aircraft service (at least daily departures by the largest category of aircraft). The minimum level of ARFF response and equipment are listed as follows:

- One Vehicle carrying at least 500 lbs of sodium-based dry chemical or halon 1211 or 450 lbs of potassium-based dry chemical and water with a commensurate quantity of aqueous film forming foam (AFFF) to total 100 gallons, for simultaneous dry chemical and AFFF foam application.
- ARFF facilities must be in a location that allows a response within three (3) minutes from the time of the alarm, and at least one required ARFF vehicle shall reach the midpoint of the farthest runway serving air carrier aircraft and begin application of foam, dry chemical, or halon 1211.

Aviation Fuel Storage

Inyo County owns and operates two above-ground storage tanks, one for Jet-A, and one for 100LL Avgas storage. Fuel storage totals 24,000 gallons and includes 12,000 gallons for Jet-A fuel and 12,000 gallons for Avgas fuel in separate tanks. Mobile fuel delivery is also available for both Jet-A and 100LL. A 2,000 gallon fuel truck is used for Jet-A, and a 1,200 gallon fuel truck is used for the delivery of 100LL.

Fuel storage requirements are typically based upon maintaining a two week supply of fuel during an average month, however, more frequent deliveries can reduce the fuel storage capacity requirement.

Future fuel storage requirements for the airport based upon a two week supply during the peak month will likely exceed the existing storage capacities. It is anticipated that additional Jet-A fuel storage will be needed throughout the planning period. Avgas storage is anticipated to be adequate through the planning period. Facility planning will consider the installation of another 12,000 gallon

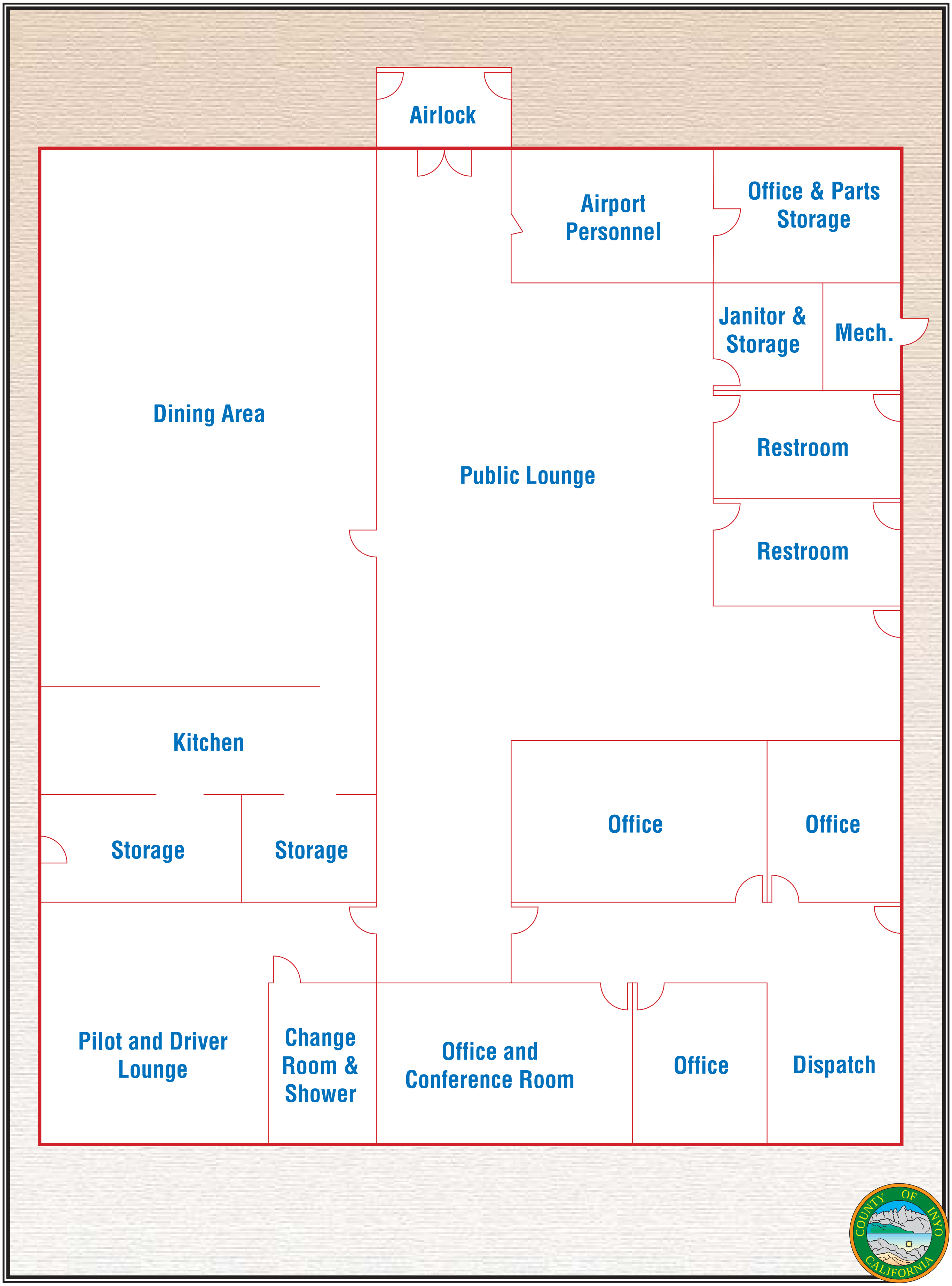


Exhibit 3C
NEW TERMINAL FLOOR PLAN

storage tank for Jet A fuel to meet future demand.

Aircraft Wash Facility

Presently, a number of airports are constructing or considering the development of an aircraft owner maintenance facility to meet tougher environmental requirements for hazardous material handling and disposal. These areas typically provide for the collection of used aircraft oil and other hazardous materials and provide a covered area for aircraft washing and light maintenance. The development of a similar facility at Bishop Airport could reduce environmental exposure and provide an additional revenue source which could be used to amortize development costs.

Fencing

The existing perimeter fencing will need to be re-evaluated after the new expanded runway safety areas have been considered.

SUMMARY

The intent of this chapter has been to outline the facilities required to meet potential aviation demands projected for Bishop Airport through the long term 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.

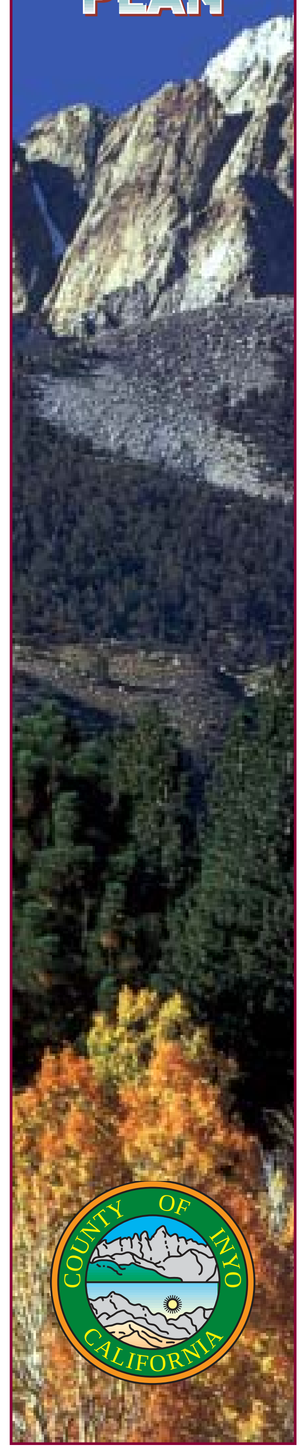
Chapter Four
DEVELOPMENT ALTERNATIVES

Development Alternatives

Analysis conducted in the previous chapters identified future potential aviation demand levels as well as the corresponding airside and landside facilities required to satisfy projected demand. Now that facility development schedules have been outlined, the next step in the planning process is to evaluate reasonable methods of providing the required facilities. This analysis will also consider if facility changes or improvements will be feasible or practical given development constraint issues.

It is important to remember that there are countless combinations of alternative development scenarios. The alternatives presented in this chapter, however, are those with the greatest potential for implementation. Also, in some cases, specific elements of one alternative canbeinterchangedwith another alternative. Thus, the final development concept will result from the input provided by Inyo County and other local/regional agencies in the review process. The final concept will be developed by the consultant and will be outlined in the next chapter.

The development alternatives for Bishop Airport can be categorized into two functional areas: The airside (airfield) and landside (airport terminal building, hangars, apron, and automobile parking). Within each of these areas, specific facilities are required or desired. In addition, the utilization of the remaining airport property (not needed in direct aviation-related activities) to provide revenue support for the airport and to benefit the economic development and well-being of Inyo County must be considered.



Each functional area interrelates and affects the development potential of the others. Therefore, all areas must be examined both individually, then coordinated as a whole, to ensure the final plan is functional, efficient, and cost effective. The total impact of all of these factors on the existing airport must be evaluated to determine if the investment in Bishop Airport will meet the needs of the citizens of the community during (and beyond) the 20-year planning period.

The alternatives considered are compared using economic and aviation factors to determine which of the alternatives will best fulfill the aviation needs of the community, as well as the region. With this information, as well as the input and direction from local government agencies and airport users, a final airport concept can evolve into a realistic development plan.

BACKGROUND

Every airport must maintain and improve its facilities to remain viable. Since the last master plan was completed in 1978 Bishop Airport has undergone several changes:

- Runway 7-25 was reduced from a width of 150 feet to 100 feet, matching Runways 16-34 and 12-30.

- The ramp area was enlarged both to the north and the south allowing for more aircraft parking and safer movement of aircraft.

- The U.S. Forest Service moved their operations from the south side of Runway 7-25 to the west side of the airfield allowing room for three new helipads and an overflow tie-down area.

- New fuel tanks were installed to the south of the terminal building. Along with these new tanks, a self serve fuel pump was installed allowing 24-hour fuel services.

- Runway 12-30 received an overlay upgrading its condition and preparing it for many years of future use.

These types of improvements maintain Bishop Airport as a viable facility for many general aviation users, and maintain its potential for commercial service. By continuing to plan for, and implement improvements, Bishop will continue to operate as an important aviation facility in the region.

DO-NOTHING ALTERNATIVE

The "do-nothing" alternative essentially considers keeping the airport in its present condition and not providing for any type of improvement to the existing facilities. The primary impact of this alternative would be the inability of the airport to satisfy the projected aviation demands of the airport service area.

Other unavoidable consequences of the "do nothing" alternative would involve the airport's inability to adequately serve business users. Corporate aviation plays a major role in the transportation of business leaders. Thus, an airport's facilities are often the first impression many corporate officials will have of the community. If the airport does not have the capability to meet hangar, apron, or airfield needs of the potential users, the area's capability to attract and maintain business that relies on air transportation will be diminished.

An overall impact of the alternative will be the inability to attract new users, especially those businesses and industries seeking location with adequate and convenient aviation facilities. Without regular maintenance and additional improvements, potential users and business for Inyo County and the City of Bishop could be lost. To propose no further development at the airport would be inconsistent with the community's economic development efforts to attract business and industry to the region. Therefore, the "do nothing" alternative is not considered prudent or feasible.

AIRPORT DEVELOPMENT OBJECTIVES

The previous chapter identified both the airside and landside facilities necessary through the planning period. The overall objective is to produce a balanced airside and landside complex to serve forecast aviation demands. However, before defining and evaluating specific alternatives, airport development should consider the following objectives:

- Develop an attractive, efficient, and safe aviation facility in accordance with the currently established FAA criteria.
- Encourage increased general aviation use of the airport by promoting increased business and corporate use of the airport.
- Provide sufficient airside and landside capacity to meet the long term aviation demand of the area.
- Examine the potential upgrade of the facility to meet FAR Part 139 standards (for commercial service).

The remainder of the chapter will describe various development alternatives for the airside and landside facilities. Within each of these areas, specific facilities are required or desired. Although each area is treated separately, planning must integrate the individual requirements so that they complement one another.

AIRSIDE DEVELOPMENT ALTERNATIVES

Airfield facilities are, by nature, the focal point of the airport complex. Because of their primary role and the fact that they physically dominate airport land use, 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, critical aircraft operations dictate the FAA design criteria (size and approach speed) 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 designed to meet airfield needs. There are no significant changes necessary on the airfield side.

Presently, all runways are 5,500 feet in length (or longer), have a width of 100 feet, and meet current Airport Reference Code (ARC) C-II guidelines for length and width. Unfortunately, for the approach ends of Runways 25 and 30, the Obstacle Free Zone (OFZ), the Object Free Area (OFA), and the Runway Safety Area (RSA) are inadequate for C-II designations. Based on forecasted usage of the airport, C-II design standards should apply to the ultimate design and operation of Bishop Airport (although not all of the runways need to meet this standard). Additionally, the existing and ultimate Runway Protection Zones (RPZs) fall outside of the existing airport lease lines for all runways. Ultimately, Runway 12-30 (which is considered the primary runway) should be upgraded to meet ARC C-II standards, while Runways 7-25 and 16-34 (which are considered secondary runways) should only need to meet ARC B-II standards.

Airports need to provide usability (based upon winds) 95 percent of the time. Since smaller aircraft can handle less crosswind, individual runways are examined for their usability in all-weather conditions at different crosswind components.

Based on the most current wind data available, from January 1, 1990 to December 31, 1999, the primary runway at Bishop, Runway 12-30, provides wind coverage of 94.48 percent at a crosswind component of 10.5 knots. Runway 16-34 provides 96.94 percent wind coverage at 10.5 knots. Runway 7-25 provides 83.45 percent wind coverage at 10.5 knots.

Safety areas surrounding each runway were examined for each of the three airside alternatives that were considered. Each safety area was analyzed to determine if its current size, and any future enlargements, fit within existing airport property lease lines.

Under all three airside alternatives, Runways 7-25 and 16-34 remain under ARC B-II standards.

Runways 16-34 and 7-25 currently meet B-II standards for runway length and width requirements. However, the safety areas (distance of RSA/OFA beyond the runway end) for both runways extend beyond the existing property lines.

To maintain B-II standards, additional land will need to be included within the leased area at the end of several runways to maintain the required RSA/OFA. In addition, a Precision Object Free Area (POFA) will need to be under airport control if a precision GPS approach were to be approved.

The category B-II RSA/OFA on the north and south ends of Runway 16-34 extends beyond the current airport property lease lines and beyond the property lease line on the east end of Runway 7-25.

AIRSIDE ALTERNATIVE A

Alternative A is similar to a "do-nothing" alternative. Under this alternative, all three runways would maintain under category B-II standards. Currently, length and width requirements are met by all runways. The only action which would need to be taken would be to include the safety areas described previously within the airport property lease lines.

Runway 12-30 also lacks adequate land at the southeast end to contain the required RSA/OFA and POFA (should the approach be upgraded to precision GPS).

The total land area which would need to be included within the airport's leased area totals 6.2 acres. This alternative is shown on **Exhibit 4A.**

AIRSIDE ALTERNATIVE B

As the aircraft mix using Bishop Airport continues to change, the number of critical aircraft operations in the C-II category are expected to result in consideration of the airport meeting C-II standards. C-II aircraft include many popular business jets and regional jets used by commercial airlines.

Alternative B recommends upgrading the primary runway, Runway 12-30, to C-II standards while leaving Runway 16-34 and Runway 7-25 at existing B-II standards. **Exhibit 4B** depicts this alternative.

To meet C-II standards for Runway 12-30, additional land would need to be included in the leased area at each end of the runway to include the larger RSA and OFA. In addition, the existing fencing would need to be relocated outside of these new safety areas.

The total additional leased land requirement for this alternative is 30.9 acres.

AIRSIDE ALTERNATIVE C

Alternative C is similar to Alternative B in that Runway 12-30 will be upgraded to C-II standards, while Runways 16-34 and Runway 7-25 will both maintain existing B-II standards.

However, this alternative includes a runway extension of 1,400 feet, for a total length of 8,900 feet, to allow for the use of larger regional and business jets and to accommodate larger commercial aircraft (such as a Boeing 757) on long haul flights.

The runway extension would be made to the northwest end of Runway 12-30. This extension would also push the RSA/OFA out farther, requiring additional leased land.

Airside Alternative C would require a total of 56.6 acres of land. The total cost of the runway and taxiway extension is estimated at approximately $1,550,000. This alternative is shown on **Exhibit 4C**.

LANDSIDE ALTERNATIVES

The primary landside functions to be accommodated at the airport include aircraft storage, maintenance hangars, aircraft parking apron, and airport-related businesses. The inter-relationship of these functions is important to defining a long range landside layout for the airport. To a certain extent, landside uses need to be grouped with similar uses or uses that are compatible. Other functions should be separated, or at least have well defined boundaries for reasons of safety, security, and efficient operation. Finally, each landside use must be planned in conjunction with the airfield, as well as ground access that is suitable to the function. Runway frontage should be reserved for uses with a high level of airfield interface. Other uses (with lower levels of aircraft movements or little need for runway exposure) can be planned in more isolated locations.

The facility requirements analysis for Bishop Airport determined the need for future aircraft parking apron expansion, additional T-hangars and conventional hangars, and the construction of a new terminal building. The following landside alternatives will consider alternative locations for future facilities.

LANDSIDE ALTERNATIVE A

Exhibit 4D depicts a layout for landside development at Bishop Airport. On the west side of the terminal, executive hangars are developed just to the west of the proposed ramp extension. Automobile access would be provided to these corporate hangars from the existing airport road. The apron would be expanded in the vicinity of the corporate hangar development so that aircraft could be parked outside and other aircraft could still taxi with sufficient clearance from parked aircraft. These new hangars and the ramp extension would be served by Taxiway B.

T-hangars would be developed southeast of the terminal building near the south end of Runway 16-34. Access to these new T-hangars would be provided from Taxiway H. The new hangars will be oriented perpendicular to the taxiway to provide better traffic flow.

The existing terminal building in this alternative would be removed and replaced with a new building. The new terminal building would be located farther back from Taxiway B than the existing terminal in the area now occupied by the car park lot. In addition to the removal of the terminal building, a small hangar and storage building will be removed. The removal of these three buildings will provide for a much larger apron area and move the building line back from the taxiway.

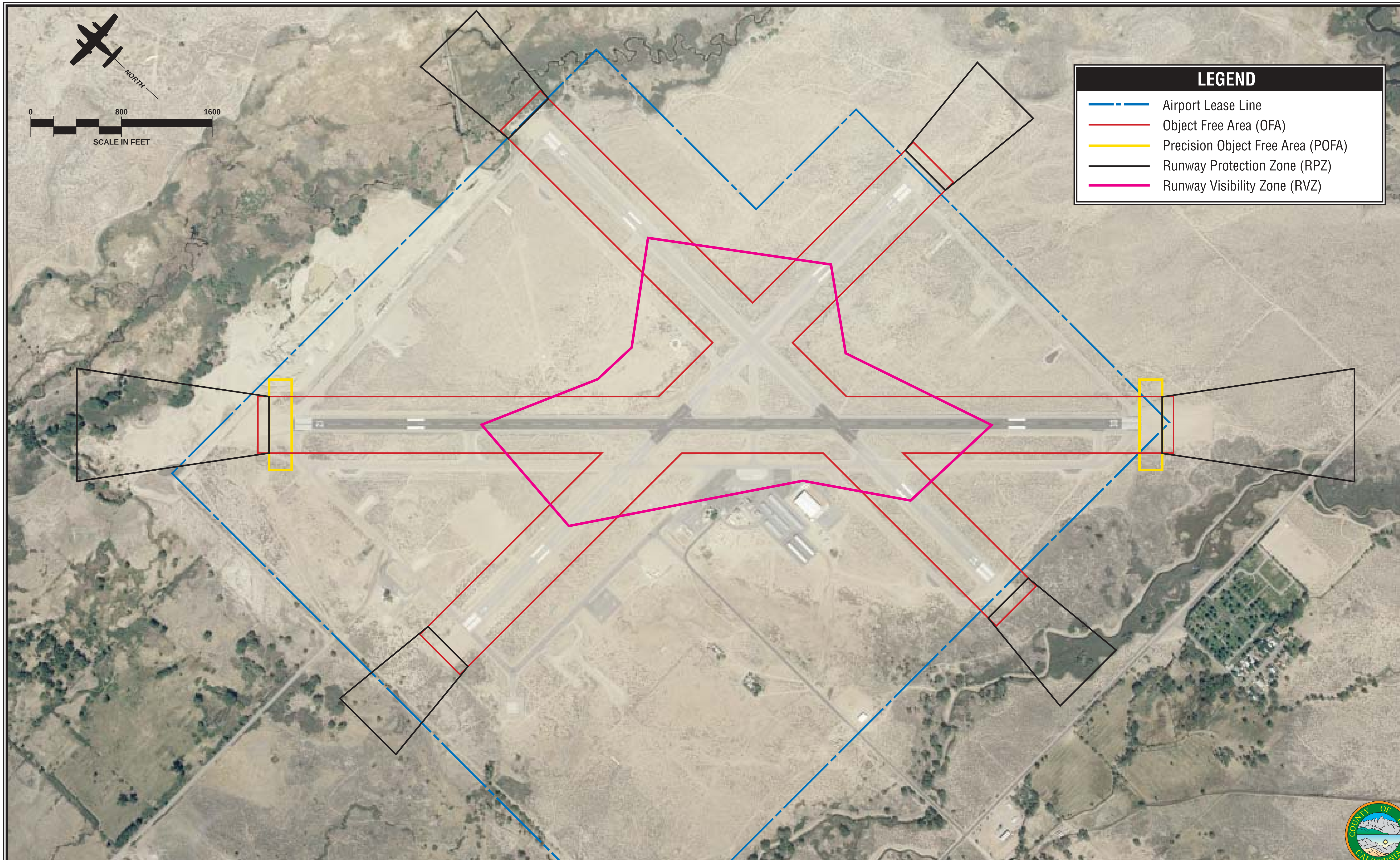


Exhibit 4A
AIRSIDE ALTERNATIVE A

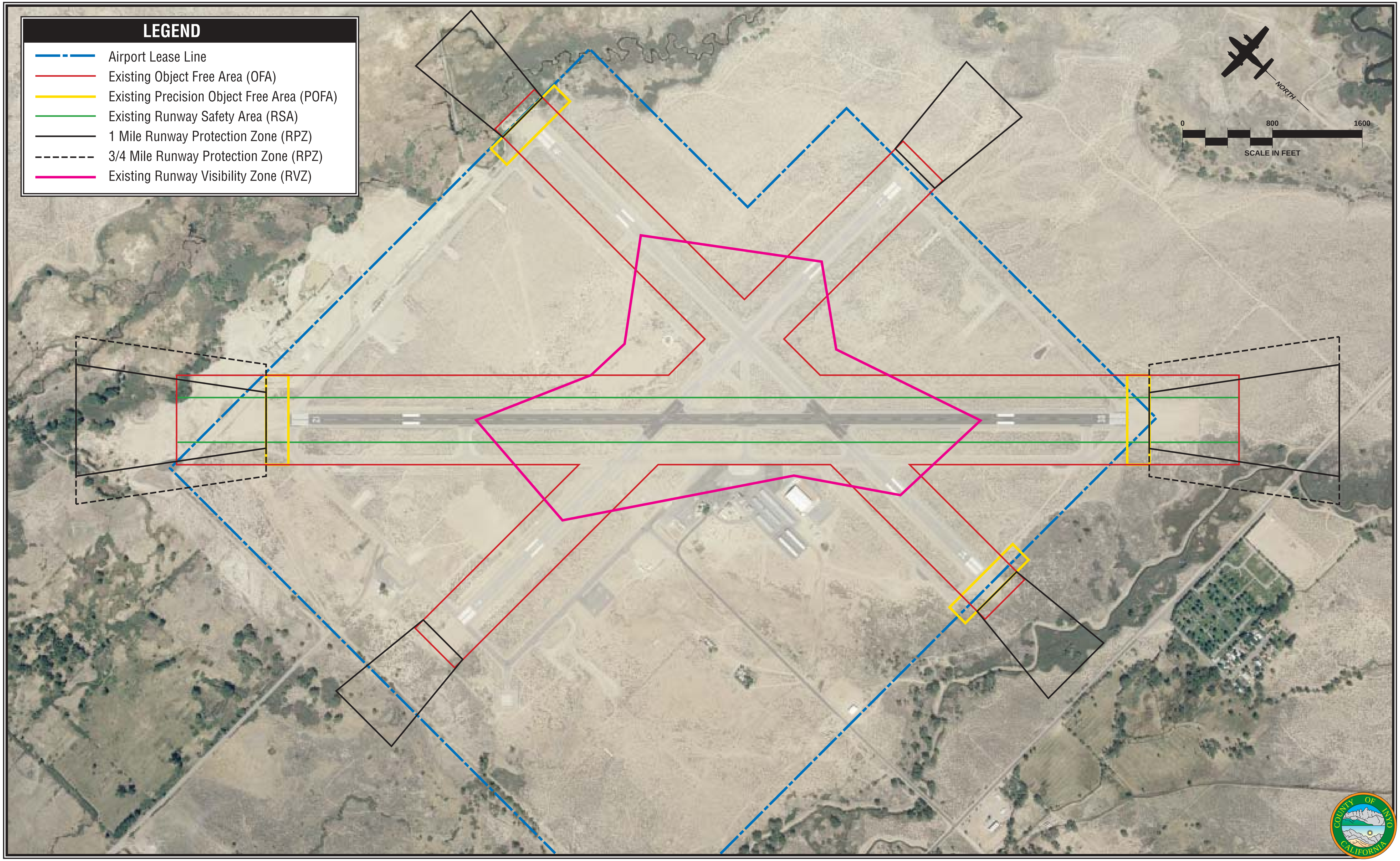


Exhibit 4B
AIRSIDE ALTERNATIVE B

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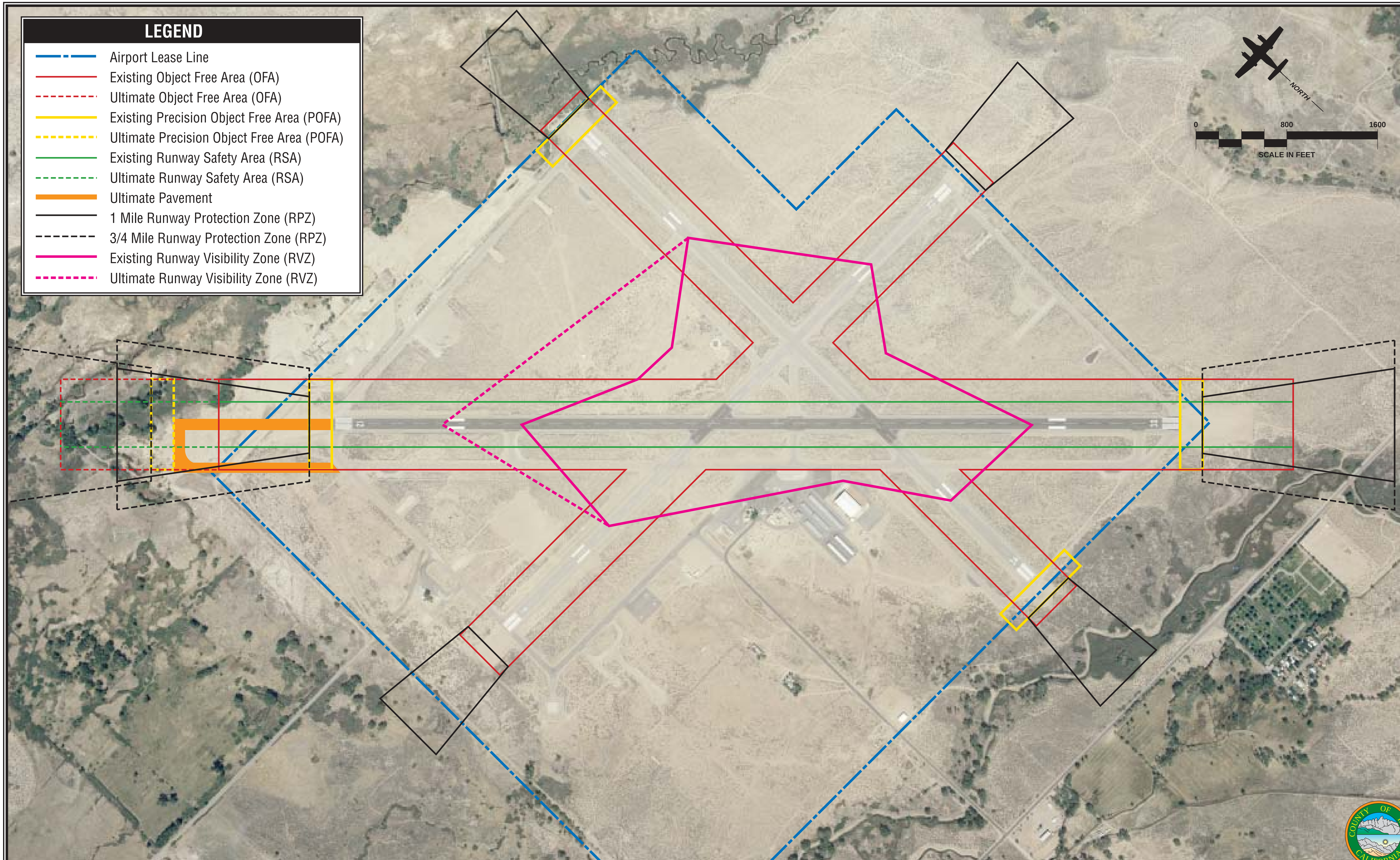

Exhibit 4C
AIRSIDE ALTERNATIVE C

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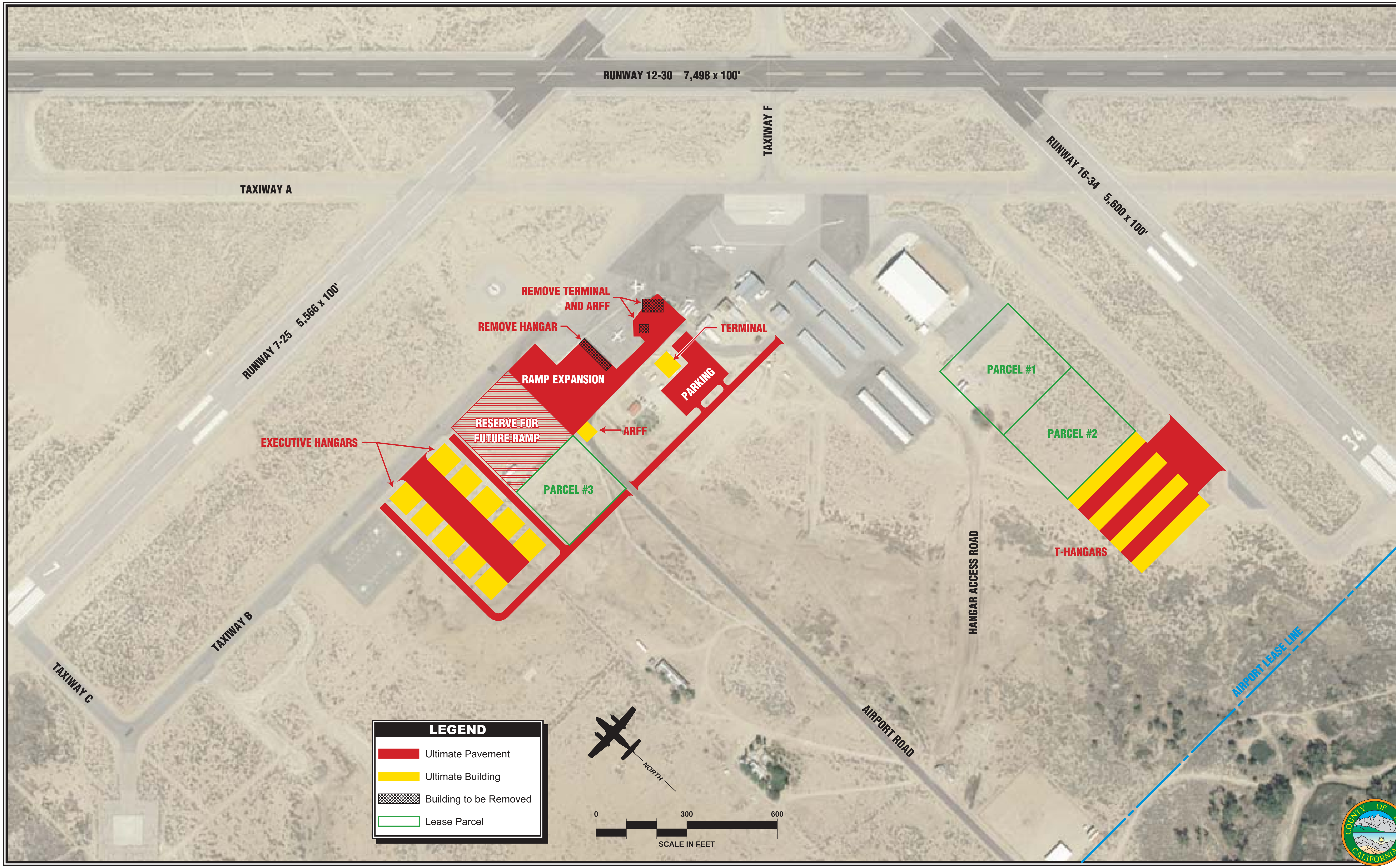

Exhibit 4D
LANDSIDE ALTERNATIVE A

Three parcels for development have also been identified to reserve this space for future use. Two large parcels are located south of Hangar A near the new T-Hangars. One smaller parcel is located behind the area reserved for future ramp expansion near the proposed executive hangars.

The total cost for ramp, taxiways, and roads under this alternative has been estimated at $736,600 and is depicted in **Exhibit 4D**.

LANDSIDE ALTERNATIVE B

In Alternative B, depicted in **Exhibit 4E**, the south side of the airport would be developed with T-Hangars at the south end of Runway 16-34. Several executive hangars would also be developed near Taxiway H, just south of Hangar A. These hangars would all have access to the airfield via Taxiway H.

Unlike Alternative A, the area to the west of Airport Road and the terminal building would be reserved for future development. The terminal building and automobile parking behind the terminal building would be relocated and expanded as indicated on **Exhibit 4E**.

This development alternative would provide for a large, uninterrupted ramp area, with room for expansion, along Taxiway B, providing a natural focal point for the airport. As with landside Alternative A, total costs do not include new buildings or removal of existing buildings. The estimated cost for ramp, taxiways, and roads is $767,700.

LANDSIDE ALTERNATIVE C

Alternative C, as depicted in **Exhibit 4F**, has been prepared to address increased commercial use of the airport and includes the addition of a new commercial passenger terminal, a new location for the general aviation terminal, a business park, and a runway extension.

The area reserved for the new commercial service passenger terminal is in the northwest corner of the airport property along Taxiway A. Entrance to the terminal area is shown from Wye Road on the west side of the airport property.

By providing access to the airport property from Wye Road, several things can be accomplished: Heavier traffic loads that will come with increased commercial service will be required to go through town to get to the airport; Wye Road and Airport Road can be connected near the existing general aviation terminal building allowing for better internal airport circulation; and commercial traffic (and possibly business park traffic) will be separated from general aviation traffic.

The new business park is located in the southwest corner of the airport property. The area is not currently utilized for aviation-related activities and could provide a source of additional income for Inyo County. In addition, the location provides an opportunity to link the airport to Wye Road, providing more efficient access to Highways 395/6.

Total cost for this alternative (exclusive of the new commercial terminal building) is estimated at $5,346,700.

LANDSIDE ALTERNATIVE D

Alternative D, as shown in **Exhibit 4G**, combines many of the ideas from the other alternatives, but allows for efficient development of landside facilities on the west side of the airfield.

However, to implement this alternative, it will require the partial closing of Runway 7-25. By closing the western half of this runway, land centrally located along the primary runway may be utilized for expansion of the general aviation area and development of a new commercial aviation terminal. The partial closing of Runway 7-25 would allow a runway of approximately 3,000 feet in length to remain, which would be adequate for most light general aviation aircraft. The alternative provides better expansion opportunities for both general aviation and commercial terminal facilities.

The estimated cost for this alternative is $6,010,000 (exclusive of the terminal).

F.A.R. PART 139 CERTIFICATION REQUIREMENTS

F.A.R. Part 139, "Certification and Operations: Land Airports Serving Certain Air Carriers", as amended, prescribes the rules governing the certification and operation of land airports which serve any scheduled or unscheduled passenger operations of an air carrier that is conducted with an aircraft having a seating capacity of more than 30 passengers. A Notice of Proposed Rulemaking issued by the Federal Aviation Administration on June 21, 2000 extends certification requirements to airports serving scheduled air carrier operations in aircraft with 10-30 seats. Bishop Airport currently does not hold a Part 139 certificate, therefore the following analysis was undertaken to determine the airport's requirements for certification. A full Part 139 certificate is required for scheduled operations by aircraft with greater than 30 seats. A limited Part 139 certificate is required for unscheduled charter operations using aircraft with a seating capacity of more than 30 passengers.

Under the proposed changes to the Part 139 requirements, there would no longer be "full" and "limited" certificates. These designations would be replaced by Classes I, II, III and IV. Airports serving all types of scheduled operations of large air carrier aircraft, and any other type of air carrier operations, would be known as Class I airports. Class II airports would be those airports that serve scheduled operations of small air carrier aircraft (10-30 seats) and unscheduled operations of larger air carrier aircraft (more than 30 seats). Class III airports would be those airports that serve only scheduled operations of air carrier aircraft with 10-30 seats. Class IV airports would be those airports serving only unscheduled air carrier operations in aircraft with more than 30 seats. These designations are shown in **Table 4A**.

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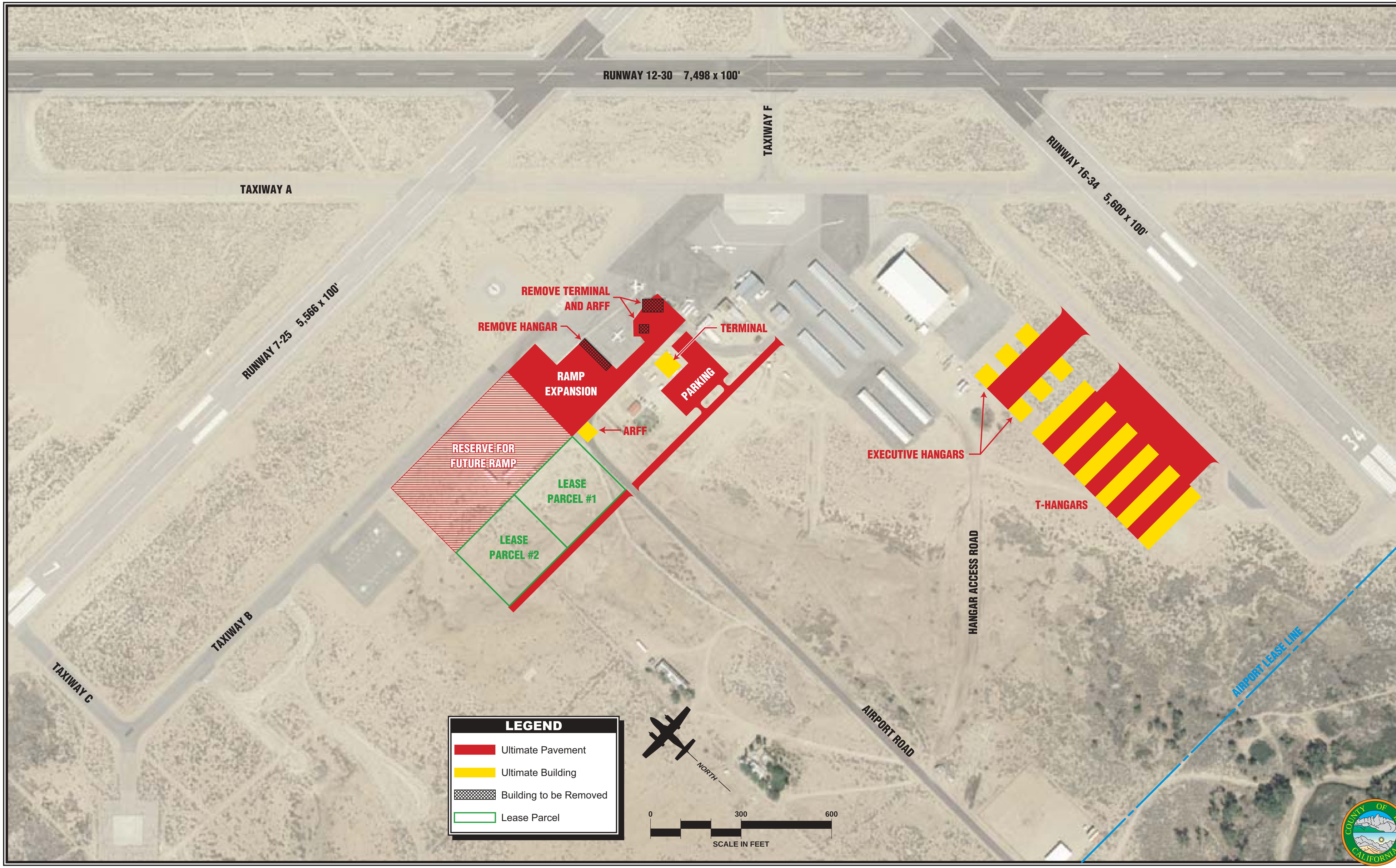

Exhibit 4E
LANDSIDE ALTERNATIVE B

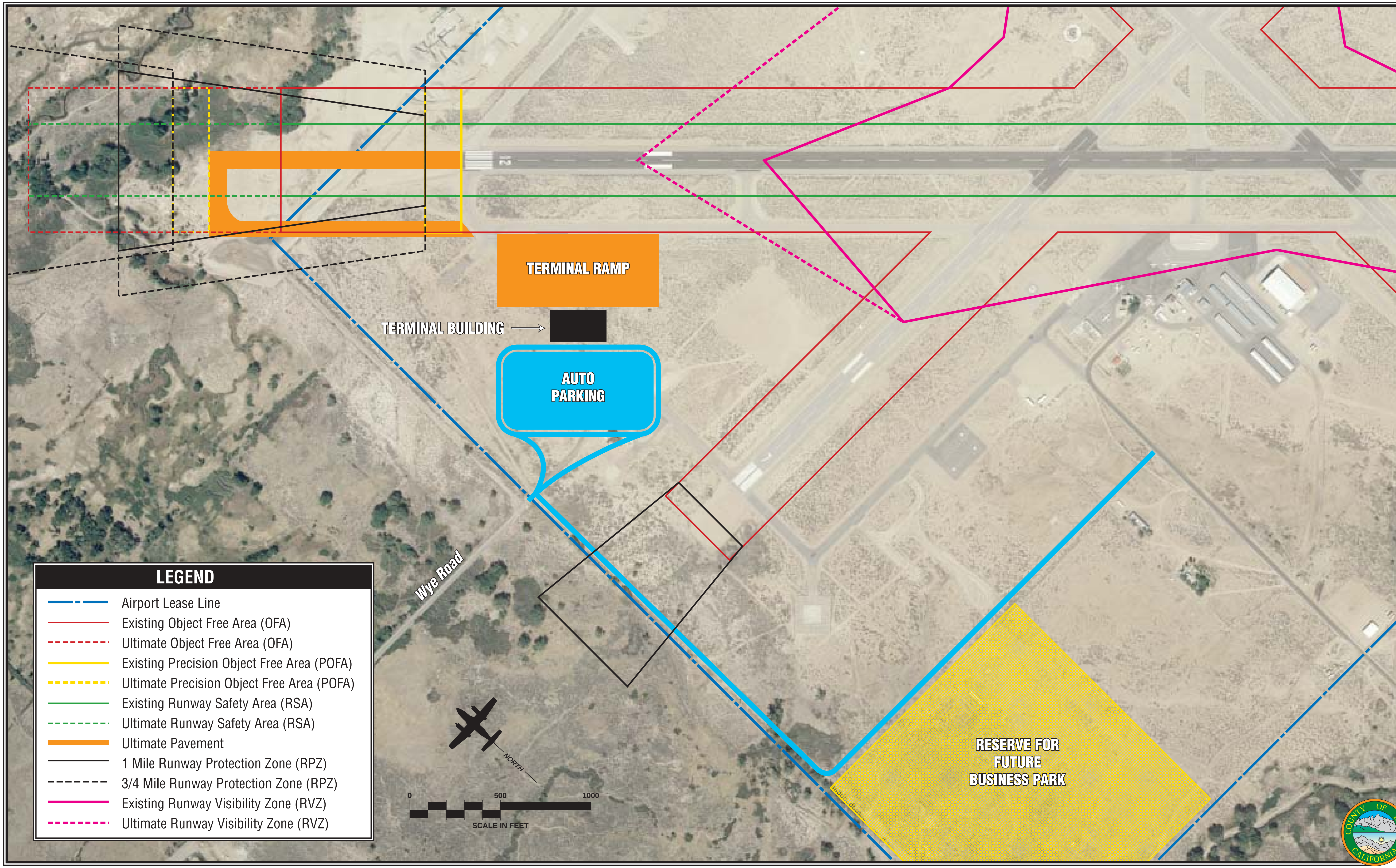

Exhibit 4F
LANDSIDE ALTERNATIVE C

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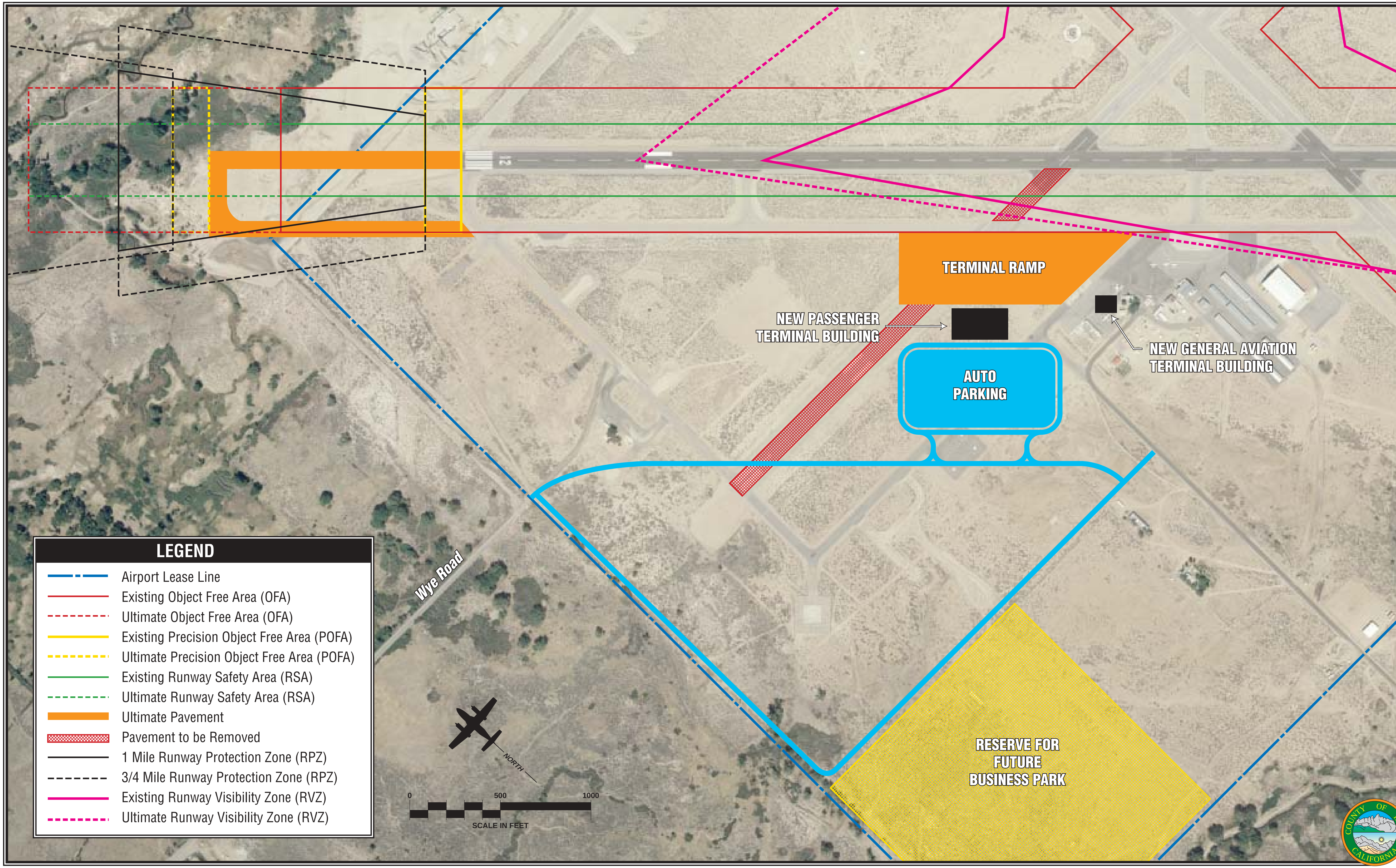


Exhibit 4G
LANDSIDE ALTERNATIVE D

TABLE 4A
Part 139 Airport Classifications

	Proposed Airport Class			
Type of air carrier operation	**Class I**	**Class II**	**Class III**	**Class IV**
Scheduled Large Air Carrier Aircraft	X			
Unscheduled Large Air Carrier Aircraft	X	X		X
Scheduled Small Air Carrier Aircraft	X	X	X	

Each of the FAR Part 139 checklist items are described and the required improvements associated with Bishop Airport are indicated in the following sections.

AIRPORT CERTIFICATION MANUAL REQUIREMENTS

Under FAR Part 139, a certificated airport must complete, and maintain, a certification manual which outlines their compliance under each provision of the regulations. The type of certification process that is required by Part 139 is determined by the type of airline service offered at the airport. If an airline is operating aircraft that seat more than 30 passengers, and offers scheduled service, the airport must maintain an Airport Certification Manual. If the airline is operating aircraft with more than 30 seats, but is only offering unscheduled service, the airport is only required to maintain Airport Certification Specifications. The Airport Certification Manual is required to give more detail and descriptions of the various items included in the FAR Part 139 requirements. The Airport Certification Specifications are only required to provide general descriptions of the Part 139 requirements. Under the new proposed rules, all Part 139 certificated airports will be required to maintain an Airport Certification Manual.

PERSONNEL

This section of FAR Part 139 states that the certificate holder shall maintain appropriate qualified personnel to comply with the requirements of the Airport Certification Manual/ Specifications. To comply with the requirements, at least one person would be needed to conduct a Part 139 self-inspection of the airport facilities on a daily basis to ensure compliance. This person must be trained in the identification of deficiencies and the reporting methods to report those deficiencies.

PAVED/UNPAVED AREAS

This section of the Part 139 requirements states that the certificate holder must maintain and promptly repair the pavement of each taxiway, runway, loading ramp, and parking area available for use by the air carrier.

At Bishop Airport, Runway 12-30 and Runway 16-34 and associated taxiways would be anticipated to be available for air carrier use, and would require compliance under FAR Part 139. Runway 12-30 and Runway 16-34 are in good condition and would, most likely, meet any pavement strength requirements. Pavement strengths of the associated taxiways and ramp areas are unknown at this time and may require strengthening in order to be used by larger air carrier aircraft.

SAFETY AREAS

Runways identified for air carrier use (Runway 12-30 and 16-34) would be required to maintain safety areas as defined in Part 139. Each safety area would require the clearing and grading of all potentially hazardous ruts, humps, depressions, or other surface variations in excess of three inches. These areas shall also be drained by grading or storm sewers to prevent water accumulation during rain storms or construction projects. All items located within these safety areas due to their function (runway lights, VASI's, etc) must be mounted on frangible structures with frangible point no higher than three inches above grade. Any items located within the safety areas at Bishop Airport would need to be installed on frangible supports and all safety areas should be cleared and graded of any of the previously mentioned deficiencies.

MARKING AND LIGHTING

All runways and taxiways associated with air carrier operations, as previously identified, would require markings associated with the lowest authorized approach minimums to the runway. Such markings include: taxiway centerline and edge markings; signs identifying the taxiing routes on the movement areas; and runway holding position markings and signage. Bishop Airport would be required to maintain the current non-precision markings on Runways 12-30 and 16-34 until a precision approach is approved for the airport, at which time the markings would need to be updated. Additional airport signage meeting Part 139 requirements may need to be installed as well.

SNOW AND ICE CONTROL

This section of Part 139 would most likely not affect Bishop Airport due to the small amount of annual snow and ice accumulation at the airport. However, if snow and ice conditions occurred at the airport after certification, all air carrier operations would be required to cease until the airport can comply with this section of Part 139. It is not anticipated that any additional equipment would need to be purchased to meet these requirements.

AIRCRAFT RESCUE AND FIREFIGHTING

The requirements for Aircraft Rescue and Firefighting (ARFF) equipment at an airport is determined by the length of the air carrier aircraft using the airport. The following indicates how to determine the ARFF Index and the associated equipment requirements.

Index A – Includes aircraft less than 90 feet in length.

Index B – Includes aircraft at least 90 feet but less than 126 feet in length (e.g. B737).

Index C – Includes aircraft at least 126 feet but less than 159 feet in length (e.g. B757).

Index D – Includes aircraft at least 159 feet but less than 200 feet in length (e.g. B767).

Index E – Includes aircraft at least 200 feet in length (e.g. B747).

To meet Index A requirements, the following equipment is required under Part 139: one vehicle carrying at least 500 pounds of sodium-based dry chemical, halon 1211, or 450 pounds of potassium-based dry chemical and water with a commensurate quantity of aqueous film forming foam (AFFF) to total 100 gallons, for simultaneous dry chemical and AFFF foam application.

To meet Index B requirements, at least one vehicle must be able to carry 500 pounds of sodium-based dry chemical or halon 1211, and 1,500 gallons of water, and the commensurate quantity of ARFF for foam production is required. If two ARFF vehicles are used, one must carry those agents listed for Index A requirements, and the other vehicle must carry an amount of water and the commensurate quantity of ARFF so that the total quantity of water for foam production carried by both vehicles is at least 1,500 gallons.

To meet Index C requirements, either two or three vehicles may be used. If three vehicles are used, one vehicle must meet those requirements for Index A, and the other two vehicles must carry an amount of water and the commensurate quantity of ARFF so that the total quantity of water for foam production carried by all three vehicles is at least 3,000 gallons. If two vehicles are used, one must carry meet the requirements previously listed for Index B, and the other vehicle must carry an amount of water and the commensurate quantity of ARFF so that the total quantity of water for foam production carried by both vehicles is at least 3,000 gallons.

To meet Index D requirements, three ARFF vehicles are required by Part 139. One vehicle must meet the requirements listed for Index A, and the other two vehicles must carry an amount of water and the commensurate quantity of ARFF so that the total quantity of water for foam production carried by all three vehicles is at least 4,000 gallons.

To meet Index E requirements, three ARFF vehicles are required by Part 139. One vehicle must meet the requirements listed for Index A, and the other two vehicles must carry an amount of water and the commensurate quantity of ARFF so that the total quantity of water for foam production carried by all three vehicles is at least 6,000 gallons.

Currently, Bishop Airport is not required to maintain an ARFF facility. To meet current Part 139 standards, ARFF vehicles would need to be acquired with trained ARFF personnel. These facilities need to be in a location that allows for a response within three minutes from the time of the alarm. In addition, at least one required ARFF vehicle must be able to reach the midpoint of the farthest runway serving air carrier aircraft and begin application of foam, dry chemical, or halon 1211 within three minutes. As Bishop Airport does not currently have the required dedicated ARFF facilities or equipment, they would need to be acquired for dedicated use at the airport.

HAZARDOUS MATERIALS

FAR Part 139 requires that each certificate holder that serves as a cargo handling agent shall establish and maintain procedures for the protection of persons and property on the airport during the handling and storing of any material regulation by the Hazardous Materials Regulations (49 CFR Part 171), that is, or intended to be, transported by air. In addition standards must be established and maintained for the protection against fire and explosions in storing, dispensing, and otherwise handling fuels, lubricants, and oxygen on the airport. These standards must cover facilities, procedures, and the training of staff. As aircraft fuel, lubricants, and oxygen are all stored and sold at Bishop Airport, this section would be required under Part 139. In addition to the development of rules and regulations regarding the handling and storage of these materials, the airport operator would be required to perform quarterly inspections of firms and individuals handling, storing, and disbursing these materials. Inspections records must be maintained for a minimum of twelve months.

TRAFFIC/WIND INDICATORS

Any airport certificated under Part 139 is required to maintain a wind cone that provides surface wind direction information visually to pilots. If the airport is open to air carrier operations at night, the wind direction indicators must be lighted. Airports serving air carrier operations when there is no air traffic control tower operating requires the installation of a segmented circle around one wind cone and a landing strip and traffic pattern indicator for each runway with a right-hand traffic pattern. Bishop Airport currently has a segmented circle and a lighted windcone.

AIRPORT EMERGENCY PLAN

A comprehensive emergency plan must be designed to minimize the possibility and extent of damage and personal injury on the airport in various emergency situations. Bishop Airport, in coordination with medical support facilities, would be required to maintain an airport emergency plan. This would require the airport and supporting medical facilities to review the plan once every twelve months and perform a full-scale airport emergency exercise at least once every three years.

SELF-INSPECTION PROGRAM

Bishop Airport would be required to inspect the airport facilities to assure compliance with Part 139 regulations. These inspections would be required on a daily basis. An additional inspection would be required after an unusual weather condition, and immediately following any incident or accident. This inspection information shall be maintained for a period of at least six months and made available to the FAA upon request.

GROUND VEHICLES

Bishop Airport will be required to limit the access of ground vehicles in movement areas to those vehicles necessary for airport operations. This would require that all personnel operating ground vehicles on the movement and safety areas to be trained in the proper operation and safety procedures on the airport. Any incident or accident involving an airport ground vehicle shall be documented and made available to the FAA upon request.

OBSTRUCTIONS

Each object in each area within the authority of the airport which exceeds any of the heights, or penetrates the imaginary surfaces described in FAR Part 77, must be removed, marked, or lighted. The necessary requirement shall be determined by an approved FAA Aeronautical study.

PROTECTION OF NAVAIDS

Any construction of facilities on the airport that, as determined by the FAA administrator, would degrade the operation of an electronic or visual navaid and air traffic control facilities must be prevented by the certificate holder. The certificate holder shall also assist in protecting all navaids against vandalism and theft, and to protect against the interruption of the visual or electronic signals of the associated navaid. Bishop Airport currently is equipped with a VOR/DME, ASOS, and AWOS at the airport. In addition, visual approach aids (VASIs) should be periodically inspected to assure no degradation in service.

PUBLIC PROTECTION

The certificated airport shall prevent inadvertent entry to the movement area by unauthorized persons or vehicles, and maintain reasonable protection of person and property from aircraft propwash or jet blast. This would involve the addition of an airport security fence and jet blast fences at Bishop Airport where necessary.

WILDLIFE HAZARD MANAGEMENT

The certificated airport shall provide an ecological study to the FAA Administrator when any incident or accident occurs on or near the airport involving birds or other wildlife. This study will examine the event, the species and numbers involved, location of incident/accident, and a description of the wildlife hazard to air carrier operations. If a wildlife hazard management plan is determined to be necessary, according to the FAA Administrator, a plan shall be submitted to the FAA Administrator for approval prior to the implementation. This plan will designate those personnel responsible for its implementation and the action to be taken. If any incidents or accidents occur involving birds or other wildlife at Bishop Airport, the airport could be required to implement a wildlife hazard management plan.

AIRPORT CONDITION REPORTING

The holder of a Part 139 certificate is responsible for the collection and reporting of the airport's condition to those air carriers serving the airport. The airport shall use the Notice to Airmen (NOTAM) system to report any deficiencies in airport conditions which may affect the safe operations of air carrier activity at the airport. In addition, any construction activity at, or around, Bishop Airport should also be reported through the NOTAM system.

IDENTIFYING, MARKING, AND REPORTING CONSTRUCTION

Any construction areas on or near any movement areas shall be properly marked or lighted to prevent any unsafe operations around these areas. These areas should be inspected as part of the daily self-inspection process, and at the end of each day's construction activities. All construction activities should be noted in the daily inspection, and a NOTAM issued to inform users of the airport of the current conditions.

NONCOMPLYING CONDITIONS

If the airport can not maintain compliance with FAR Part 139 requirements, the air carrier operations should be limited to those portions of the airfield not affected by the noncompliance. If the noncompliance involves a reduction in the ARFF Index, the airport shall limit the air carrier operations to those meeting the new, lower, ARFF Index.

SUMMARY

The process utilized in assessing the landside and airside development alternatives involved a detailed analysis of short and long term requirements as well as future growth potential. Current airport design standards were considered at every stage of development. The development plan for the airport must represent a means by which the airport can grow in a balanced manner to accommodate forecast demand for both the airside and landside areas. In addition, it must provide for flexibility in the plan to meet activity growth beyond the 20-year planning period.

Obviously, if Bishop Airport pursues certification under Part 139, a number of capital projects and on-going personnel expenditures will need to be considered in the financial program. In addition, revisions in the existing lease with the Los Angeles Water Department may need to be taken into consideration.

After a review of the alternatives, a development concept will be selected and proposed. The remaining chapters will be dedicated to refining the basic concept into a final plan with recommendations to ensure proper implementation and timing of the demand-based program.

Chapter Five
AIRPORT PLANS

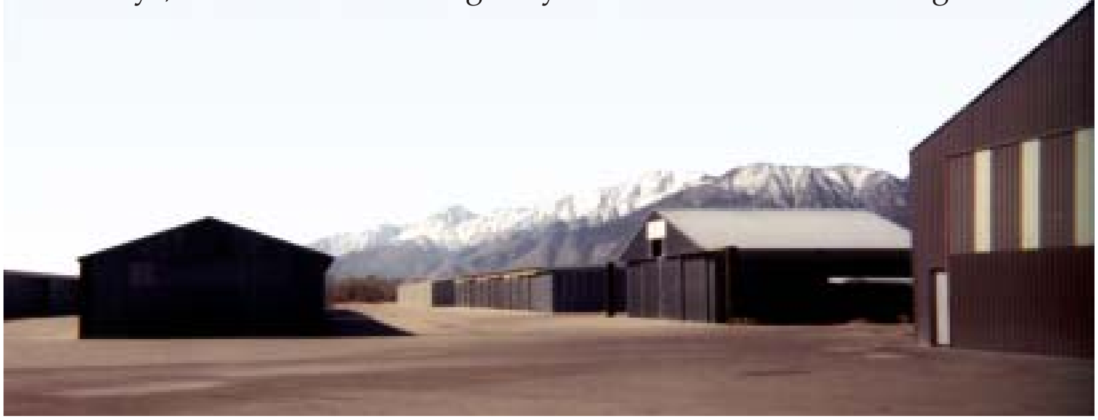
Airport Plans

The airport master planning process has evolved through several analytic efforts in the previous chapters. These efforts were intended to analyze future aviation demand, establish airside and landside needs, and evaluate options for the future development of the airport and its facilities. In the previous chapter, several development alternatives were analyzed to explore different options for the future growth and development of Bishop Airport. The development alternatives were refined into a single recommended concept for the master plan after meeting with the Planning Advisory Committee (PAC) in late February 2001.

In June 2001, a modification of the concept was decided upon by the PAC members and County officials. The refinements consisted primarily of relocating the fuel island, realigning the general aviation ramp extension, adding more aviation-related lease parcels, and splitting the runway extension between the two ends of the runway. [It should be noted that the shift of extension of Runway 12-30 to the south will reduce the potential impact upon facilities to the north end of the runway.] It is expected that this concept will be further refined after the final review meeting with the PAC. This chapter describes, in narrative and graphic form, the recommended direction for the future use and development of Bishop Airport.

AIRFIELD DESIGN STANDARDS

The Federal Aviation Administration (FAA) has established design criteria to define the physical dimensions of runways and taxiways, and the imaginary surfaces surrounding them



which protect the safe operation of aircraft at the airport. These design standards also define the separation criteria for the placement of landside facilities. As discussed previously in Chapter Three, FAA design criteria is a function of the critical design aircraft's wingspan, approach speed, and the runway's approach visibility minimums. The FAA has established the Airport Reference Code (ARC) to relate these factors to airfield design standards.

Bishop Airport is presently used by a wide range of general aviation aircraft. Analysis conducted in Chapter Three, Facility Requirements, concluded that Bishop Airport's current critical design aircraft are business jet aircraft that fall within the ARC C-II category. The airport is able to handle larger aircraft on an itinerant basis if they do not exceed 500 operations per year.

The master plan anticipates that turbojet aircraft utilization (particularly business jet aircraft) will increase in the future consistent with the FAA's national forecasts. Therefore, this master plan has assumed that larger business aircraft and potential commercial regional jet aircraft will likely become the critical design aircraft for the airport over the next 20 years. To safely accommodate these aircraft at Bishop Airport, Runway 12-30 (the primary runway), is planned to ARC C-II design standards. Runway 16-34 and Runway 7-25, as crosswind runways, are being planned to meet ARC B-II standards. As shown in **Table 5A**, ARC C-II design standards specify larger runway safety area (RSA), object free area (OFA), and runway protection zones (RPZs) than ARC B-II standards. The current RPZs shown are based upon one statute mile visibility. As Runway 12-30 is upgraded to a precision instrument approach using global positioning system (GPS), and visibility minimums are lowered to 3/4-mile, the RPZs will increase in size.

The design of taxiway and apron areas must also consider the critical aircraft. The primary consideration is the wingspan of the most demanding aircraft. The parallel and connecting taxiways, transient apron areas, and aircraft maintenance areas have all been designed to accommodate aircraft within airplane design group (ADG) II.

RECOMMENDED MASTER PLAN CONCEPT

The recommended master plan concept incorporates individual elements from several of the alternatives presented in the last chapter. The final concept provides for anticipated facility needs over the next 20 years and optimizes the airport's ability to accommodate aviation demand in the Bishop region well beyond the 20-year period. The following sections summarize specific airside and landside recommendations included in the final concept.

Airside Recommendations

Airside recommendations, shown on **Exhibit 5A**, includes improvements for the runways, taxiways, airfield lighting,

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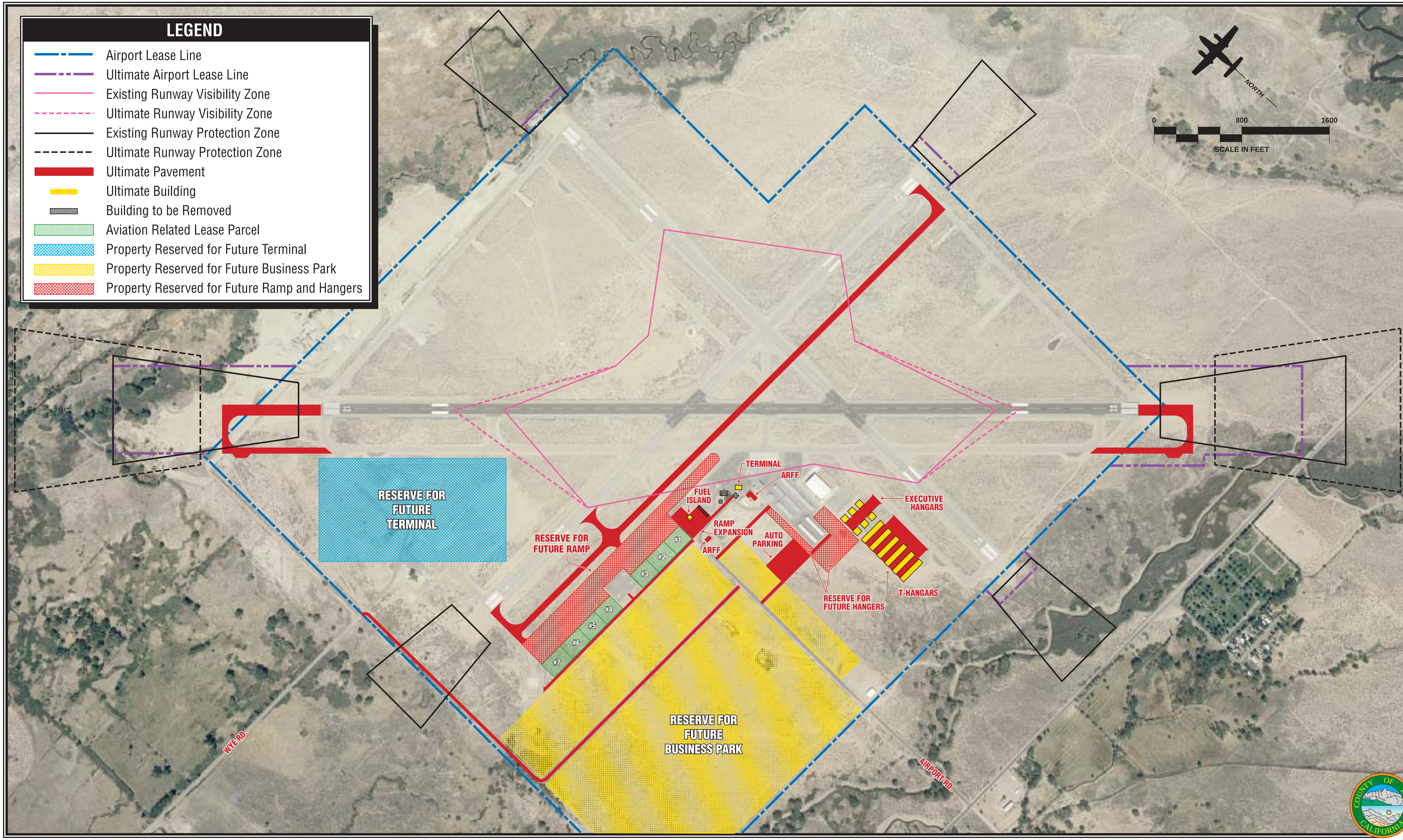


Exhibit 5A
AIRSIDE RECOMMENDATIONS

and instrument approaches. The following is a list of airside recommendations:

- OFAs currently extend beyond the airport lease line on several of the runways at Bishop Airport. The FAA recommends the control of these areas to protect the OFA from incompatible uses. These areas need to be addressed in the negotiations with the Los Angeles Division of Water and Power (LADWP) to extend the property boundaries of the existing lease.

TABLE 5A
Airfield Planning Design Standards (Ultimate)
Bishop Airport

	Runway 12-30	Runway 16-34	Runway 7-25
DESIGN STANDARDS			
Airport Reference Code (ARC)	***C-II***	***B-II***	***B-II***
Runways			
Length (ft.)	8,900 (7,498 existing)	5,600	5,566
Width (ft.)	100 (100 existing)	75 (100 existing)	75 (100 existing)
Pavement Strength (lbs.)			
Single Wheel (SWL)	70,000	100,000	40,000
Dual Wheel (DWL)	110,000	140,000	56,000
Dual Tandem Wheel (DTWL)	200,000	240,000	98,000
Runway Safety Area			
Width (ft.)	500 (150 existing)	150	150
Length Beyond Runway End (ft.)	1,000 (300 existing)	300	300
Object Free Area			
Width (ft.)	800 (500 existing)	500	500
Length Beyond Runway End (ft.)	1,000 (300 existing)	300	300
Runway Protection Zones			
Inner Width (ft.)	1,000 (500 existing)	500	500
Outer Width (ft.)	1,510 (1010 existing)	700	700
Length (ft.)	1,700 (1,700 existing)	1,000	1,000

- Apply ARC C-II standards to Runway 12-30. Currently, Runway 12-30 meets ARC B-II standards.

- Relocate and extend Taxiway B to the end of Runway 25, providing a full length parallel taxiway with access to and from the east end of the runway, and a new expanded general aviation ramp expansion area.

- Extend the existing general aviation ramp area. This extension will allow for safer movement of aircraft on the ramp and provide additional room for aircraft parking. It is anticipated that this extension will be completed in three phases as demand dictates.

- Upon documentation of the need for additional length, extend Runway 12-30 to 8,900 feet from the existing length of 7,498 feet. The extension will be split; 500 feet will be added to the southeast end and 900 feet to the northwest end of the runway. The runway will be designed to accommodate instrument approaches down to 3/4- mile visibility. Taxiway A will be extended simultaneously to continue to provide a full length parallel taxiway.

Landside Recommendations

The recommended master plan concept provides for the construction of a new general aviation terminal, new aircraft storage hangars, and an apron expansion. Landside recommendations are as follows:

- The removal and replacement of the existing general aviation terminal building. The new terminal building will be located north of the existing fuel tanks keeping it in a central location on the airport, with good visibility to the main runway.

- Relocate the long-term parking area. Currently, the long-term parking lot is located immediately behind the terminal building. Relocating long-term parking allows this area to serve short-term auto parking needs for the general aviation terminal.

- Construct additional aircraft storage hangars to accommodate existing owners who wish to rent hangar space, and the forecast 20-year levels of based aircraft. A series of T-hangars are proposed along the south end of Runway 34. A parcel of land is also reserved for a group of executive hangars (six hangars are shown on the layout). In addition, land surrounding the south and west side of the existing T-hangars has been reserved for future construction of additional T-hangars.

- Connect Wye Road with Airport Road providing easier access to the proposed commercial aviation and business park areas. In addition, Wye Road provides a more direct connection to Highway 395, providing a more direct route to the airport from town.

- Reserve a large area of land near the Wye Road entrance between Runway 7-25 and Runway 12-30 for a future commercial terminal site.

- Reserve a large area of land in the southwest corner of airport property to be used as a business park/light industrial area.

AIRPORT LAYOUT PLANS

The remainder of this chapter provides a brief description of the official layout drawings for the airport that will be submitted to the FAA for review and approval. These plans, referred to as the Airport Layout Plans (ALPs), will be completed by Inyo County staff and will be included in the final draft of the master plan to graphically depict the ultimate airfield layout, facility development, and imaginary surfaces which protect the airport from hazards. This set of plans includes:

- Airport Layout Plan
- Airport Airspace Drawing
- Approach Zone and Runway Protection Zone Drawings (all runways)
- On-Airport Land Use Drawing

The airport layout plan will be prepared on a computer-aided drafting system for future ease of use. The computerized plan set provides detailed information of existing and future facility layout on multiple layers that permits the user to focus in on any section of the airport at a desirable scale. The plan can be used as base information for design and can be easily updated in the future to reflect new development and more detail concerning existing conditions as made available through design surveys. The airport layout plan set is submitted to the FAA for approval and must reflect all future development for which federal funding is anticipated. Otherwise, the proposed development will not be eligible for federal funding. Therefore, updating these drawings to reflect changes in existing and ultimate facilities is essential.

AIRPORT LAYOUT PLAN

The Airport Layout Plan (ALP) graphically presents the existing and ultimate airport layout. Detailed airport and runway data are provided to facilitate the interpretation of the master plan recommendations. Both airfield and landside improvements 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, to be included in the 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 Part 77 Airspace Plan assigns three-dimensional imaginary areas to each runway. These imaginary surfaces emanate from the runway centerline and are dimensioned according to the visibility minimums associated with the approach to the runway end and size of aircraft to operate on the runway. 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 the future GPS approaches to Runway 12-30 is 1,000 feet wide. For all other runways, the primary surface is 500 feet wide.

- 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 the future GPS precision approaches to Runways 12 and 30 extends 10,000 feet from the end of the primary surface at an upward slope of 34:1 to a width of 3,500 feet. For all other runways, the approach surface extends 5,000 feet from the end of the primary surface at an upward slope of 20:1 to a width of 1,250 feet.

- 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 transitional surface is replaced by 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 end of the primary surfaces of each runway.

- CONICAL SURFACE

The conical surface begins at the outer edge of the horizontal surface. The conical 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 Zone and Runway Protection Zone Drawings, prepared for each of the runway approaches, are scaled drawings 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 Inyo County staff, engineers, or consultants with identification of existing obstructions or potential obstructions within these areas.

ON-AIRPORT LAND USE PLAN

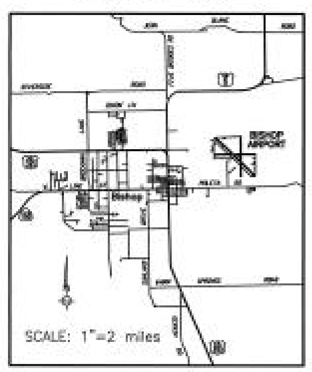
The objective of the On-Airport Land Use Plan is to coordinate uses of the airport property in a manner compatible with the functional design of the airport facility. Airport land use planning is important for the orderly development and efficient use of available space. There are two primary considerations 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. When development is proposed, it should be directed to the appropriate land use area depicted on this plan and coordinated with the local FAA office.

SUMMARY

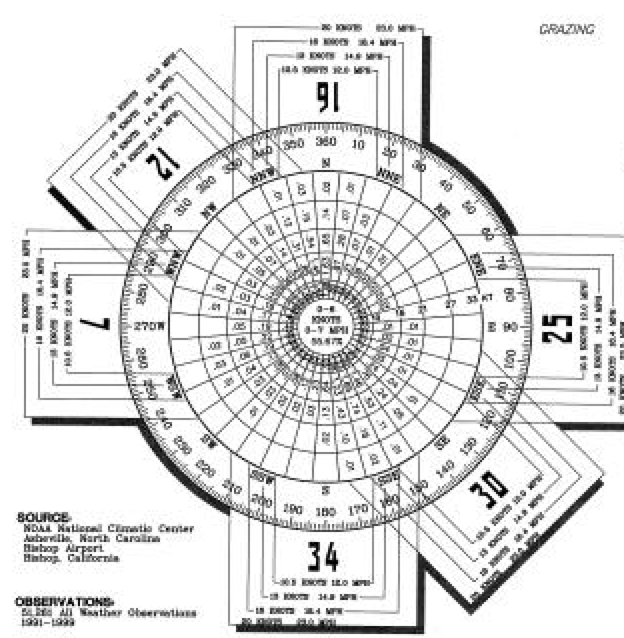
The airport layout plan set is designed to assist Inyo County in making decisions relative to future development and growth at the Bishop Airport. The plan includes development to satisfy expected airport demands over the next 20 years (and beyond). Flexibility will be a key to future development as activity may not occur exactly as forecast. The plan has considered demands that could be placed upon the airport even beyond the 20-year planning period to ensure that the facility is capable of accommodating a variety of circumstances. The F.A.R. Part 77 Airspace Plan should be used as a tool to ensure land use compatibility and restrict the heights of future structures or antennae which pose a hazard to air navigation surrounding the airport. The ALP set also provides Inyo County with options to pursue in marketing the assets of the airport for community and regional development. By following the general recommendations of the plan, the airport can maintain it's long term viability and continue to provide vital air transportation services to the region.

LOCATION MAP

VICINITY MAP

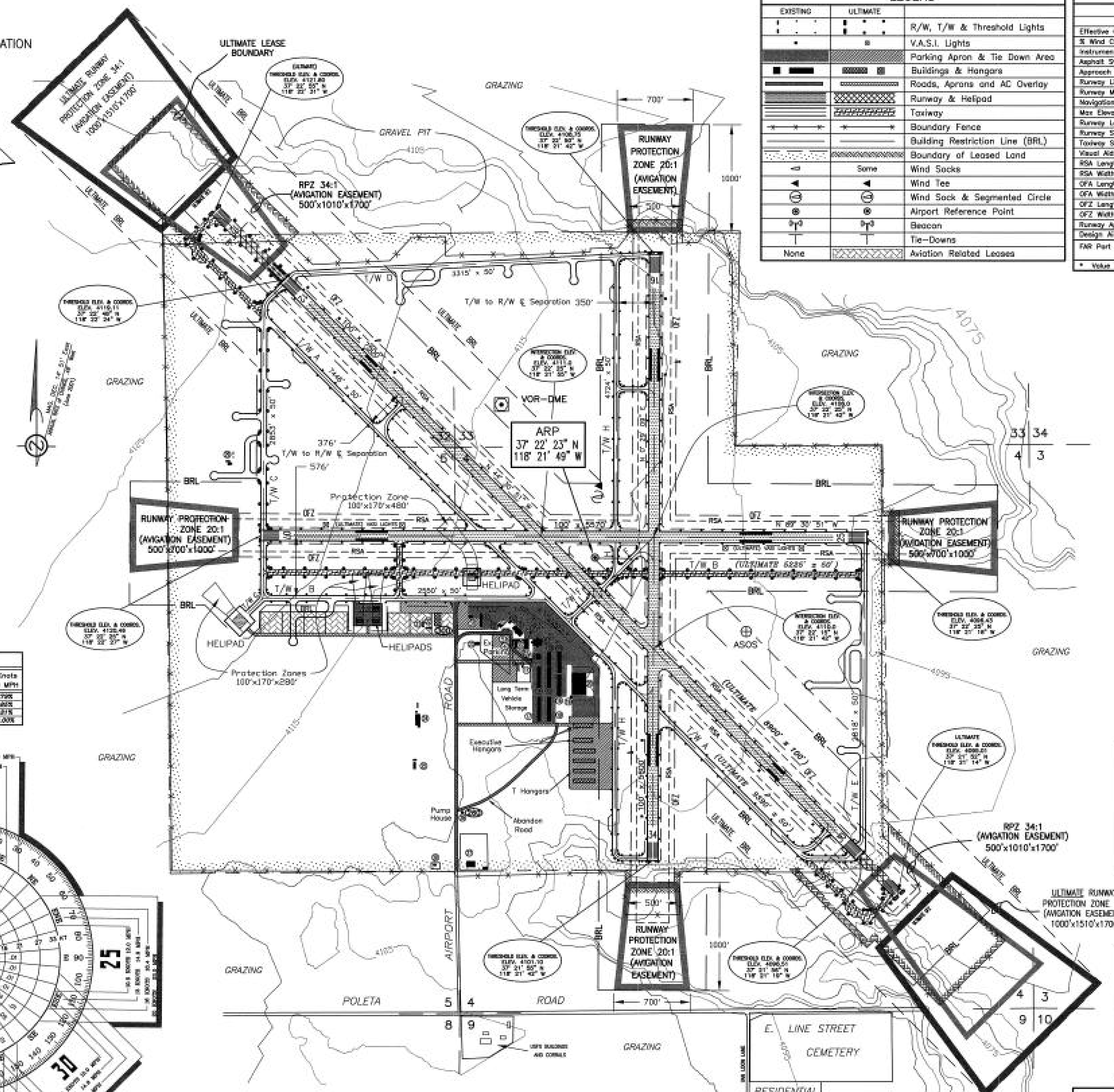


ALL WEATHER WIND COVERAGE				
Runways	10.5 Knots 12.0 MPH	13 Knots 14.9 MPH	16 Knots 18.4 MPH	20 Knots 23.0 MPH
Runway 12–30	94.48%	97.49%	99.77%	99.79%
Runway 16–34	96.94%	98.50%	99.49%	99.89%
Runway 7–25	88.45%	98.00%	94.50%	98.81%
Combined Runways	99.85%	99.96%	99.99%	100.00%



SOURCE:
NOAA National Climatic Center
Asheville, North Carolina
Bishop Airport
Bishop, California

OBSERVATIONS:
51,261 All Weather Observations
1991–1999



GRAPHIC SCALE

(IN FEET)
1 inch = 500 ft.

ELEVATIONS AND CONTOURS SHOWN IN FEET AMSL

CONTOURS INTERVAL: 5 FEET

LEGEND		
EXISTING	ULTIMATE	
		R/W, T/W & Threshold Lights
		V.A.S.I. Lights
		Parking Apron & Tie Down Area
		Buildings & Hangars
		Roads, Aprons and AC Overlay
		Runway & Helipad
		Taxiway
		Boundary Fence
		Building Restriction Line (BRL)
		Boundary of Leased Land
	Same	Wind Socks
		Wind Tee
		Wind Sock & Segmented Circle
		Airport Reference Point
		Beacon
		Tie–Downs
None		Aviation Related Leases

RUNWAY DATA TABLE						
	RUNWAY 07–25		RUNWAY 12–30		RUNWAY 16–34	
	EXISTING	ULTIMATE	EXISTING	ULTIMATE	EXISTING	ULTIMATE
Effective Gradient in %	0.43	0.43	0.30	0.30	0.14	0.14
% Wind Coverage (15 Knots)	93.09%	93.09%	98.80%	98.80%	99.24%	99.24%
Instrument Runway	None	None	None	12–30	None	16–34
Asphalt Strength *	40	Same	70	Same	100	Same
Approach Slope	20:1	20:1	34:1	34:1	20:1	20:1
Runway Lighting	M.I.R.L.	M.I.R.L.	M.I.R.L.	M.I.R.L.	M.I.R.L.	M.I.R.L.
Runway Marking	Non Precision	Same	Non Precision	Same	Non Precision	Same
Navigational Aids	VOR–DME	VOR–DME/GPS	VOR–DME	VOR–DME/GPS/I.L.S.	VOR–DME	VOR–DME/GPS
Max Elevation Above Mean Sea Level	4120.46'	Same	4119.11'	4121.80'	4108.75'	Same
Runway Length & Width	5570' x 100'	5570' x 100'	7500' x 100'	8900' x 100'	5600' x 100'	5600' x 100'
Runway Surface	Asphalt	Same	Asphalt	Same	Asphalt	Same
Taxiway Surface	Asphalt	Same	Asphalt	Same	Asphalt	Same
Visual Aids	None	V.A.S.I.	V.A.S.I.	V.A.S.I.	V.A.S.I.	V.A.S.I.
RSA Length Beyond Runway	300'	300'	300'	1000'	300'	300'
RSA Width	150'	150'	150'	500'	150'	150'
OFA Length Beyond Runway	300'	300'	300'	1000'	300'	300'
OFA Width	500'	500'	500'	800'	500'	500'
OFZ Length Beyond Runway	200'	200'	200'	200'	200'	200'
OFZ Width	400'	400'	400'	400'	400'	400'
Runway Approach Category	Category B II	Category B II	Category B II	Category C II	Category B II	Category B II
Design Aircraft	Convair 580	Convair 580	Convair 580	Lockheed 100–30 Hercules	Convair 580	Convair 580
FAR Part 77 Category by Rwy End	07 Non Precision	07 Non Precision	12 Non Precision	12 Precision	16 Non Precision	16 Non Precision
	25 Non Precision	25 Non Precision	30 Non Precision	30 Precision	34 Non Precision	34 Non Precision

* Value given is the total Aircraft weight in 1000 lbs. for single, wheel gear aircraft.

AIRPORT FACILITIES		
EXISTING	ULTIMATE	
1	None	Hangar
2	2	Fire House
3	3	Terminal
4	4	Quonset Hut
5	None	Civil Air Patrol
6	None	Hangar
7	None	Hangar
8	8	Hangar One
9	None	Storage
10	10	Hangar
11	11	Electrical Vault
12	12	Hangar
13	13	Hangar
14	14	Hangar
15	15	Hangar
16	16	Hangar
17	17	Hangar
18	18	Hangar
19	19	Hangar
20	20	Hangar A
21	21	Storage Trailer
22	22	FED EX Trailer
23	23	U.S. Weather Service
24	None	Old Hospital
25	None	Residence
26	[illegible]	Pump House
27	27	Search & Rescue
28	28	Westar Cable
29	29	USFS Air Tanker Base
30	[illegible]	Hangar
31	31	Fuel Island
32	32	Old Tower

AIRPORT DATA TABLE		
	EXISTING	ULTIMATE
Airport Elevation Above Sea Level	4120.46'	Same
Airport Reference Point (A.R.P.) NAD 83	37° 22' 23" N 118° 21' 49" W	37° 22' 23" N 118° 21' 49" W
Mean Maximum Temperature of Hottest Month (JULY)	97°	Same
Airport & Terminal NAVAIDS	Beacon,VOR–DME	Beacon/VOR–DME/GPS
GPS At Airport	None	All Runways
% Wind Coverage	100%	Same
Beacon	Photocell Actuated	Same
Airport Acreage	895.18 Ac.	953.28 Ac.
Acreage of leased lands	895.18 Ac.	953.28 Ac.

RUNWAY END LAT. & LONG. COORDINATES & ELEVATIONS		
	EXISTING	ULTIMATE
07 End Coordinates	37° 22' 25" N 118° 22' 26" W	Same Same
25 End Coordinates	37° 22' 25" N 118° 21' 18" W	Same Same
07 Elevation	4120.46'	Same
25 Elevation	4096.43'	Same
12 End Coordinates	37° 22' 48" N 118° 22' 24" W	37° 22' 55" N 118° 22' 31" W
30 End Coordinates	37° 21' 56" N 118° 21' 19" W	37° 21' 52" N 118° 21' 14" W
12 Elevation	4119.11'	4121.80'
30 Elevation	4096.51'	4095.01'
16 End Coordinates	37° 22' 50" N 118° 21' 42" W	Same Same
34 End Coordinates	37° 21' 55" N 118° 21' 42" W	Same Same
16 Elevation	4108.75'	Same
34 Elevation	4101.10'	Same

Reserved For FAA Approval Stamp

Approved conditionally AUG 19 2002
Subject to comments contained in our letter dated:
FEDERAL AVIATION ADMINISTRATION AUG 19 2002
Western-Pacific Region
By [signature]
Supervisor, Standards Section

TAXIWAY DATA TABLE		
	LENGTH & WIDTH	
	EXISTING	ULTIMATE
Taxiway A	7446' x 50'	9390' x 50'
Taxiway B	2550' x 50'	5225' x 50'
Taxiway C	2853' x 50'	Same
Taxiway D	3315' x 50'	Same
Taxiway E	2818' x 50'	Same
Taxiway F	907' x 50'	Same
Taxiway G	200' x 50'	Same
Taxiway H	4724' x 50'	Same

[signature]
APPROVED BY:
DIRECTOR OF PUBLIC WORKS
JEFFREY S. JEWETT

REGISTERED PROFESSIONAL ENGINEER JEFFREY S. JEWETT C 046053 Exp. 6-30-2004 CIVIL STATE OF CALIFORNIA

7/30/02 PLANS APPROVAL DATE

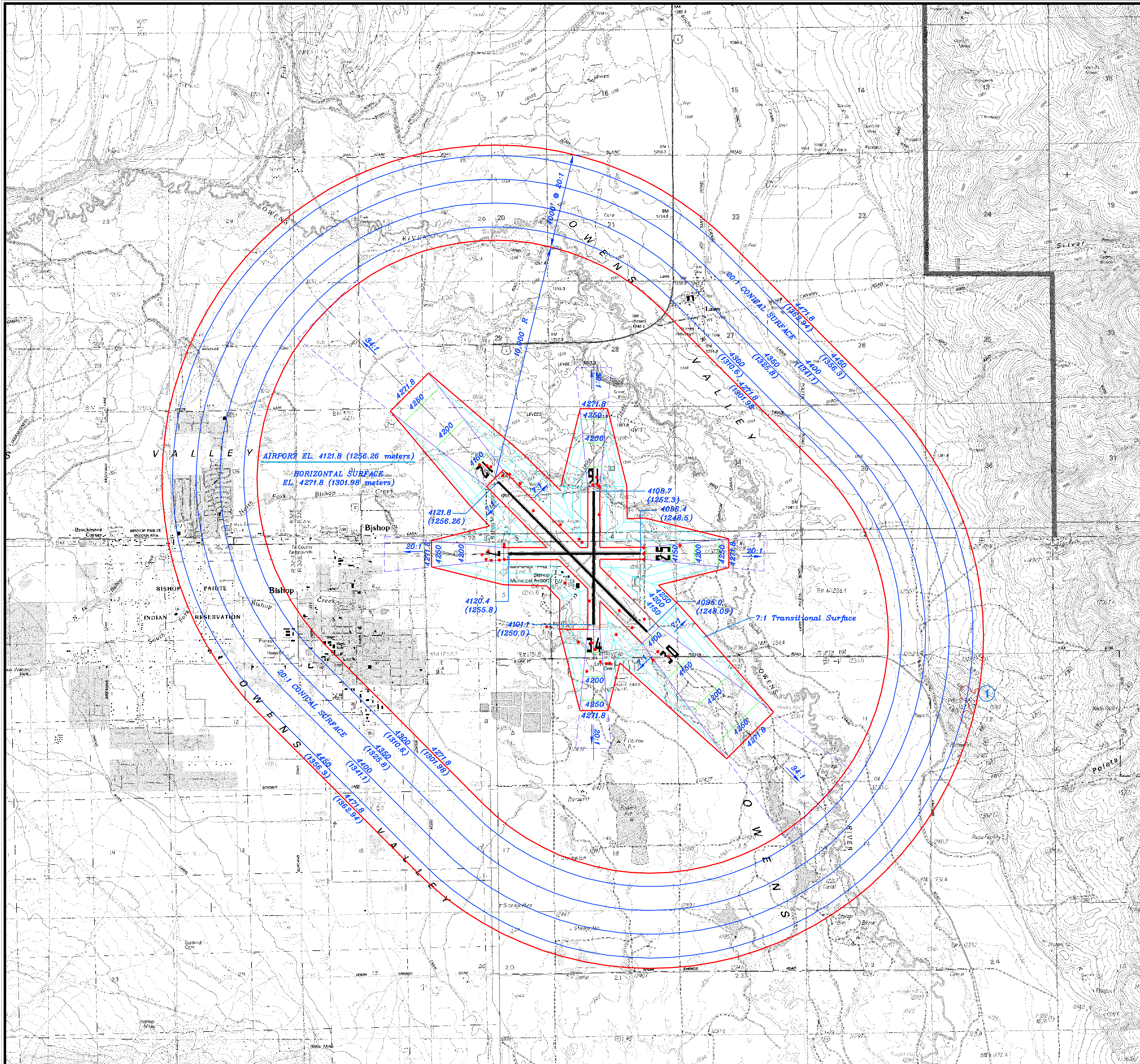
No	REVISIONS	DATE	BY	APP'D
3	Update of Airport Master Plan	6/30/02	PH	
2	Apron and R/W 7–25 Improvements	9/8/94	RC	
1	AWOS III and NWS Antenna Additions	8/18/92	RC	

"THE CONTENTS OF THIS PLAN DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THIS DOCUMENT 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."

Plans Prepared by:
INYO COUNTY PUBLIC WORKS
168 N. Edwards St., P.O. Drawer Q
Independence, CA 93526
(760) 878–0201

BISHOP AIRPORT
AIRPORT LAYOUT PLAN
BISHOP, CALIFORNIA

Revised By: P. HANCOCK	Date: 7/02	Drawn by: S. LOWE	Date: 02/98	Checked By: R. Chegwidden	Date: 7/02	Drawing Name: bishalp1–500sc.dwg	SHEET 1 OF 1



OBSTRUCTION TABLE

Object Description	Object Elevation	Obstructed Part 77 Surface	Surface Elevation	Object Penetration	Proposed Object Disposition
1 TOPOGRAPHY	4495 MSL	CONICAL SURFACE	4450 MSL	45'	REQUEST AERONAUTICAL STUDY

OBSTRUCTION LEGEND

- OBSTRUCTION
- TOPOGRAPHY
- MULTIPLE OBSTRUCTIONS (TREES)

METRIC EQUIVALENTS

ELEVATION (in Feet)	ELEVATION (in Meters)
Rwy 25 EL. 4096.4	(1248.52)
Rwy 30 EL. 4095.0	(1248.09)
Rwy 34 EL. 4101.1	(1249.95)
Rwy 16 EL. 4108.7	(1252.29)
Rwy 12 EL. 4121.8	(1256.26)
Rwy 07 EL. 4120.4	(1255.84)
4100 MSL	(1249.62)
4150 MSL	(1264.86)
4200 MSL	(1280.10)
4250 MSL	(1295.34)
4271.8 MSL	(1301.98)
4300 MSL	(1310.58)
4350 MSL	(1325.82)
4400 MSL	(1341.05)
4450 MSL	(1356.29)
4471.8 MSL	(1362.94)

METRIC EQUIVALENTS

SPOT ELEVATION (in Meters)	ELEVATION (in Feet)
1233	4045.5 MSL
1240	4068.4 MSL
1244	4081.6 MSL
1246	4088.1 MSL
1248	4094.7 MSL
1250	4101.3 MSL
1251	4104.5 MSL
1254	4114.4 MSL
1256	4120.9 MSL
1258.9	4130.5 MSL
1263	4143.9 MSL
1268	4160.3 MSL
1275.7	4185.6 MSL
1300	4265.3 MSL
1328	4357.2 MSL
1370	4495.0 MSL

GENERAL NOTES:

1. Obstructions, clearances, and locations are calculated from ultimate runway end elevations and ultimate approach surfaces, unless otherwise noted.
2. Depiction of features and objects within the primary, transitional, and horizontal Part 77 surfaces, is illustrated on the AIRPORT AIRSPACE DRAWING.
3. Depiction of features and objects within the outer portion of the approach surfaces, is illustrated on the APPROACH PROFILES DRAWING.
4. Depiction of features and objects within the inner portion of the approach surfaces, is illustrated on the INNER PORTION OF THE APPROACH SURFACE DRAWING.
5. Additional obstruction data is illustrated on National Ocean Survey document OC 5737, NOS AIRPORT OBSTRUCTION CHART.

NORTH

0 2000 4000 6000
SCALE IN FEET

Prepared by: Coffman Associates Airport Consultants www.coffmanassociates.com

Prepared For:
INYO COUNTY PUBLIC WORKS
Independence, California

BISHOP AIRPORT
AIRPORT AIRSPACE DRAWING
INYO COUNTY, CALIFORNIA

Date: November 27, 2001 | FAR PART-77 AIRSPACE

Revised By:	Date:	Drawn by:	Date:	Checked By:	Date:	Drawing Name:	
		L.D. Johnson	11/01	Stephen C. Wagner	11/01	bihpt77.dwg	SHEET 1 OF 1

Chapter Six
FINANCIAL PLAN

CHAPTER SIX

Financial Plan

The successful implementation of the Bishop Airport Master Plan will require sound judgement on the part of Inyo County. Timing and airport activity are among the more important factors influencing decision-makers to carry out a recommendation. These two factors should be used as key reference points in plan implementation.

Experience has indicated that major problems have materialized from the standard format of past planning documents using time-based milestones. These problems center around the plan's lack of flexibility and inherent inability to deal with new issues that develop from unforeseen changes that may occur after the plan is completed. The demand-based format used in the development of this master plan will attempt to deal with this issue.

While it is necessary for scheduling and budgeting purposes to consider the timing of airport development, the actual need for facilities is established by airport activity and demand. Proper master planning implementation suggests the use of airport activity levels rather than time as guidance for development. Tracking airport activity levels, and then comparing those levels to forecast activity levels and facility requirements, provides decision-makers with the ability to anticipate and plan when actual facilities are needed.

This chapter of the master plan is intended to become one of the primary references for decision-makers responsible for implementing master plan recommendations. Consequently, the narrative and graphic presentation provide an understanding of each recommended development item. This understanding will be critical in maintaining a realistic and cost effective program that provides maximum benefit to Inyo County, the

State of California, the Federal Aviation Administration (FAA), and airport users.

AIRPORT DEVELOPMENT SCHEDULES AND COST SUMMARIES

Once the specific needs and improvements for the airport have been established, the next step is to determine a realistic schedule and costs for implementing the plan. The airport development plan presented in this chapter outlines the estimated costs and timing associated with each recommended project. In addition, estimates of state and federal funding eligibility are discussed. The local cost is also shown after taking into account all state and federal funding available. This section will examine the overall cost of each item in the development plan and present a development schedule.

Forecasted demand and operational changes can, and will, occur frequently on short notice. As a result, the airport development plan has been divided into short term (0-5 years), intermediate term (6-10 years), and long term (11-20 years) planning horizons. **Table 6A** summarizes the key milestones for each of the three planning horizons.

TABLE 6A
Planning Horizon Activity Levels
Bishop Airport

	2001	Short Term	Intermediate Term	Long Term
Based Aircraft	75	83	94	118
Annual Operations	30,000	33,200	37,600	47,200
Passenger Enplanements (potential)	0	10,515	12,727	17,610

The short term planning horizon contains items of high priority that should be considered as Bishop Airport begins to approach the milestones identified for the short term. As the short term horizon activity levels are reached, it will be time to begin programming for the intermediate term based upon the next level of activity milestones. Similarly, when the intermediate term milestones are reached, it will be time to start programming for the long term activity milestones.

As a master plan is only a conceptual document, implementation of capital projects should only be undertaken after further refinement of their design and costs through architectural and engineering analyses. The cost estimates presented in this chapter have been increased to allow for engineering and any other contingencies that may arise on the project. Capital costs should be viewed only as estimates subject to further refinement during design. Nevertheless, these estimates are considered sufficiently accurate for performing the feasibility analyses in this chapter. Cost estimates for each of the development projects listed in the capital improvement plan are listed in current (2001) dollars. **Table 6B** presents the proposed capital improvement program for Bishop Airport.

SHORT TERM PLANNING HORIZON IMPROVEMENTS

The short term planning horizon capital improvement program centers around the immediate needs of day-to-day operations at the airport. The airport has witnessed several projects which have significantly improved current conditions including the rehabilitation of Runway 12-30 and construction of additional T-hangars. The County is currently in the process of building a new terminal building and relocating the fuel storage tanks and fuel island.

Airfield projects in the short term include reconstructing Taxiway C, putting down an overlay on Taxiways H and A, and extending the general aviation ramp area. In addition, Taxiway F will also be scheduled for rehabilitation and new Runway End Identifier Lights (REIL) will be installed on Runways 12-30 and 16-34.

The short term program includes several landside projects as well. First is the installation of new water service and fire hydrants to the southwest quadrant of the airport. New infrastructure, including electrical, will be updated for the existing users and extended for the proposed business park. In addition, the existing terminal building is being removed and replaced with a new, larger building. A series of T-hangars will be constructed on the south end of Runway 16-34. Finally, new access roads will be built to provide better access to hangars and the terminal building area.

Short term projects, graphically depicted on Exhibit 6A, have been estimated at a total cost of $5.4 million. Of that total, approximately $2.8 million will need to be provided by the County.

INTERMEDIATE TERM PLANNING HORIZON IMPROVEMENTS

Intermediate term goals focus primarily on updating airside facilities to accommodate expected increases in annual operations and based aircraft. These planned upgrades will improve the operational safety of the airport and aid in the preservation of key airport assets.

Airside improvements include a mill and overlay of Runway 16-34. This reconstruction will keep the runway in use for many more years and will prevent the degradation of the existing surface. Taxiway B, the partial parallel taxiway for Runway 7-25, will be relocated to the north and extended east for the full length of the runway. The newly relocated Taxiway B will have Medium Intensity Taxiway Lights (MITL) installed at the time of construction. The taxiway improvements will provide all three runways at Bishop Airport with full length parallel taxiways. Precision Approach Path Indicator (PAPI) lights will be installed on Runways 16-34 and 12-30 to provide better approach information to pilots using the airport. Taxiways D, E, and Runway 7-25 will undergo preventive rehabilitation during this time frame. Finally, the general aviation ramp area will undergo a significant expansion, adding over 26,000 square yards.

Landside improvements in the intermediate planning horizon include the construction of a new road connecting Wye Road on the western edge of the airport to Airport Road on the south side of the airport. This new road will provide access to the new business park and a new entrance from town, allowing airport users to avoid traveling through downtown Bishop to reach the airport. In addition, this road will provide needed access to the business park and will prompt the extension of roads and utilities for the Phase II business park development.

Intermediate projects, graphically depicted on Exhibit 6A, have been estimated at $5.3 million total cost. Of that total, approximately $1.0 million will need to be provided by the County.

LONG TERM PLANNING HORIZON IMPROVEMENTS

Long term improvements to Bishop Airport continue to focus on airside improvements. The largest project during this phase will be the extension of Runway 12-30 and Taxiway A. At the same time, runway and taxiway lighting will need to be extended, and the markings on the runway will need to be upgraded to precision markings. During the extension of Runway 12-30, the existing portion of the runway will be rehabilitated. The long term plan also calls for the installation of a Medium Intensity Approach Lights with Runway Alignment Indicator Lights (MALSR) on Runway 30 to upgrade approach capabilities of the airport. To support a precision GPS approach to Runway 30, a Local Area Augmentation System (LAAS) has been scheduled for the airport. Also scheduled for this time frame is the construction of a new ARFF facility and the purchase of a new ARFF truck which will provide the airport with needed equipment to pursue F.A.R. Part 139 certification in the future. Additionally, the third and final phase of the general aviation ramp extension is scheduled to be completed along the south side of Runway 7-25 during this planning horizon. Utilities and roadways will also be extended to allow for Phase III development of the business park.

Long term projects, graphically depicted on Exhibit 6A, have been estimated at $5.6 million total cost. Of that total, approximately $1.0 million will need to be provided by the County.

AIRPORT DEVELOPMENT AND FUNDING SOURCES

Financing future airport improvements will not rely exclusively upon the

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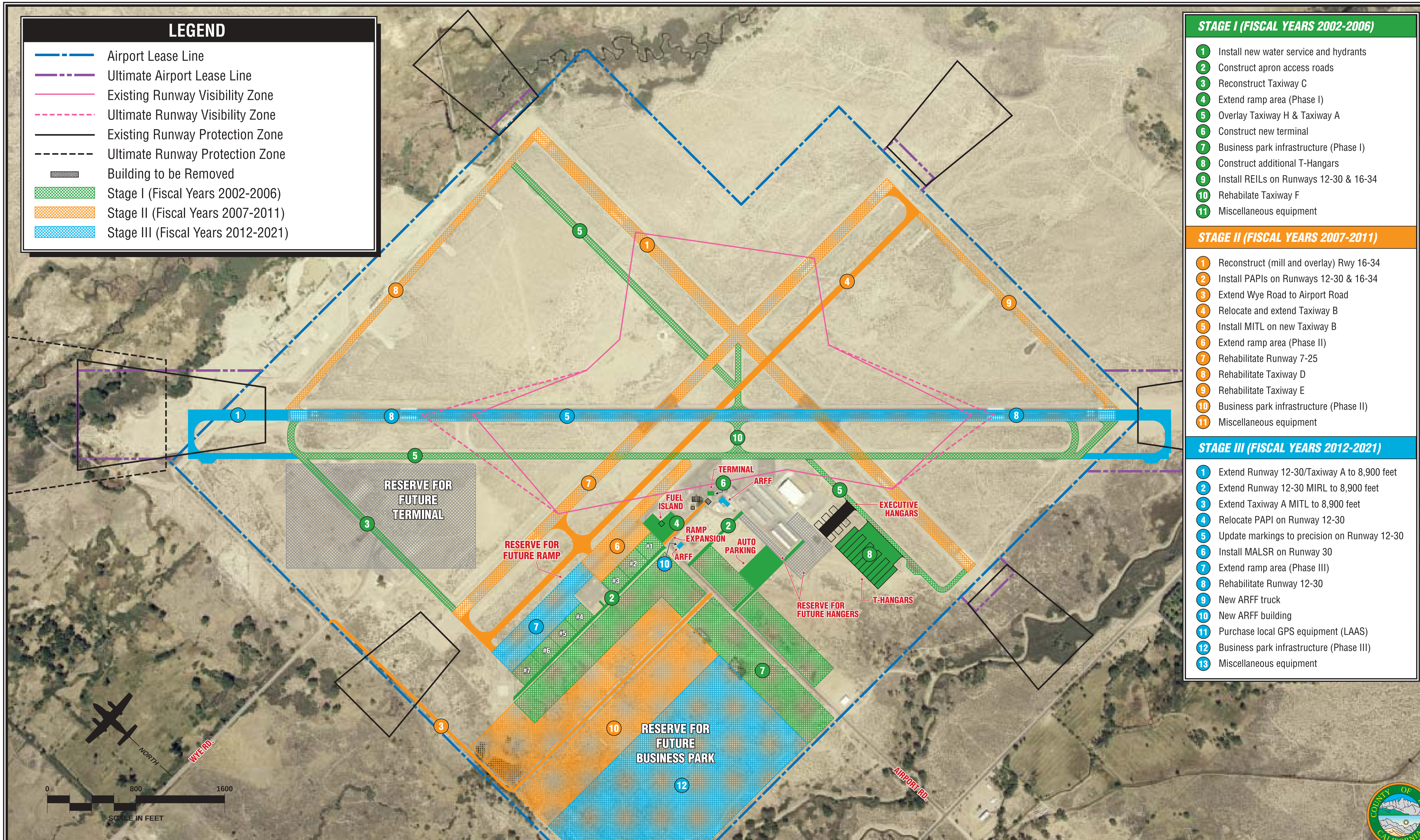


Exhibit 6A
DEVELOPMENT STAGING

financial resources of Inyo County. Airport improvement funding assistance is available through various grants-in-aid programs at both the state

TABLE 6B
Bishop Airport
Capital Improvement Program

Development Item	Total Cost	AIP Eligible	State Funds	Inyo County Funds	F&E* Funds
Stage I (Fiscal Years 2002-2006)					
1 .Install new water service and hydrants	$557,000	$501,300	$27,850	$27,850	$0
2 .Construct Apron Access Roads	216,000	194,400	10,800	10,800	0
3 .Reconstruct Taxiway C	350,000	315,000	17,500	17,500	0
4 .Extend Ramp area (Phase I)	698,000	628,200	34,900	34,900	0
5 .Overlay Taxiway H & Taxiway A	600,000	540,000	30,000	30,000	0
6 .Construct New Terminal	500,000	0	0	500,000	0
7 .Business Park Infrastructure (Phase I)	792,000	0	0	792,000	0
8 .Construct Additional T-Hangars	1,380,000	0	0	1,380,000	0
9 .Install REILs on Runways 12-30 & 16-34	120,000	0	0	0	120,000
10 Rehabilitate Taxiway F	27,000	24,300	1,350	1,350	0
11 .Miscellaneous Equipment	150,000	135,000	7,500	7,500	0
Total Stage I Development	***$5,390,000***	***$2,338,200***	***$129,900***	***$2,801,900***	***$120,000***
Stage II (Fiscal Years 2007-2011)					
1 .Reconstruct (mill and overlay) Rwy 16-34	$903,000	$812,700	$45,150	$45,150	$0
2 .Install PAPIs on Runways 12-30 and 16-34	70,000	0	0	0	70,000
3 .Extend Wye Road to Airport Road	318,000	286,200	15,900	15,900	0
4 .Relocate and Extend Taxiway B	1,415,000	1,273,500	70,750	70,750	0
5 .Install MITL on new Taxiway B	236,000	212,400	11,800	11,800	0
6 .Extend Ramp area (Phase II)	1,024,000	921,600	51,200	51,200	0
7 .Rehabilitate Runway 7-25	249,000	224,100	12,450	12,450	0
8 .Rehabilitate Taxiway D	86,000	77,400	4,300	4,300	0
9 .Rehabilitate Taxiway E	75,000	67,500	3,750	3,750	0
10 .Business Park Infrastructure (Phase II)	792,000	0	0	792,000	0
11 .Miscellaneous Equipment	150,000	135,000	7,500	7,500	0
Total Stage II Development	***$5,318,000***	***$4,010,400***	***$222,800***	***$1,014,800***	***$70,000***
Stage III (Fiscal Years 2012-2021)					
1 .Extend Runway 12-30/Taxiway A to 8,900'	$2,061,000	$1,854,900	$103,050	$103,050	$0
2 .Extend Runway 12-30 MIRL to 8,900 feet	27,000	24,300	1,350	1,350	0
3 .Extend Taxiway A MITL to 8,900 feet	27,000	24,300	1,350	1,350	0
4 .Relocate PAPI on Runway 12-30	12,000	10,800	600	600	0
5 .Update markings to precision on Rwy. 12-30	10,000	9,000	500	500	0
6 .Install MALSR on Runway 30	450,000	0	0	0	450,000
7 .Extend Ramp area (Phase III)	1,194,000	1,074,600	59,700	59,700	0
8 .Rehabilitate Runway 12-30	335,000	301,500	16,750	16,750	0
9 .New ARFF Truck	250,000	225,000	12,500	12,500	0
10 .New ARFF Building	150,000	135,000	7,500	7,500	0
11 .Purchase local GPS equipment (LAAS)	100,000	90,000	5,000	5,000	0
12 .Business Park Infrastructure (Phase III)	792,000	0	0	792,000	0
13 .Miscellaneous Equipment	150,000	135,000	7,500	7,500	0
Total Stage III Development	***$5,558,000***	***$3,884,400***	***$215,800***	***$1,007,800***	***$450,000***
Total Program Cost	**$16,266,000**	**$10,233,000**	**$568,500**	**$4,824,522**	**$640,000**

* FAA Facilities and Equipment Division

REIL - Runway End Identifier Lights
PAPI - Precision Approach Path Indicator
MITL - Medium Intensity Taxiway Lights
MIRL - Medium Intensity Runway Lights
MALSR - Medium Intensity Approach Lights with Runway Alignment Indicator Lights
LAAS - Local Area Augmentation System
ARFF - Airport Rescue and Firefighting

and federal levels. The following discussion outlines the key sources for airport improvement funding and how they can contribute to the successful implementation of this master plan.

FEDERAL AID TO AIRPORTS

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

The four-year bill covers FAA fiscal years 2000 through 2003. This legislation authorized funding levels significantly higher than ever before. Airport Improvement Program (AIP) funding was authorized at $2.475 billion in 2000, $3.2 billion in 2001, $3.3 billion in 2002, and $3.4 billion in 2003.

The source for AIP funds is the Aviation Trust Fund. This fund was established in 1970 to provide funding for aviation capital investment programs (facilities and equipment, research and development, and grants for airport development and expansion projects.) The Aviation Trust Fund is funded by federal user fees and taxes on airline tickets, aviation fuel, and various aircraft parts.

AIP funds are distributed each year by the FAA under authorization from the United States Congress. A portion of each year's authorized level of AIP funding is distributed to all eligible commercial service airports through an entitlement program that guarantees a minimum level of federal assistance. These dollars are calculated based on enplanement and cargo service levels. Under AIR-21, the distribution for fiscal year 2000 was a minimum of $650,000 to each commercial service airport enplaning at least 10,000 passengers annually. In the remaining years of AIR-21, the minimum entitlement can increase to $1.0 million annually. This higher funding is dependent upon Congress appropriating the amounts authorized by AIR-21 each fiscal year.

In addition, if Congress does appropriate the full amounts authorized by AIR-21, general aviation airports may receive up to $150,000 of funding each year. The remaining AIP funds are distributed by the FAA to airports based upon the priority of the project for which they have requested federal assistance through federal discretionary apportionments. A national priority ranking system is used to evaluate and rank each airport project. Those projects with the highest priority are given preference in receiving discretionary funding.

As is evident from the airport development schedule cost summaries, Inyo County will rely primarily on federal discretionary funding (since they are not a commercial service airport) to implement many of the development needs. An important point to consider is that federal discretionary funding is not guaranteed each year for the airport.

In California, airport development projects at general aviation airports that meet FAA's eligibility requirements receive 90 percent funding from the AIP. Eligible projects include any public use facility such as airfield or apron area improvements. Revenue-generating projects, such as hangar or fuel facility construction, are not eligible for AIP funding.

FAA FACILITIES AND EQUIPMENT PROGRAM

The Airway Facilities Division of the FAA administers the National Facilities and Equipment (F&E) Program. This annual program provides funding for the installation and maintenance of various navigational aids and equipment for the national airspace system and airports. Under the F&E program, funding is provided for FAA airport traffic control towers (ATCT), enroute navigational aids such as VOR, and on-airport navigational aids (such as PAPIs and approach lighting systems). As activity levels and other developments warrant, the airport may be considered by the FAA Airways Facilities Division for the installation and maintenance of navigational aids through the F&E program.

STATE AID TO AIRPORTS

In support of the state airport system, the California Transportation Commission (CTC) also participates in state airport development projects. An Aeronautics Account has been established within the State Transportation Fund from which all airport improvement monies are drawn. Tax revenues from the sale of general aviation jet fuel ($0.02 per gallon) and Avgas ($0.18 per gallon) are collected and deposited in the Aeronautics Account to support the state airport system development program.

The California Transportation Commission has established three types of grants to distribute funds deposited in the Aeronautics Account: Annual Grants, Acquisition and Development (A&D) Grants, and AIP Matching Grants. An additional source of funding provided by the CTC is low interest loans. Each of these items are briefly discussed below.

Annual Grants

Annual grants are distributed by the CTC for projects considered "airport and aviation purposes" as defined in the State Aeronautics Act. All public use airports, with the exception of reliever and commercial service airports, are eligible for this annual $10,000 grant.

Acquisition And Development Grants

Acquisition and Development (A&D) grants are designed to provide funding to airports for the purpose of land acquisition and development. This grant has a minimum allocation level of $10,000 and provides up to $500,000 per fiscal year (maximum allowable funding to a single airport yearly). Grant requests are initiated through the CIP process and require a local match of 10 to 50 percent of the project's cost. Unlike annual grants, all airports are eligible for the A & D grant.

AIP Matching Grants

The AIP grant is distributed for the purpose of aiding an airport with the local match of a federally-funded improvement project. In order to be eligible for an AIP matching grant, the project must have been included in the state CIP and the sponsor must have accepted a federal AIP grant for the project. Projects involved with air carrier improvements are not eligible for this grant. This grant provides 4.5 percent of the project's eligible cost (i.e. five percent of the AIP grant) and counts towards the yearly $500,000 maximum grant disbursement level.

California Airport Loan Program

The loan program provides funding for all airports within the State of California which are owned by an eligible public agency and open to the public without exception. These loans provide funding to eligible airports for construction and land acquisition projects. The loans can be used for any airport-related project and the funding limits are not bound by law or regulation. The amount of the loan is determined in accordance with project feasibility and the sponsor's financial status. Terms of the loan provide eight to 15 years for its payback and the interest rate is based upon the most recent state bond sale.

LOCAL SHARE FUNDING

The balance of project costs, after consideration has been given to the various grants available, must be funded through airport resources. Usually, this is accomplished through the use of airport earnings and reserves, to the extent possible, with the remaining costs financed through obligation bonding mechanisms.

Bishop Airport is leased and operated by Inyo County with support from revenues generated by the collection of various rates and charges from general aviation sources. These revenues are generated specifically by airport operations; however, there are restrictions on the use of revenues collected by the airport. All receipts, excluding bond proceeds or related grants and interest, are irrevocably pledged to the punctual payment of operating and maintenance expenses, payment of debt service for as long as bonds remain outstanding, or to additions or improvements to airport facilities. **Table 6C** presents historical expenses and revenues for Bishop Airport.

REVENUES

Revenues at the Bishop Airport include fuel sales (both AvGas and Jet A), hangar rentals, building and land leases, and long term auto parking. As shown on **Table 6C**, revenue has exceeded expenses five out of the past seven years.

The largest revenue generator for the airport is the sale of fuel. Fuel sales account for over 70 percent of the airport's annual revenue.

The second largest source of revenue for the airport is the lease of hangar space. This revenue is generated from both the T-hangars at the airport and from the small and large conventional hangars.

Following hangar leases in revenue earned are building and land lease income. Leases include portions of the terminal building and grounds on airport property. The auto park has been a consistent source of revenue for many years at the airport. This lot is for the long term storage of vehicles. Other revenues include miscellaneous revenues and interest income.

TABLE 6C
Bishop Airport
Historical Revenue and Expenses

Year	1994	1995	1996	1997	1998	1999	2000
REVENUES:							
Jet A Sales	$297,316	$247,738	$251,501	$195,978	$275,045	$219,797	$219,889
AvGas Sales	224,494	193,329	164,061	185,533	153,381	163,396	153,984
Auto Park	13,299	11,941	11,235	12,148	12,750	13,975	14,065
Hangar Rents	66,770	58,803	76,202	58,662	60,340	66,251	71,291
Building Leases	16,921	18,318	26,928	20,274	44,715	37,324	32,436
Land Lease	3,608	15,570	450	7,450	225	0	18,450
Misc. Revenue	6,888	4,907	8,361	7,552	33,853	5,791	17,843
Landing Fee	5,927	4,293	5,783	4,869	4,099	4,831	4,957
TOTAL REVENUES	**$635,223**	**$554,899**	**$544,521**	**$492,466**	**$584,408**	**$511,365**	**$532,915**
EXPENSES:							
Fuel/Oil	$386,763	$306,819	$311,568	$277,339	$313,039	$274,366	$275,273
Personnel	141,394	153,054	123,163	140,294	122,169	115,356	128,515
Lease/Taxes	24,997	25,289	24,769	24,270	25,100	25,733	26,298
Maintenance	25,290	17,828	9,958	8,897	7,413	13,459	2,335
Utilities	16,411	17,418	15,549	20,507	28,684	24,896	26,113
Insurance	12,591	13,692	12,344	12,962	13,066	13,855	9,277
Other	24,498	29,131	6,814	31,734	50,141	32,656	59,718
TOTAL EXPENSES	**$631,944**	**$563,231**	**$504,165**	**$516,003**	**$559,612**	**$500,321**	**$527,529**
NET INCOME/(LOSS)	**$3,279**	**($8,332)**	**$40,356**	**($23,537)**	**$24,796**	**$11,044**	**$5,386**

EXPENSES

Generalized operating expenses for Bishop Airport include fuel and oil, personnel, lease and taxes, maintenance, utilities, insurance, and other miscellaneous costs. As shown on **Table 6C**, total expenditures at the airport have remained relatively steady over the past seven years. Fuel and oil have been, and will continue to be, the single largest expense at the airport as long as the County maintains control of fuel sales. Personnel is the second highest cost at the airport. This cost includes all salaries, insurance, and payroll taxes for staff at the airport. After these two expenses, a variety of smaller expenses make up the total costs including maintenance, insurance, and other charges.

FUTURE CASH FLOW

Revenues

Future revenues will continue to be dominated by fuel sales at the airport. Through the long term, it will account for nearly 70 percent of total revenues. It is expected that revenues will continue to increase with aviation activity. As more aircraft are based at the airport, revenues for fuel sales and hangar rents should increase proportionally. Transient aircraft activity is also projected to increase which will provide additional revenues.

Revenues projected from hangar, building, office, and land leases will continue to provide a significant source of income to the County. Existing and future leases should always include provisions for the adjustment of the lease amount due to increases in the consumer price index (CPI) and property values. The typical review period ranges up to five years. It is recommended that all applicable leases include a review of CPI and property value every three to five years so that necessary adjustments to lease rates can be made.

Future revenue projections indicate that revenues will rise at a faster rate than expenditures. Analysis presented in **Table 6D** indicate that the County will generate sufficient revenues to offset expenses.

Non-Aeronautical Land Development

The FAA allows airports to utilize airport property considered "excess" or "surplus" for non-aeronautical commercial development. Many airports across the country have taken advantage of this opportunity to develop business parks, industrial parks, or other commercial activities which have generated significant revenues through leases or sale of land. The resulting "fair market" income is required to be used for the development and operation of the airport. These funds may not be used for any non-airport purposes. Prior to releasing any airport property for non-aeronautical uses, the airport sponsor must first obtain FAA approval.

As illustrated in Chapter Five - Airport Plans, a large parcel of land in the southwest corner of the airport property has been identified for non-aeronautical uses in the form of a business park or light industrial area. This would provide a large area of land that could be marketed to businesses that may not have an aviation-related focus. The area is well away from runway, taxiway, and apron areas. This location would not preclude aviation-related businesses from locating here, such as an avionics repair shop, parts distributor, or other. If approved by the FAA, the property could be utilized as a source of income to help support both the airport's daily operation and long term development.

TABLE 6D
Future Cash Flow Analysis
Bishop Airport

	Actual	Projected						
	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Inter-mediate	Long Range
REVENUES								
Misc. Revenue	17,843	$18,111	$18,382	$18,658	$18,938	$19,222	$20,104	$22,495
Land Lease	18,450	19,004	19,574	20,161	20,766	21,389	23,392	29,278
Bldg. Lease	32,436	32,923	33,416	33,918	34,426	34,943	36,547	40,893
Hangar Rent	71,291	73,430	75,633	77,902	80,239	82,646	90,388	113,129
Landing Fees	4,957	5,031	5,107	5,183	5,261	5,340	5,585	6,249
Auto Park	14,065	14,276	14,490	14,707	14,928	15,152	15,848	17,732
Fuel Sales	373,873	381,350	388,977	396,757	404,692	412,786	438,224	509,013
Total Revenues	**$532,915**	**$544,124**	**$555,579**	**$567,286**	**$579,250**	**$591,477**	**$630,089**	**$738,790**
EXPENSES								
Personnel	128,515	130,443	132,399	134,385	136,401	138,447	144,803	162,022
Insurance	9,277	9,416	9,557	9,701	9,846	9,994	10,453	11,696
Maintenance	2,335	10,000	10,150	10,302	10,457	10,614	11,101	12,421
Utilities	26,113	26,896	27,703	28,534	29,390	30,272	33,108	41,438
Other	59,718	60,614	61,523	62,446	63,383	64,333	67,287	75,288
Lease/Taxes	26,298	26,561	26,827	27,095	27,366	27,639	28,480	30,696
Fuel/Oil	275,273	280,778	286,394	292,122	297,964	303,924	322,653	374,773
Total Expenses	**$527,529**	**$544,708**	**$554,554**	**$564,585**	**$574,807**	**$585,223**	**$617,884**	**$708,334**
Income (Loss)	**$5,386**	**$(584)**	**$1,026**	**$2,701**	**$4,443**	**$6,254**	**$12,204**	**$30,456**

Source: 2000 data from County records.
Future trends projected by Coffman Associates.

Other revenue-generating opportunities include the expansion of the existing auto park, which provides long term storage of automobiles, trailers, and mobile homes. This area has been a consistent source of revenue for the airport over the past several years and should continue to be. Other large areas of land contained in the airport lease could also be developed for future sources of revenue. Long term aircraft storage would be a possible use providing a steady stream of income over long periods of time. Due to the weather patterns in the area, a small solar power station may be feasible at the airport. This option would not only provide power to the airport, reducing that expense, but excess power could be sold on the open market providing added revenue. Before installing solar panels at the airport, consideration must be given to the potential for glare or reflections from the panels that may be problematic to pilots in the area. Any or all of these options could provide a good source of revenue to the airport, but each should be studied in detail before being implemented to ensure the revenue will cover development costs in a reasonable amount of time.

SUMMARY

The best means for beginning the implementation of the recommendations contained within this master plan is to first recognize that planning is a continuous process that does not end with completion of the master plan. Rather, the ability to continuously monitor the existing and forecast status of airport activity must be maintained. The basic issues upon which this master plan is based will remain valid for several years. As such, the primary goal is for the airport to evolve into a facility that will best serve the air transportation needs of the region and to evolve into a self-supporting economic generator for Inyo County.

In this master plan, focusing on the timing of airport improvements was necessary; however, the actual need for facilities is more appropriately established by airport activity levels rather than a specified date. For example, projections have been made as to when to extend Runway 12-30, but in reality, the time frame in which additional facilities are needed may be substantially different. Actual demand may be slow in reaching forecast activity levels. On the other hand, an aggressive development schedule, or the beginning of scheduled air service, may dictate the extension be completed much sooner. Although every effort has been made to conservatively estimate when facility development will be needed, aviation demand will ultimately dictate when facility improvements need to be accelerated or delayed.

The real value of a usable master plan is that it keeps the issues and objectives in the mind of the user so that he or she is better able to recognize change and its effect. In addition to adjustments in aviation demand, decisions made as to when to undertake recommended improvements in this master plan will impact the period that the plan remains valid. The format used in this plan is intended to reduce the need for costly updates. Updating can be done by the user, improving the plan's effectiveness.

In summary, the planning process requires Inyo County staff to consistently monitor the progress of the airport in terms of total aircraft operations, total based aircraft, and overall aviation activity. Analysis of aircraft demand is critical to the exact timing and need for new airport facilities. The information obtained from continually monitoring airport activity will provide the data necessary to determine if the development schedule should be accelerated or decelerated.

Appendix A
GLOSSARY AND ABBREVIATIONS

Appendix A

GLOSSARY OF TERMS

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

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

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

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

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

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

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

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

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

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

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

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

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

ALERT AREA: see special-use airspace.

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

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

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

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

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

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

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

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

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

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

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

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

CLASS A AIRSPACE: see Controlled Airspace.

CLASS B AIRSPACE: see Controlled Airspace.

CLASS C AIRSPACE: see Controlled Airspace.

CLASS D AIRSPACE: see Controlled Airspace.

CLASS E AIRSPACE: see Controlled Airspace.

CLASS G AIRSPACE: see Controlled Airspace.

CLEAR ZONE: see Runway Protection Zone.

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

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

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

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

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

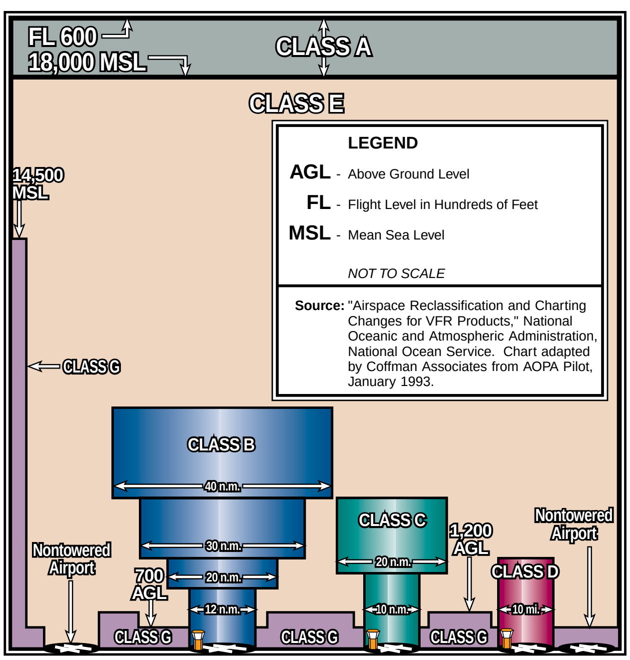
- *CLASS C:* generally, the airspace from the surface to 4,000 feet above the air port elevation (charted as MSL) surrounding those airports that have an operational control tower and radar approach control and are served by a qualifying number of IFR operations or passenger enplanements. Although individually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

- *CLASS D:* generally, that airspace from the surface to 2,500 feet above the air port elevation (charted as MSL) surrounding those airport that have an operational control tower. Class D air space is individually tailored and configured to encompass published instrument approach procedures.
  Unless otherwise authorized, all

persons must establish two-way radio communication.

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

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



CONTROLLED FIRING AREA: see special-use airspace.

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

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

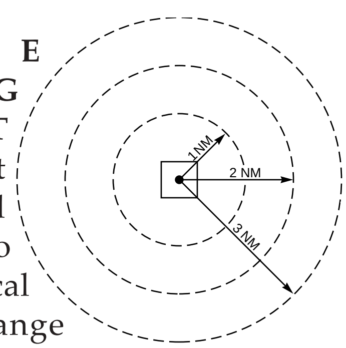
- *TAKEOFF RUNWAY AVAILABLE (TORA):* The runway length declared available and suitable for the ground run of an airplane taking off;

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

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

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

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



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

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

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

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

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

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

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

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

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

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

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

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

GLOBAL POSITIONING SYSTEM: See "GPS."

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

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

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

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

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

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

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

LANDING DISTANCE AVAILABLE (LDA): see declared distances.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

OPERATION: a take-off or a landing.

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

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

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

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

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

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

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

PROHIBITED AREA: see special-use airspace.

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

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

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

RESTRICTED AREA: see special-use airspace.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

STANDARD INSTRUMENT DEPARTURE (SID): a pre-planned IFR departure procedure.

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

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

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

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

TAKEOFF RUNWAY AVAILABLE (TORA): see declared distances.

TAKEOFF DISTANCE AVAILABLE (TODA): see declared distances.

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

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

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

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

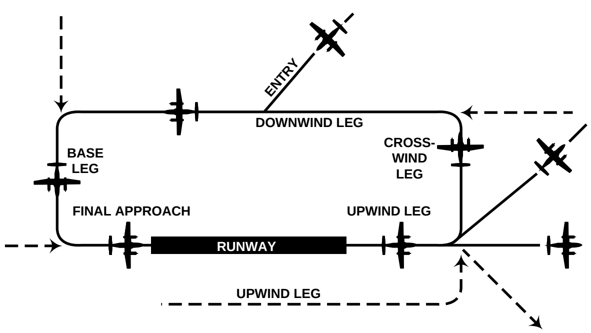
THRESHOLD: the beginning of that portion of the runway available for landing. In some instances the landing threshold may be displaced.

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

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

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

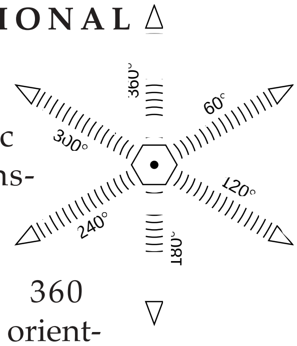
UNICOM: A nongovernment communication facility which may provide airport information at certain airports. Locations and frequencies of UNICOM's are shown on aeronautical charts and publications.



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

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

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



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

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

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

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

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

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

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

WARNING AREA: see special-use airspace.

ABBREVIATIONS

AC: advisory circular

ADF: automatic direction finder

ADG: airplane design group

AFSS: automated flight service station

AGL: above ground level

AIA: annual instrument approach

AIP: Airport Improvement Program

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

ALS: approach lighting system

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

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

APV: instrument approach procedure with vertical guidance

ARC: airport reference code

ARFF: aircraft rescue and fire-fighting

ARP: airport reference point

ARTCC: air route traffic control center

ASDA: accelerate-stop distance available

ASR: airport surveillance radar

ASOS: automated surface observation station

ATCT: airport traffic control tower

ATIS: automated terminal information service

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

AWOS: automated weather observation station

BRL: building restriction line

CFR: Code of Federal Regulations

CIP: capital improvement program

DME: distance measuring equipment

DNL: day-night noise level

DWL: runway weight bearing capacity for air

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craft with dual-wheel type landing gear

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

FAA: Federal Aviation Administration

FAR: Federal Aviation Regulation

FBO: fixed base operator

FY: fiscal year

GPS: global positioning system

GS: glide slope

HIRL: high intensity runway edge lighting

IFR: instrument flight rules (FAR Part 91)

ILS: instrument landing system

IM: inner marker

LDA: localizer type directional aid

LDA: landing distance available

LIRL: low intensity runway edge lighting

LMM: compass locator at middle marker

LOC: ILS localizer

LOM: compass locator at ILS outer marker

LORAN: long range navigation

MALS: medium intensity approach lighting system

MALSR: medium intensity approach lighting system with sequenced flashers

MALSR: medium intensity approach lighting system with runway alignment indicator lights

MIRL: medium intensity runway edge lighting

MITL: medium intensity taxiway edge lighting

MLS: microwave landing system

MM: middle marker

MOA: military operations area

MSL: mean sea level

NAVAID: navigational aid

NDB: nondirectional radio beacon

NM: nautical mile (6,076 .1 feet)

NPIAS: National Plan of Integrated Airport Systems

NPRM: notice of proposed rulemaking

ODALS:	omnidirectional approach lighting system
OFA:	object free area
OFZ:	obstacle free zone
OM:	outer marker
PAC:	planning advisory committee
PAPI:	precision approach path indicator
PFC:	porous friction course
PFC:	passenger facility charge
PCL:	pilot-controlled lighting
PIW:	public information workshop
PLASI:	pulsating visual approach slope indicator
POFA:	precision object free area
PVASI:	pulsating/steady visual approach slope indicator
RCO:	remote communications outlet
REIL:	runway end identifier lighting
RNAV:	area navigation
RPZ:	runway protection zone
RTR:	remote transmitter/receiver
RVR:	runway visibility range
RVZ:	runway visibility zone
SALS:	short approach lighting system
SASP:	state aviation system plan
SEL:	sound exposure level
SID:	standard instrument departure
SM:	statute mile (5,280 feet)
SRE:	snow removal equipment
SSALF:	simplified short approach lighting system with sequenced flashers
SSALR:	simplified short approach lighting system with runway alignment indicator lights
STAR:	standard terminal arrival route
SWL:	runway weight bearing capacity for aircraft with single-wheel type landing gear
STWL:	runway weight bearing capacity for aircraft with single-wheel tandem type landing gear
TAF:	Federal Aviation Administration (FAA) Terminal Area Forecast

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TACAN: tactical air navigational aid

TORA: takeoff runway available

TODA: takeoff distance available

TRACON: terminal radar approach control

VASI: visual approach slope indicator

VFR: visual flight rules (FAR Part 91)

VHF: very high frequency

VOR: very high frequency omni-directional range

VORTAC: VOR and TACAN collo-cated

Appendix B
ENVIRONMENTAL EVALUATION

Appendix B
ENVIRONMENTAL EVALUATION

Analysis of the potential environmental impacts of proposed airport development projects is an important component of the Airport Master Plan process. The primary purpose of this section is to evaluate the proposed development program for the Bishop Airport in order to determine whether proposed development actions could individually or collectively affect the quality of the environment.

A major component of this evaluation is coordination with appropriate federal, state, and local agencies to identify potential environmental concerns that should be considered prior to the design and construction of new facilities at the airport. Agency coordination consisted of a letter requesting comments and/or information regarding the proposed airport development. Issues of concern that were identified as part of this process are presented in the following discussion. The letters received from various agencies are included at the end of this Appendix.

Any major improvements planned for Bishop Airport will require compliance with the *National Environmental Policy Act (NEPA) of 1969*, as amended. For projects not "categorically excluded" under *FAA Order 5050.4A, Airport Environmental Handbook*, compliance with NEPA is generally satisfied by the preparation of an Environmental Assessment (EA). In instances where significant environmental impacts are expected, an Environmental Impact Statement (EIS) may be required. This evaluation is intended to supply a preliminary review of environmental issues associated with the proposed improvements.

This master plan and any major improvements will also be subject to the requirements of the *California Environmental Quality Act* (CEQA). Compliance with the act will require the preparation of either an Initial Study and/or an Environmental Impact Report, depending on anticipated environmental impacts.

PROPOSED DEVELOPMENT

As a result of the Airport Master Plan analysis, a number of airport improvements have been recommended for implementation over the long range planning horizon. The recommended master plan concept (Chapter Five) illustrates the development proposed during this period. Following is a list of the major projects planned for completion.

AIRSIDE DEVELOPMENT

- Extend Runway 12-30 by 900 feet to the northwest and 500 feet to the southeast.
- Construct a new full-length parallel taxiway on the south side of Runway 7-25 and extend the existing full-length parallel taxiway for Runway 12-30 to the ends of the new runway.
- Install a medium intensity approach light system (MALSR) with runway alignment lights on Runway 30.
- Install medium intensity lighting (MITL) on the taxiway extensions and the runway extension (MIRL).

LANDSIDE DEVELOPMENT

- Set land aside for a new commercial passenger terminal on the northwest side of Runway 12-30.
- Construct a new general aviation terminal on the existing ramp.
- Develop a series of new T-hangars and six new executive hangars on the southwestern edge of Runway 16-34.
- Expand the general aviation ramp area by 50,000 square yards along the south side of Runway 7-25.
- Develop seven new business lease parcels along the new ramp extension south of Runway 7-25.
- Relocate the two existing 12,000 gallon fuel tanks, located east of the existing terminal building, approximately 400 feet west onto the new ramp extension.
- Construct a long-term parking area south of the new general aviation terminal.

ACQUISITION

- Lease land on each end of Runway 12-30, to accommodate both the runway extensions and portions of the runway protection zone; on both ends of Runway 16-34; and on the east end of Runway 7-25.

OTHER POTENTIAL DEVELOPMENT

The master plan is also considering the development of a new fire station and several roadways to accommodate potential future commercial airport use.

ENVIRONMENTAL CONSEQUENCES - SPECIFIC IMPACTS

The following sections briefly examine the airport development actions and their potential to cause significant environmental impact. Each of the specific impact categories outlined in *FAA Order 5050.4A* are addressed.

NOISE

Aircraft sound emissions are often the most noticeable environmental effect an airport will produce on the surrounding community. If the sound is sufficiently loud or frequent in occurrence, it may interfere with various activities or otherwise be considered objectionable.

To determine potential noise related impacts that the proposed development could have on the environment surrounding Bishop Airport, noise exposure patterns were analyzed for both existing airport activity conditions and long-term forecasted conditions.

Noise Contour Development

The basic methodology employed to define aircraft noise levels involves the use of a mathematical model for aircraft noise predication. Within the State of California the CNEL (Community Noise Equivalent Level) metric is used. The CNEL metric accumulates the total noise occurring during a 24-hour period, with a 10 decibel weight applied to noise occurring between 10:00 p.m. and 7:00 a.m. A 4.77 decibel weight is also added for noise occurring between 7:00 p.m. and 10:00 p.m. The Federal Aviation Administration (FAA) and other federal agencies such as Housing and Urban Development (HUD) accept the CNEL metric for noise measurement within the State of California.

California law sets the standard for the acceptable level of aircraft noise for persons residing near airports as 65 CNEL (California Code of Regulations, Title 21, Chapter 2.5, Subchapter 6, Sections 5000 et seq.) Four types of land uses are defined as incompatible with noise levels above 65 CNEL: residences, schools, hospitals and convalescent homes, and places of worship. These land uses are regarded as compatible only if they have been insulated to assure an interior sound level, from aircraft noise, of 45 CNEL. They are also considered compatible if an avigation easement for the property has been obtained by the airport operator.

California noise insulation standards apply to new hotels, motels, apartment buildings and other dwellings, not including detached single family homes. The standards require that "interior noise levels attributable to outdoor sources shall not exceed 45 decibels (based on the DNL or CNEL metric) in any habitable room." (California Code of Regulations, Title 24, Part 2, Appendix Chapter 35.)

Noise Contour Lines

Since noise decreases at a constant rate in all directions from a source, points of equal CNEL noise levels are routinely indicated by means of a contour line. The various contour lines are then superimposed on a map of the airport and its environs. It is important to recognize that a line drawn on a map does not imply that a particular noise condition exists on one side of the line and not on the other as CNEL calculations do not precisely define noise impacts. Nevertheless, CNEL contours can be used to: (1) highlight existing or potential incompatibilities between an airport and any surrounding development; (2) assess relative exposure levels; (3) assist in the preparation of airport environs land use plans; and (4) provide guidance in the development of land use control devices, such as zoning ordinances, subdivision regulations, and building codes.

The noise contours for Bishop Airport have been developed from the Integrated Noise Model (INM), Version 6.0b. The INM was developed by the Transportation Systems Center of the U.S. Department of Transportation at Cambridge, Massachusetts, and has been specified by the FAA as the computer model acceptable for public use airports.

The INM is a model which accounts for each aircraft along flight tracks during an average 24-hour period. These flight tracks are coupled with separate tables contained in the database of the INM which relate to noise, distances, and engine thrust for each make and model of aircraft type selected.

Data input files for the noise analysis assumed implementation of the recommended development of the airport as identified on the recommended master plan concept. The input files contain operational data, runway utilization, aircraft flight tracks, and fleet mix as projected in this plan. For detailed information on the aviation forecasts for

Bishop Airport refer to Chapter Two, Aviation Demand Forecasts. Other inputs into the program include the runway use percentages and percentage of day and night operations. Basic assumptions used as input to the INM are presented in **Table A**.

The runway use percentages determined that the primary runway, Runway 12-30, was utilized by the majority of all aircraft. The primary use of Runway 12-30 is expected to continue through the planning period. It was assumed that 80 percent of the local traffic utilize Runway 12-30, 19 percent utilize Runway 16-34, and one percent utilizes Runway 7-25.

TABLE A
Noise Contour Input Data
Bishop Airport

	Runway Use Percentages					
Type of Operation	**7**	**25**	**12**	**30**	**16**	**34**
Single/Multi-engine	0.4%	0.6%	48.0%	32.0%	9.5%	9.5%
Helicopter	0.4%	0.6%	48.0%	32.0%	9.5%	9.5%
Turboprop, Business Jet	0.4%	0.6%	48.0%	32.0%	9.5%	9.5%

Day and Night Operation Percentage

Operation Type	**Day**	**Evening**	**Night**
Itinerant	85.00%	10.00%	5.00%
Local	85.00%	10.00%	5.00%

Noise Analysis Results

Output data selected for calculation by the INM were annual average noise contours in CNEL. As stated above, the 65 CNEL contour is the threshold of significant impact recognized by various federal agencies. Inyo County and the State of California also recognize the 65 CNEL as the threshold of significant impact. The 60 CNEL noise contour is provided to identify marginal effects from noise. No mitigation is required by the FAA within the 60 to 65 CNEL contour band, in accordance with NEPA guidelines.

- EXISTING NOISE CONDITION

Exhibit A illustrates the 2000 noise exposure at Bishop Airport. The 70 and 75 CNEL noise contours remain entirely within airport leased property. The majority of the 65 CNEL noise contour remains on leased airport property with the exception of a small portion on the southeast end of Runway 30. This area is undeveloped and considered a compatible use with the airport. The 60 CNEL, which is shown to identify areas of marginal impact, is mostly contained within leased airport property other than small areas off the ends of Runways 30, 34, and 12. **Table B** presents the number of acres affected by existing noise within each contour.

- FUTURE NOISE CONDITION

Exhibit B depicts the future noise contours expected to occur in the future after implementation of the proposed runway and taxiway improvements. The increase in the size of the contour lines is directly correlated to both the increase in the number and types of aircraft forecasted to use the airport once improvements have been completed. The acres of land affected by each of the contours is presented in **Table B.** As expected, the number of acres affected by each contour is greater than what currently exists at the airport.

The 70 and 75 CNEL noise contours remain entirely on airport property (pending the acquisition of additional leased property from the Los Angeles Department of Water and Power [LADWP].) The majority of the 65 DNL contour also remains on airport property once additional lease space has been acquired from the LADWP. The portions of the 65 DNL contour that do not lie within airport property are found on the ends of Runway 12-30. These areas are currently mined for aggregate or maintained as open space.

The 60 CNEL noise contour extends off airport property on all runways. The land uses affected by this contour are open space, mining operations, and natural areas - none of which are considered sensitive areas.

TABLE B
Contour Area (measured in acres)
Bishop Airport

	60 CNEL	65 CNEL	70 CNEL	75 CNEL
Existing Condition	254.5	99.0	33.0	12.6
Future Condition	416.7	223.2	99.7	34.5

COMPATIBLE LAND USE

Federal Aviation Regulations (F.A.R.) Part 150 recommends guidelines for land use compatibility within various levels of aircraft noise exposure as summarized on **Exhibit B**. As the name indicates, these are guidelines only; F.A.R. Part 150 explicitly states that determinations of noise compatibility and regulation of land use are purely local responsibilities.

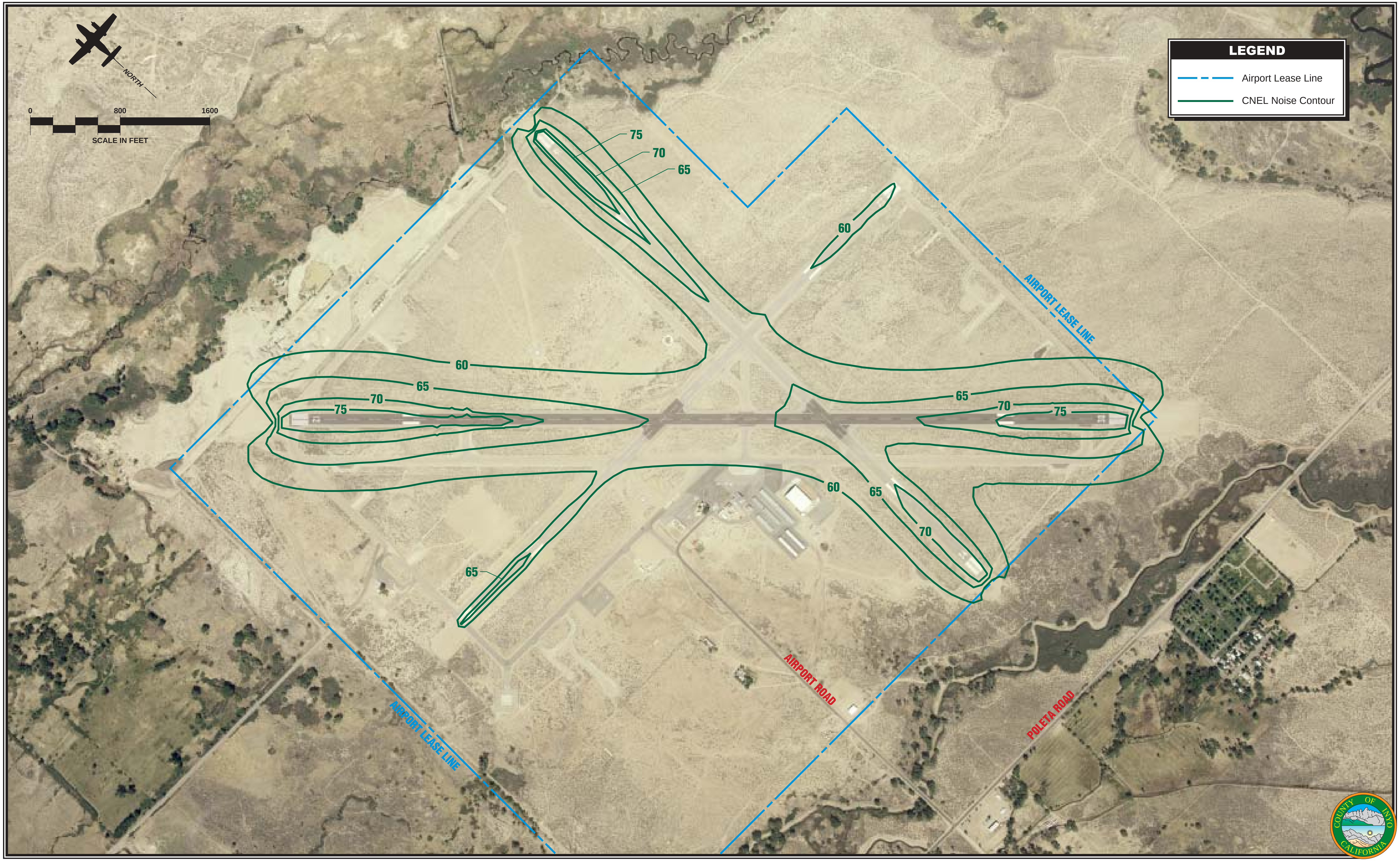

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Exhibit A
EXISTING AIRPORT NOISE EXPOSURE

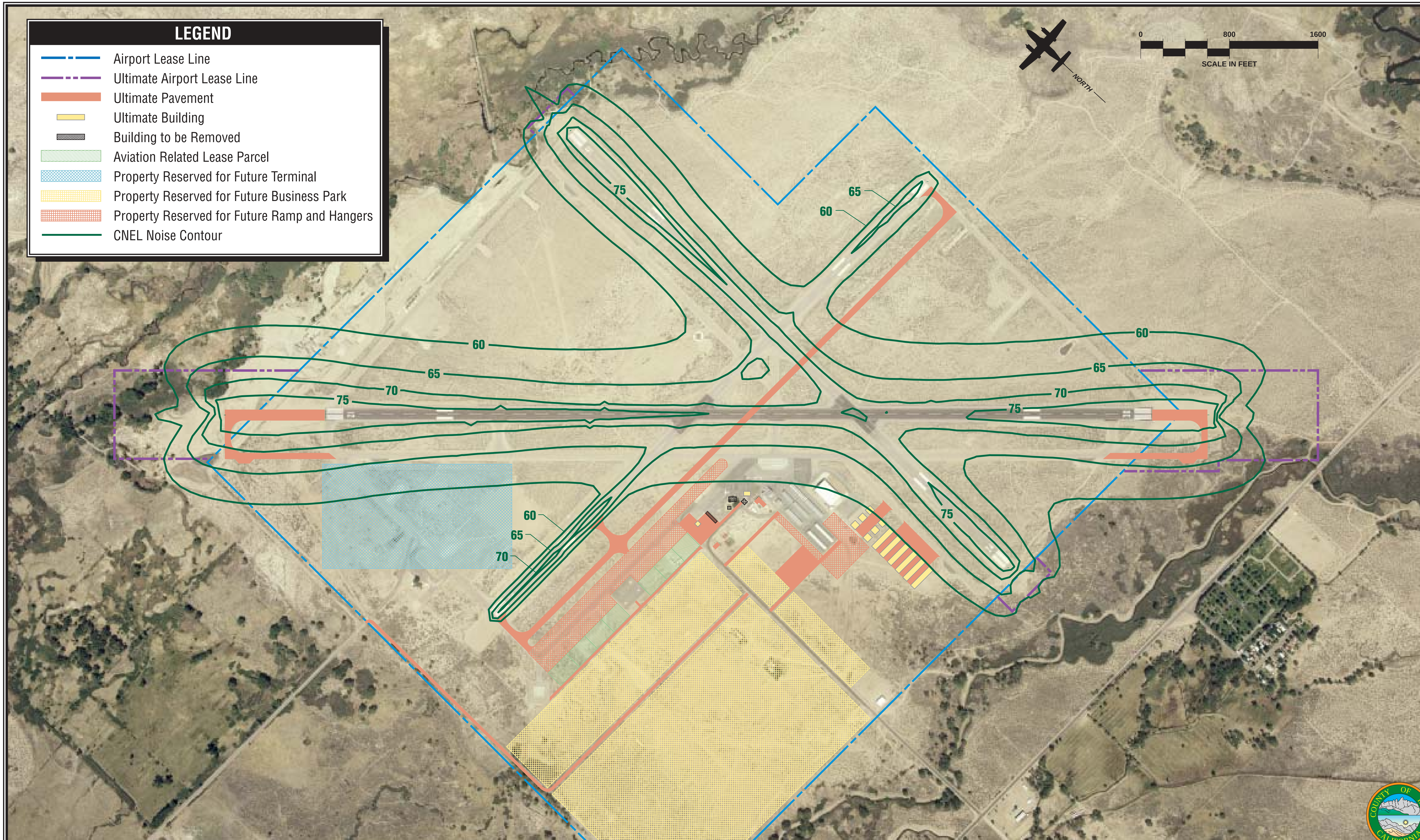

Exhibit B
ULTIMATE AIRPORT NOISE EXPOSURE

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Results of the noise modeling efforts indicate that the 60 and 65 CNEL noise contours are expected to extend beyond airport property; however, no residences or sensitive land uses exist within this contour. The *Land Use Element* of the *Inyo County General Plan* indicates that future use of the land surrounding the airport would remain in a compatible undeveloped state.

The *Airport Comprehensive Land Use Plan* was adopted by the Inyo County Airport Land Use Commission, in December 1991. This master plan is consistent with the policies contained within this comprehensive plan. This master plan is also consistent with the policies contained within the various elements of the *Inyo County General Plan*.

SOCIAL IMPACTS

Social impacts known to result from airport improvement projects are often associated with the relocation of residences or businesses, or other community disruptions. Development of the proposed improvements is not expected to result in the relocation or removal of any residence or business. The existing mining operation bordering airport property will not be affected by airport development and is expected to terminate within the next few years.

The proposed development and associated land acquisition are not anticipated to divide or disrupt an established community, interfere with orderly planned development, or create a short-term, appreciable change in employment. The land proposed for lease acquisition, as part of the airport development program, is undeveloped and is located at the ends of Runways 12, 16, 30, 34 and 25.

A comprehensive land use plan has been adopted for Bishop Airport. The project is consistent with the policies outlined in that plan.

INDUCED SOCIOECONOMIC IMPACTS

Induced socioeconomic impacts address those secondary impacts to surrounding communities resulting from the proposed development, including shifts in patterns of population movement and growth, public service demands, and changes in business and economic activity to the extent influenced by the airport development. According to *FAA Order 5050.4A*, “Induced impacts will normally not be significant except where there are also significant impacts in other categories, especially noise, land use or direct social impacts.”

Significant shifts in patterns of population movement or growth, or increased public service demands are not anticipated as a result of the proposed development. It is expected, however, that the proposed new airport development would potentially induce positive socioeconomic impacts for the community over a period of years. The airport, with expanded facilities and services, would be expected to attract additional users. It is expected to encourage tourism, industry, and trade to enhance the future growth and expansion of the community's economic base. Future socioeconomic impacts resulting from the proposed development would be expected to be primarily positive in nature.

AIR QUALITY

The U.S. Environmental Protection Agency (EPA) has adopted air quality standards that specify the maximum permissible short-term and long-term concentrations of various air contaminants. The National Ambient Air Quality Standards (NAAQS) consist of primary and secondary standards for six criteria pollutants which include: Ozone (O_3), Carbon Monoxide (CO), Sulfur Dioxide (SO_x), Nitrogen Oxide (NO_x), Particulate matter (PM_{10}), and Lead (Pb).

Primary air quality standards are established at levels to protect the public health from harm with an adequate margin of safety. Secondary air quality standards are established to protect crops, vegetation, wildlife, visibility and climate, as well as the effects of air pollution on materials, economic values, and personal comfort and well being. Secondary standards are set at levels necessary to protect the public health and welfare from any known or anticipated adverse affects of a pollutant. Air contaminants increase the aggravation and the production of respiratory and cardiopulmonary diseases.

Section 176(c) of the Clean Air Act Amendments of 1977 states, in part, that no federal agency shall approve any activity that does not conform to a State Implementation Plan after one has been approved. Currently a State Implementation Plan has been approved by the Environmental Protection Agency for the State of California. The airport is located in a region that has been assigned a state non-attainment designation for PM_{10}, which means that the area does not meet the state air quality standards for particulate matter. In 1998 the Great Basin Unified Air Pollution Control District prepared and adopted a State Implementation Plan to reduce unhealthful levels of PM_{10} within the study area.

Under NEPA, an air quality analysis will not be required for project implementation. According to *FAA Order 5050.4A, Airport Environmental Handbook* and *FAA-AAE-97-03 Air Quality Procedures for Civilian and Military Airports*, air quality analysis is only required if the state's indirect source review requirements are exceeded or, in instances where ISR thresholds have not been established, or airport operations are forecasted to exceed 180,000 annual operations and 1.3 million annual enplanements. Forecasted long-term operations are expected to be 47,200 and annual enplanement potential is expected to be 17,610 passengers. While not required under NEPA, it must be noted that an air quality analysis may be required to fulfill the requirements of CEQA for the State of California.

A permit may be required from the Great Basin Unified Air Pollution Control District prior to proposed construction.

WATER QUALITY

Water quality concerns associated with airport expansion most often relate to domestic sewage disposal, increased surface runoff and soil erosion, and the storage and handling of fuel, petroleum, and solvents, etc. Construction of the proposed improvements will result in an increase in impermeable surfaces and a resulting increase in surface runoff from both landside and airside facilities. During the construction phase, the proposed development may result in short-term impacts on water quality, particularly suspended sediments, during and shortly after precipitation events. Recommendations established in *FAA Advisory Circular 150/5370-10, Standards for Specifying Construction of Airports, Item P-156, Temporary Air and Water Pollution, Soil Erosion and Siltation Control* should be incorporated in project design specifications to mitigate potential impacts. These standards include temporary measures to control water pollution, soil erosion, and siltation through the use of fiber mats, gravel, mulches, slope drains, and other erosion control measures.

Spills, leaks, and other releases of hazardous substances into the local environment are often a concern at airports due to fuel storage, fueling activities, and maintenance of aircraft. Stormwater flowing over impermeable surfaces may pick up petroleum product residues and, if not controlled, transport them off-site. The most critical concern would be spills or leaks of substances that could filter through the soils and contaminate groundwater resources. Federal and state laws and regulations have been established to safeguard these facilities and activities. These regulations include standards for underground storage tank construction materials, the installation of leak or spill detection devices, and regulations for storm water discharge.

In accordance with Section 402(p) of the *Clean Water Act*, as added by Section 405 of the *Water Quality Act of 1987*, a *National Pollution Discharge Elimination System* (NPDES) General Permit is required from the Environmental Protection Agency. NPDES requirements apply to industrial facilities, including airports, and all construction projects that disturb one or more acres of land.

With regard to construction activities, the Bishop Airport and all applicable contractors will need to comply with the requirements and procedures of the NPDES General Permit, including the preparation of a *Notice of Intent* and a *Stormwater Pollution Prevention Plan*, prior to the initiation of project construction activities.

The construction program, as well as specific characteristics of project design, should incorporate best management practices (BMPs) to reduce erosion, minimize sedimentation, control non-stormwater discharges, and protect the quality of surface water features potentially affected. BMPs are defined as nonstructural and structural practices that provide the most efficient and practical mans of reducing or preventing pollution of stormwater. The selection of the practices at Bishop Airport should be based on the site's characteristics and focus on those categories of erosion factors within the contractor's control including: (1) construction scheduling, (2) limiting exposed areas, (3) runoff velocity reduction, (4) sediment trapping, and (5) good housekeeping practices. Inspections of the construction site and associated reporting may be required.

Impacts to water quality are anticipated to be less than significant as long as the proper permits are obtained and best management practices are incorporated into construction programs. Refer to the *Waters of the United States Including Wetlands* section of this evaluation for potential permit requirements.

DEPARTMENT OF TRANSPORTATION ACT, SECTION 4(f) LANDS

Paragraph 47e of *FAA Order 5050.4A* provides the following.

> *(7)(a) "Section 4(f) provides that the Secretary shall not approve any program or project which requires the use of any publicly-owned land from a public park, recreation area, or wildlife and waterfowl refuge of national, state or local significance, or any land from a historic site of national, state or local significance as determined by the officials having jurisdiction thereof unless there is no feasible and prudent alternative to the use of such land and such program includes all possible planning to minimize harm."*
>
> *7(b) "...When there is no physical taking but there is the possibility of use of or adverse impacts to Section 4(f) land, the FAA must determine if the activity associated with the proposal conflicts with or is compatible with the normal activity associated with this land. The proposed action is compatible if it would not affect the normal activity or aesthetic value of a public park, recreation area, refuge, or historic site. When so construed, the action would not constitute use and would not, therefore, invoke Section 4(f) of the DOT Act."*

A review of Section 4(f) lands was conducted and it was determined that no direct or indirect impacts to any Section 4(f) lands are anticipated as a result of project implementation. No Section 4(f) lands will be acquired for project implementation and no Section 4(f) lands are encompassed by the 65 CNEL noise contour.

HISTORICAL, ARCHITECTURAL, ARCHAEOLOGICAL AND CULTURAL RESOURCES

The California Historical Resources Information System (CHRIS) Eastern Information Center in Riverside, California and the Native American Heritage Commission were contacted regarding the potential presence of cultural resources within the proposed development area. Copies of the response letters received from these agencies are enclosed at the end of this Appendix.

In their response letter, CHRIS indicated that nine archaeological sites and one historical property have been recorded during past archaeological surveys on airport property. Two archaeological sites have also been recorded within a one-quarter mile radius of the project area. In addition, literature reviews indicated that portions of the project fall within a National Register District. An archaeological survey of proposed development, in areas not previously surveyed, was recommended in order to identify any potential cultural remains. It is likely that an archaeological survey would be required prior to the issuance of a categorical exclusion.

The Native American Heritage Commission response letter indicated that they had completed a record search of the sacred lands file. This search resulted in a "failure to indicate the presence of Native American cultural resources in the immediate project area." However, it was recommended that other sources of cultural resources information be contacted for information on potential known and recorded sites. Conversation with the Bureau of Indian Affairs determined that the Bishop Reservation would be the most likely source of further information. A follow-up letter to the Bishop Reservation was sent, but at the time of printing this master plan a response had not been received.

Should archaeological resources be encountered during any preconstruction or construction activities, work shall immediately cease in the area of discovery and the State Historic Preservation Officer be notified immediately pursuant to 36 CFR 800.11. A statement to this affect should be included in any contractual agreement for airport construction.

BIOTIC COMMUNITIES AND THREATENED AND ENDANGERED SPECIES OF FLORA AND FAUNA

As part of this evaluation, the U.S. Fish and Wildlife Service (FWS) and the California Department of Fish and Game were contacted to request information regarding potential impacts to biotic resources, threatened or endangered species, or species of special concern. An inquiry letter, project location map, and proposed layout diagram were sent to the agencies on June 18, 2001. As of the date of printing of this document, responses had not been received from the agencies. Inquiry telephone conversations with the biologists assigned to the project revealed that an excessive workload was precluding their timely response to the scoping letter. The following paragraphs will summarize the results of internet research conducted by the consultant.

Federally-Listed Species

A number of federally-listed threatened or endangered species occur within Inyo County. While it is unlikely that any of these species occur within the project site as most of the site has been previously disturbed, further consultation with the FWS will need to occur in order to comply with Section 7 consultation requirements. A Biological Assessment would be necessary to eliminate the presence of any of the listed species. Section 7 consultation must be completed prior to the issuance of federal clearances and/or permits such as a NPDES permit or a Section 404 permit. Listed species within Inyo County include the following.

Threatened
- Bald eagle *(haliaeetus leucocephalus)*
- Inyo brown towhee *(pipilo fuscus eremophilus)*
- Desert tortoise *(*gopherus agassizii)
- Lahontan cutthroat trout *(oncorhynchus clarki henshawi)*
- Fish slough milk-vetch *(astragulus lentiginosus var. piscinensis)*
- Spring-loving centaury *(centaurium namophilum)*
- Ash meadows gumplant *(grindelia fraxinopratensis)*

Endangered
- Amargosa vole *(microtis californicus scirpensis)*
- Southwestern willow flycatcher *(empidonax traillii extimus)*
- Least bell's vireo *(vireo bellii pusillus)*
- Owens tui chub *(gila bicolor snyderi)*
- Owens pupfish *(cyprinodon radiosus)*
- Amargosa niterwort *(nitrophila mohavensis)*
- Eureka Valley evening-primrose *(oenothera californica)*
- Eureka dine grass *(swallenia alexandrae)*

State-Listed Species

State-listed threatened and endangered species information is available on-line for only the state as a whole. County specific lists are available only though the Department of Fish and Game. As of the date of printing of this master plan, a response from the agency had not been received.

WATERS OF THE U.S. INCLUDING WETLANDS

The airport is bordered by the North Fork Bishop Creek to the north and Bishop Creek to the south. Neither of these rivers will be directly affected by the implementation of the proposed project; however, if dredge or fill material is to be discharged into either of the waters bordering the airport property, the Corps will need to be contacted regarding permit requirements.

Phone conversations with staff from the Los Angeles District of the Army Corps of Engineers indicated that the presence of wetlands within the proposed project area is unlikely; however, it was recommended that a site visit be conducted by a wetland biologist to confirm this. Wetlands may be present near the proposed construction, off airport property, near the northwest end of Runway 12-30. If wetlands are confirmed to be in this area, and these wetlands may be affected by construction, a U.S. Army Corps of Engineers permit will most likely be required.

FLOODPLAINS

According to Flood Insurance Rate Maps (FIRM) published by the Federal Emergency Management Agency (FEMA), two floodplains exist on airport property. Floodplains associated with the North Fork Bishop Creek are found along the northern portion of airport property. Small portions of floodplain associated with Bishop Creek are found on the southeastern edge of airport property. The extension of Runway 12 may directly impact the North Fork Bishop Creek floodplain. Proposed property acquisition at the ends of Runways 12, 16, and 30 would include floodplain areas; however, acquisition of property would have no affect on floodplain capacity at this time.

The extension of Runway 12 may be subject to restrictions to meet flood insurance requirements and local ordinances and permit restrictions would need to be reviewed to determine the regulatory requirements of constructing within or near a 100-year floodplain.

COASTAL MANAGEMENT PROGRAM AND COASTAL BARRIERS

The proposed development of Bishop Airport is not located within the jurisdiction of a State Coastal Management Program. The Coastal Zone Barrier resources system consists of undeveloped coastal barriers along the Atlantic and Gulf Coasts. These resources are outside of the sphere of influence of Bishop Airport and its vicinity, and do not apply to the proposed development.

No impact to coastal management areas or coastal barriers will occur with implementation of the proposed development program.

WILD AND SCENIC RIVERS

According to the National Park Service's list of Wild and Scenic Rivers, there are no wild or scenic rivers located within the vicinity of the proposed development. No impacts to wild and scenic rivers are anticipated as a result of airport development.

FARMLAND

Paragraph 16c of *FAA Order 5050.4A* states that if the proposed project involves the acquisition of farmland which will be converted to nonagricultural uses, it must be determined whether any of the acquired land is protected by the Farmland Protection Policy Act (FPPA). In the case of Bishop Airport, the FPPA would not be applicable. Review of the *Inyo County General Plan* and aerial photographs indicated that the land surrounding the airport is currently not used as agricultural land. A preliminary review of soils data for the project area determined that the area is not classified as prime or unique farmland; however, the NRCS did not respond to a request for comment on the proposed development plan. Impacts to prime or unique farmland are not anticipated.

ENERGY SUPPLY AND NATURAL RESOURCES

Electrical power is provided by Southern Cal Edison and water and sewer services are provided on-site with the use of a well and septic system. Propane service is provided by local suppliers. An increase in energy demand is anticipated as a result of project implementation; however, this increase is not expected to be large enough to have a dramatic affect on existing energy production facilities or energy resource supplies. Nevertheless, the current utility service to the airport would not be able to satisfy these increased needs; however, the airport recently received a grant for improvements to the current utility system. These improvements to the airport's antiquated electrical, water and sewer system are currently underway and were designed with future airport expansion in mind; therefore, no further changes will be required for project implementation.

LIGHT EMISSIONS

A variety of lighting aids are available at Bishop Airport to facilitate airport identification, approaches, and landings, both at night and during adverse weather conditions. A rotating beacon, projecting green and white light at 180-degree intervals, identifies the location of the airport at night. The beacon is located on the southwest side of the tiedown apron. Runway identification lighting has been installed on Runway 7-25 (medium intensity runway lighting) and on Runways 12-30 and 16-34 (high intensity runway lighting). Taxiway lighting has been installed along all parallel taxiways, as well as lighted airfield signs. Finally, a visual approach slope indicator is installed at both ends of Runway 16-34 and Runway 12-30. Bishop Airport also has pilot-controlled lighting which is used to automatically turn lighting systems on or off depending on pilot needs.

The installation of a medium intensity approach light system with runway alignment lights on Runway 30 and the installation of medium intensity lighting on the taxiway extensions and the runway extension are included in the proposed project. The installation of these lighting systems are not anticipated to have a negative effect on airport surroundings as the land surrounding the airport is primarily undeveloped.

SOLID WASTE IMPACT

The nearest landfill to the airport property is the Bishop-Sunland Landfill which services the community of Bishop. This landfill is located approximately three miles southwest of the airport along Highway 395. Increases in the amount of solid waste generated by the airport are expected as a result of the proposed development and overall growth in the aviation industry. These increases are not expected to place an undue burden on the existing landfill.

CONSTRUCTION IMPACTS

Construction activities have the potential to create temporary environmental impacts at an airport. These impacts primarily relate to noise resulting from heavy construction equipment, fugitive dust emissions resulting from construction activities, and potential impacts on water quality from runoff and soil erosion from exposed surfaces.

A temporary increase in particulate emissions and fugitive dust may result from construction activities. The use of temporary dirt access roads would increase the generation of particulates. Dust control measures, such as watering exposed soil areas, will need to be implemented to minimize this localized impact.

Any necessary clearing and grubbing of construction areas should be conducted in sections or sequenced to minimize the amount of exposed soil at any one time. All vehicular traffic should be restricted to the construction site and established roadways.

The provisions contained in *FAA Advisory Circular 150/5370-10, Standards for Specifying Construction of Airports, Temporary Air and Water Pollution, Soil Erosion, and Siltation Control* will be incorporated into all project specifications. During construction, temporary dikes, basins, and ditches should be utilized to control soil erosion and sedimentation and prevent degradation of off-airport surface water quality.

After construction is complete, slopes and denuded areas should be re-seeded to aid in the vegetation process.

The design and construction of the Proposed Action will need to incorporate BMPs to reduce erosion, minimize sedimentation, and control non-stormwater discharges, in order to protect the quality of surface water features on and off the airport.

SUMMARY

Based on a review of correspondence provided by state and federal agencies and various supporting information, potential environmental issues and considerations anticipated as a result of the development and operation of Bishop Airport are as follows:

Air Quality - Status of nonattainment with California air quality standards should be monitored and permits may be required prior to project construction.

Waters of the U.S. including Wetlands - A wetland survey should be conducted to determine the presence of wetlands on site.

U.S. DOT Act, Section 4(f) - Impacts to be further defined by results of historical/cultural resources survey.

Historical/Cultural Resources - Survey should be conducted by qualified archaeologists prior to any ground-disturbing activity and the results submitted to the CHRIS and SHPO.

Biotic Communities and Threatened and Endangered Species - Conduct biological survey to evaluate potential impacts to both native plant life and species within the project area.

As a result of the NEPA process, mitigation measures may be recommended to limit the potential impacts related to a number of these resources. Please note that as more specific information is gathered through a formal EA process, additional issues may arise.

CALIFORNIA HISTORICAL RESOURCES INFORMATION SYSTEM

Eastern Information Center
Department of Anthropology
University of California
Riverside, CA 92521-0418

Phone (909) 787-5745
Fax (909) 787-5409

July 6, 2001
RS# 2475

Molly A. Waller
Coffman Associates
237 N.W. Blue Parkway, Ste. 100
Lee's Summit, MO. 64063

Re: Cultural Resources Records Search for the Airport Master Plan for the Bishop Airport.

Dear Ms Waller:

We received your request on June 28, 2001 for a cultural resources records search for the project designated an Airport Master Plan for the Bishop Airport, located in Sections 4, 5, 9, 32, & 33, T.6S, 7S, R. 33E, MDBM, near the city of Bishop in Inyo County. We have reviewed our site records, maps, and manuscripts against the location map you provided.

Our records indicate that four cultural resources surveys have been conducted on small portions of the project area as part of other projects. The majority of the project area however, has not been examined for cultural resources. Nine archaeological sites and one historical property were recorded within the project boundaries as a result of the prior surveys. Our records also indicate that two archaeological sites have been recorded within a one-quarter mile radius of the project area.

In addition to the California Historical Resources Information System, the following were reviewed:

> The National Register of Historic Places Index (03/30/99): Portions of Project area fall within a National Register District, Primary number 14-5878.
>
> Office of Historic Preservation, Archaeological Determinations of Eligibility (listed through 08/23/00): Four of the sites previously recorded are within the project boundaries, CA-INY-1410, CA-INY-1411, CA-INY-1412 and CA-INY-1432, and are listed as contributors to the National Register District noted above.
>
> Office of Historic Preservation, Directory of Properties in the Historic Property Data File (dated 08/23/00): No historical properties are located within the project boundaries.

> A review of (1949) USGS Bishop topographic map indicated no historic structures/features present. The General Land Office plat maps for Inyo County are on file at UCLA.

Based on existing information, there is a potential of additional significant cultural resources being present, therefore, further archaeological study is recommended. The entire project area should be surveyed systematically by a qualified archaeologist to identify all cultural remains and provide further recommendations for their study and treatment prior to any grading or construction. Enclosed is a list of archaeological consultants. When an archaeologist has been selected to perform the above-recommended work, please provide him/her with a copy of this letter, the records search may then be completed by this office to the level required by the archaeologist . If this finalization of the search is completed within three months of the initial search, we will not charge the consultant the minimum-per-project fee.

This statement does not constitute a negative declaration of impact. This statement reports only known resources on or in the vicinity of the property in question. The presence of resources on the property cannot be ruled out until a systematic survey is conducted.

State and federal law requires that if any cultural resources are found during construction, work is to stop and the lead agency and a qualified archaeologist be consulted to determine the importance of the find and its appropriate management.

Sincerely,

Barbara Brewer

Barbara Brewer
Information Officer

Enclosure

STATE OF CALIFORNIA Gray Davis, Governor

NATIVE AMERICAN HERITAGE COMMISSION
915 CAPITOL MALL, ROOM 364
SACRAMENTO, CA 95814
(916) 653-4082
Fax (916) 657-5390
Web Site www.nahc.ca.gov

July 5, 2001

Molly A. Waller
Coffman Associates
237 N.W. Blue Parkway, Suite 100
Lee's Summit, MO 64063

RE: Proposed environmental evaluation for proposed improvements to Bishop Airport, Bishop, Inyo County

Sent By Fax: (816) 524-2575
Pages Sent: 2

Dear Ms. Waller:

A record search of the sacred lands file has failed to indicate the presence of Native American cultural resources in the immediate project area. The absence of specific site information in the sacred lands file does not indicate the absence of cultural resources in any project area. Other sources of cultural resources should also be contacted for information regarding known and recorded sites.

Enclosed is a list of Native Americans individuals/organizations who may have knowledge of cultural resources in the project area. The Commission makes no recommendation or preference of a single individual, or group over another. This list should provide a starting place in locating areas of potential adverse impact within the proposed project area. I suggest you contact all of those indicated, if they cannot supply information, they might recommend other with specific knowledge. A minimum of two weeks must be allowed for responses after notification.

If you receive notification of change of addresses and phone numbers from any these individuals or groups, please notify me. With your assistance we are able to assure that our lists contain current information. If you have any questions or need additional information, please contact me at (916) 653-4040.

Sincerely,

Rob Wood

Rob Wood
Associate Governmental Program Analyst

NATIVE AMERICAN CONTACTS
Inyo County
July 5, 2001

Big Pine Band of Owens Vallley
Cheryl Leube, Chairperson
P. O. Box 700 — Owens Valley Paiute -
Big Pine, CA 93513
(760) 938-2003
Fax: (760) 938-2942

Bishop Reservation
Monty Bengochia, Chairperson
50 Tu Su Lane — Paiute - Shoshone
Bishop, CA 93515
(760) 873-3584
Fax: (760) 873-4143

Fort Independence Community of Paiute
Vernon Miller, Chairperson
P.O. Box 67 — Paiute
Independence, CA 93526
(760) 878-2126
Fax: (760) 878-2311

Paiute-Shoshone /Lone Pine Community
Rachel Joseph, Chairperson
Box 747 — Paiute Shoshone
Lone Pine, CA 93545
(760) 876-1034
(760) 876-8302 Fax
lppsr@qnet.com E-mail

Owens Valley Paiute Shoshone Cutural Ctr.
Pat Howard, Co-Chairman
P.O. Box 1281 — Paiute
Bishop, CA 93515
(619) 873-4478

Antelope Valley Pauite Tribe
Bill Lovett, Chairperson
Camp Antelope #11 — Pauite
Coleville, CA 96107
(530) 495-2801

Washoe / Pauite of Antelop Valley
Westley Dick
P.O. Box 52 — Washoe / Pauite
Coleville, CA 96107

Antelope Valley Indian Community Coleville Paiutes
PO Box 87 — Washoe / Pauite
Coleville, CA 96107
(530) 495-2434
(530) 495-1885 FAX

Bishop Reservation
Alan Spoonhunter, Environmental Manager/Planner
50 Tu Su Lane — Paiute - Arapaho
Bishop, CA 93515
(760) 873-3076

This list is current only as of the date of this document.

Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and Section 5097.98 of the Public Resources Code.

This list is only applicable for contacting local Native Americans with regards to the cultural assessment for the proposed Environmental Evaluation for Proposed Improvements to Bishop Airport, Bishop, Inyo County.

X-From_: bhenderson@spl.usace.army.mil Fri Dec 14 19:25:57 2001
From: bhenderson@spl.usace.army.mil
To: mwaller@coffmanassociates.com
Subject: Bishop Airport Expansion
Date: Fri, 14 Dec 2001 17:21:18 -0800
X-Mailer: Internet Mail Service (5.5.2650.21)

Ms. Waller,

My apologies for not responding to your inquiry to the U.S. Army Corps of Engineers prior to this. You requested information from this agency regarding issues of concern pertaining to the expansion of the Bishop Airport in Bishop, Inyo County, California. This does not constitute our final word on this proposed project, but a brief review of the provided documentation and aerial photograph indicates most, if not all, of the project would be constructed outside of waters of the United States.

Obvious areas subject to Corps jurisdiction are along the northern and southern boundaries of the Airport Lease Line where streamcourses occur. Designation of existing and ultimate runway protection zones into theses areas do not trigger our review provided there is no discharge of fill material into areas subject to our jurisdiction. However, we do suggest that areas designated as "ultimate pavement" for the eastern and western extensions of Runway 12-30 be examined for potential wetlands related to the drainages that occur beyond the extensions. Furthermore, it appears there may be a very minor drainage that enters the southwestern corner of the "existing runway visibility zone" on the western side of the airport lease line near the area proposed as reserved for the future business park. This area should also be examined to determine if Corps jurisdiction may be invoked.

If any area subject to Corps jurisdiction is proposed for deposition of fill material or other substantive disturbance, this office should be contacted. With appropriate information, we could then determine with greater definition whether a Department of the Army permit would be necessary.

Thank you for the opportunity to provide this preliminary observation. If you have any further questions, please direct them to me at the address or number below, or by electronic mail.

Regards,

Bruce Henderson
Ventura Field Office
U.S. Army Corps of Engineers
805-585-2145
FAX 805-585-2154

Appendix C
NEW INSTRUMENT APPROACH PROCEDURES

Appendix 16. NEW INSTRUMENT APPROACH PROCEDURES

1. BACKGROUND. This appendix applies to the establishment of new authorized instrument approach procedures. For purposes of this appendix, an Instrument Approach Procedure (IAP) amendment or the establishment of a Global Positioning System (GPS) instrument procedure "overlaying" an existing authorized instrument procedure, does not constitute a new procedure. However, a significant reduction in minima would constitute a new procedure.

a. This appendix identifies airport landing surface requirements to assist airport sponsors in their evaluation and preparation of the airport landing surface to support new instrument approach procedures. It also lists the airport data provided by the procedure sponsor that the FAA needs to conduct the airport airspace analysis specified in FAA Order 7400.2, *Procedures for Handling Airspace Matters*. The airport must be acceptable for IFR operations based on an Airport Airspace Analysis (AAA), under FAA Order 7400.2.

b. FAA Order 8260.19, *Flight Procedures and Airspace*, reflects the contents of this appendix as the minimum airport landing surface requirements that must be met prior to the establishment of instrument approach procedures at a public use airport. This order also references other FAA requirements, such as a safety analysis to determine the need for approach lighting and other visual enhancements to mitigate the effects of a difficult approach environment. This is a consideration regardless of whether or not a reduction in approach minimums is desired. Airport sponsors are always encouraged to consider an approach lighting system to enhance the safety of an instrument procedure. In the absence of any identified benefits or safety enhancement from an approach light system, sponsors should at least consider installing lower cost visual guidance aids such as REIL or PAPI.

c. The tables provided in this appendix are for planning purposes only and should be used in conjunction with the rest of the document. All pertinent requirements within this AC and other FAA documents, as well as local siting conditions, ultimately will determine the lowest minimums obtainable.

2. INTRODUCTION. To be authorized a new instrument approach procedure, the runway must have an instrument runway designation. Instrument runways are runway end specific. The runway end designation is based on the findings of an AAA study (Refer to Order 7400.2). In addition, the instrument runway designation for the desired minimums must be depicted on the FAA-approved ALP. If not depicted, a change to the ALP is required. As part of the ALP approval process, the FAA will conduct an AAA study to determine the runway's acceptability for the desired minimums.

3. ACTION. The airport landing surface must meet the standards specified in tables A16-1 A through C, for each specified runway, direction and have adequate airspace to support the instrument approach procedure. When requesting an instrument procedure, the sponsor must specify the runway direction, the desired approach minimums, whether circling approach procedures are desired, and the survey needed to support the procedure. For all obligated National Plan of Integrated Airport Systems (NPIAS) airports, the sponsor must also provide a copy of the FAA-approved ALP showing the instrument procedure(s) requested. An ALP is also recommended for all other airports.

4. DEFINITIONS.

a. Precision Approach. An instrument approach procedure providing course and vertical path guidance conforming to ILS, or MLS, precision system performance standards contained in ICAO annex 10. Table A16-1A defines the requirements for ILS, LAAS, WAAS, MLS, and other precision systems.

b. Approach Procedure with Vertical Guidance (APV). An instrument approach procedure providing course and vertical path guidance that does not conform to ILS or MLS system performance standards contained in ICAO annex 10, or a precision approach system that does not meet TERPS alignment criteria. Table A16-2B defines the requirements for WAAS and authorized barometric VNAV.

c. Nonprecision Approach. An instrument approach procedure providing course guidance without vertical path guidance. Table A16-3C defines the requirements for VOR, NDB, LDA, GPS (TS0-129) or other authorized RNAV system.

Table A16-1A. Precision Instrument Approach Requirements.

Visibility Minimums[1]	<3/4 statute mile	< 1-statute mile
Height Above Touchdown[2]	200	
TERPS Glidepath Qualification Surface (GQS)[3]	Clear	
TERPS precision "W" surfaces [4]	Clear	See Note 5
TERPS Paragraph 251	34:1 Clear	20:1 Clear
Precision Object Free Area (POFA) 200 x 800[6]	Required	Not Required
Airport Layout Plan[7]	Required	
Minimum Runway Length	4,200 ft (1,280 m) (Paved)	
Runway Markings (See AC 150/5340-1)	Precision	Non Precision
Holding Position Signs & Markings (See AC 150/5340-1 and AC 150/5340-18)	Precision	Non Precision
Runway Edge Lights[8]	HIRL / MIRL	
Parallel Taxiway [9]	Required	
Approach Lights[10]	MALSR, SSALR, or ALSF	Recommended
Runway Design Standards; e.g., Obstacle Free Zone (OFZ) [11]	< 3/4-statute mile approach visibility minimums	≥ 3/4-statute mile approach visibility minimums
Threshold Siting Criteria To Be Met [12]	Appendix 2, Paragraph 5g Criteria	Appendix 2, Paragraph 5f Criteria
Survey Required (see Table 16-2)	Line 9	Line 8

1. Minimums are subject to application of FAA Order 8260.3 (TERPS) and associated orders.
2. The Height Above Touchdown (HAT) indicated is for planning purposes only. Actual obtainable HAT may vary.
3. The Glidepath Qualification Surface (GQS) is applicable to approach procedures providing vertical path guidance. It limits the magnitude of penetration of the obstruction clearance surfaces overlying the final approach course. The intent is to provide a descent path from DA to landing free of obstructions that could destabilize the established glidepath angle. The GQS is centered on a course from the DA point to the runway threshold. It's width is equal to the precision "W" surface at DA, and tapers uniformly to a width 100 feet from the runway edges. If the GQS is penetrated, vertical guidance instrument approach procedures (ILS/MLS/WAAS/LAAS/Baro-VNAV) are not authorized
4. The "W" surface is applicable to precision approach procedures. It is a sloping obstruction clearance surface (OCS) overlying the final approach course centerline. The surface slope varies with glidepath angle. The "W" surface must be clear to achieve lowest precision minimums. Surface slope varies with glide path angle, 102/angle; e.g., for optimum 3° glide path 34:1 surface must be clear.
5. If the W surface is penetrated, HAT and visibility will be increased as required by TERPS.
6. This is a new airport surface (see paragraph 307). 250-foot minimum HAT is required without POFA.
7. An ALP is only required for airports in the NPIAS; it is recommended for all others.
8. Runway edge lighting is required for night minimums. High intensity lights are required for RVR-based minimums.
9. A parallel taxiway must lead to the threshold and, with airplanes on centerline, keep the airplanes outside the OFZ.
10. To achieve lower visibility minimums based on credit for lighting, a TERPS specified approach light system is required.
11. Indicates what chart should be followed in the related chapters of this document.
12. Circling procedures to a secondary runway from the primary approach will not be authorized when the secondary runway does not meet threshold siting (reference Appendix 2), OFZ (reference paragraph 306) criteria, and TERPS paragraph 251 criteria.

Table A16-1B. Approach Procedure With Vertical Guidance (APV) Approach Requirements (LNAV/VNAV)

Visibility Minimums[1]	< 3/4-statute mile	< 1-statute mile	1-statute mile	>1-statute mile
Height Above Touchdown[2]	250	300	350	400
TERPS Glidepath Qualification Surface (GQS)[3]	Clear			
TERPS Paragraph 251	34:1 clear	20:1 clear	20:1 clear, or penetrations lighted for night minimums (See AC 70/7460-1)	
Precision Object Free Area (POFA) 200 x 800[4]	Required	Not Required		
Airport Layout Plan[5]	Required			
Minimum Runway Length	4,200 ft (1,280 m) (Paved)	3,200 ft (975 m)[6] (Paved)	3,200 ft(975 m)[6,7]	
Runway Markings (See AC 150/5340-1)	Precision	Nonprecision[7]		Visual (Basic)[7]
Holding Position Signs & Markings(See AC 150/5340-1 and AC 150/5340-18)	Precision	Nonprecision		
Runway Edge Lights[8]	HIRL / MIRL		MIRL/LIRL	
Parallel Taxiway [9]	Required		Recommended	
Approach Lights[10]	MALSR, SSALR, or ALSF	Recommended		
Runway Design Standards; e.g., Obstacle Free Zone (OFZ) [11]	<3/4-statute mile approach visibility minimums	≥ 3/4-statute mile approach visibility minimums		
Threshold Siting Criteria To Be Met [12]	Appendix 2, Paragraph 5g Criteria	Appendix 2, Paragraph 5f Criteria	Appendix 2, Paragraph 5 a,b,c,d,e Criteria	
Survey Required (see Table 16-2)	Line 7	Line 6	Line 6	Line 6

1. Minimums are subject to the application of FAA Order 8260.3 (TERPS) and associated orders.
2. The Height Above Touchdown (HAT) indicated is for planning purposes only. Actual obtainable HAT may vary.
3. The Glidepath Qualification Surface (GQS) is applicable to approach procedures providing vertical path guidance. It limits the magnitude of penetration of the obstruction clearance surfaces overlying the final approach course. The intent is to provide a descent path from DA to landing free of obstructions that could destabilize the established glidepath angle. The GQS is centered on a course from the DA point to the runway threshold. It's width is equal to the precision "W" surface at DA, and tapers uniformly to a width 100 feet from the runway edges. If the GQS is penetrated, vertical guidance instrument approach procedures (ILS/MLS/WAAS/LAAS/Baro-VNAV) are not authorized
4. This is a new airport surface (see paragraph 307).
5. An ALP is only required for obligated airports in the NPIAS; it is recommended for all others.
6. Runways less than 3,200' are protected by 14 CFR Part 77 to a lesser extent (77.23(a)(2) is not applicable for runways less than 3200 feet). However runways as short as 2400 feet could support an instrument approach provided the lowest HAT is based on clearing any 200-foot obstacle within the final approach segment.
7. Unpaved runways require case-by-case evaluation by regional Flight Standards personnel.
8. Runway edge lighting is required for night minimums. High intensity lights are required for RVR-based minimums.
9. A parallel taxiway must lead to the threshold and, with airplanes on centerline, keep the airplanes outside the OFZ.
10. To achieve lower visibility minimums based on credit for lighting, a TERPS specified approach light system is required.
11. Indicates what chart should be followed in the related chapters in this document.
12. Circling procedures to a secondary runway from the primary approach will not be authorized when the secondary runway does not meet threshold siting (reference Appendix 2), OFZ (reference paragraph 306) and TERPS paragraph 251 criteria.

Table A16-1C. Nonprecision Approach Requirements

Visibility Minimums[1]	< 3/4-statute mile	< 1-statute mile	1-statute mile	>1-statute mile
Height Above Touchdown [2]	300	350	400	450
TERPS Paragraph 251	34:1 clear	20:1 clear	20:1 clear or penetrations lighted for night minimums (See AC 70/7460-1)	
Precision Object Free Area (POFA) 200 x 800[3]	Required	Not Required		
Airport Layout Plan[4]	Required			
Minimum Runway Length	4,200 ft (1,280 m) (Paved)	3,200 ft (975 m)[5] (Paved)	3,200 ft (975 m)[5,6]	
Runway Markings (See AC 150/5340-1)	Precision	Nonprecision[6]		Visual (Basic)[6]
Holding Position Signs & Markings (See AC 150/5340-1 and AC 150/5340-18)	Precision	Nonprecision		
Runway Edge Lights[7]	HIRL / MIRL		MIRL / LIRL	
Parallel Taxiway [8]	Required		Recommended	
Approach Lights[9]	MALSR, SSALR, or ALSF Required	Required [10]	Recommended	
Runway Design Standards, e.g. Obstacle Free Zone (OFZ)[11]	<3/4-statute mile approach visibility minimums	≥ 3/4-statute mile approach visibility minimums		
Threshold Siting Criteria To Be Met [12]	Appendix 2, Paragraph 5g Criteria	Appendix 2, Paragraph 5f Criteria	Appendix 2, Paragraph 5 a,b,c,d,e Criteria	
Survey Required (see Table 16-2)	Line 5	Line 4	Line 3	Line 3 Line 2

1. Minimums are subject to the application of FAA Order 8260.3 (TERPS) and associated orders.
2. The Height Above Touchdown (HAT) indicated is for planning purposes only. Actual obtainable HAT may vary.
3. This is a new airport surface (see paragraph 307).
4. An ALP is only required for obligated airports in the NPIAS; it is recommended for all others.
5. Runways less than 3,200' are protected by 14 CFR Part 77 to a lesser extent. However runways as short as 2400 feet could support an instrument approach provided the lowest HAT is based on clearing any 200-foot obstacle within the final approach segment.
6. Unpaved runways require case-by-case evaluation by regional Flight Standards personnel.
7. Runway edge lighting is required for night minimums. High intensity lights are required for RVR-based minimums.
8. A parallel taxiway must lead to the threshold and, with airplanes on centerline, keep the airplanes outside the OFZ.
9. To achieve lower visibility minimums based on credit for lighting, a TERPS specified approach lighting system is required.
10. ODALS, MALS, SSALS, SALS are acceptable.
11. Indicates what chart should be followed in the related chapters in this document
12. Circling procedures to a secondary runway from the primary approach will not be authorized when the secondary runway does not meet threshold siting (reference Appendix 2), OFZ (reference paragraph 306), and TERPS paragraph 251 criteria.

Table A16-2. Survey Requirements for Instrument Approach Procedures:

The Table indicates the acceptable runway obstruction survey needed to support an instrument approach procedure.

		Runway Survey Type								
	Approach	None	AV	BV	ANP	C	SUPLC	D	ANAPC	PIR
1	Night Circling			X	X	X	X	X	X	X
2	Non-Precision Approach ≥ 1SM, Day Only	X	X	X	X	X	X	X	X	X
3	Non-Precision Approach ≥ 1SM				X	X	X	X	X	X
4	Non-Precision Approach ≤ 1SM					X	X	X	X	X
5	Non-Precision Approach < ¾ SM								X	X
6	NPV Approach ≥ ¾ SM							X	X	X
7	NPV Approach < ¾ SM								X	X
8	Precision CAT I Approach ≤ 1SM							X	X	X
9	Precision CAT I Approach < ¾ SM								X	X
10	Precision CAT II Approach									X
11	Precision CAT III Approach									X

Note:
An "X" in each column for a given Approach (1 through 11) denotes a survey that is acceptable to support that approach. As shown, multiple surveys may support the approach, however the "X" farthest to the left indicates the minimum survey needed.

Runway survey types from FAA No. 405, Standards for Aeronautical Surveys and Related Products:

- **AV -** FAR77 Visual Approach - Utility runway, includes approach and primary surfaces only.
- **BV -** FAR77 Visual Approach, includes approach and primary surfaces only.
- **ANP -** FAR77 Nonprecision Approach - Utility runway, includes approach and primary surfaces only.
- **C -** FAR77 Nonprecision Approach - Visibility minimums greater than 3/4 mile includes approach and primary surfaces only.
- **SUPLC -** C Approach underlying a BV approach, includes approach and primary surfaces only.
- **D -** FAR77 Nonprecision Approach - Visibility minimums as low as 3/4 mile includes approach and primary surfaces only.
- **ANAPC -** Area Navigation Approach - Precision, conventional landing, includes approach, primary, transition, and missed approach surfaces.
- **PIR -** FAR77 Precision Instrument Approach, includes approach and primary surfaces only.

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