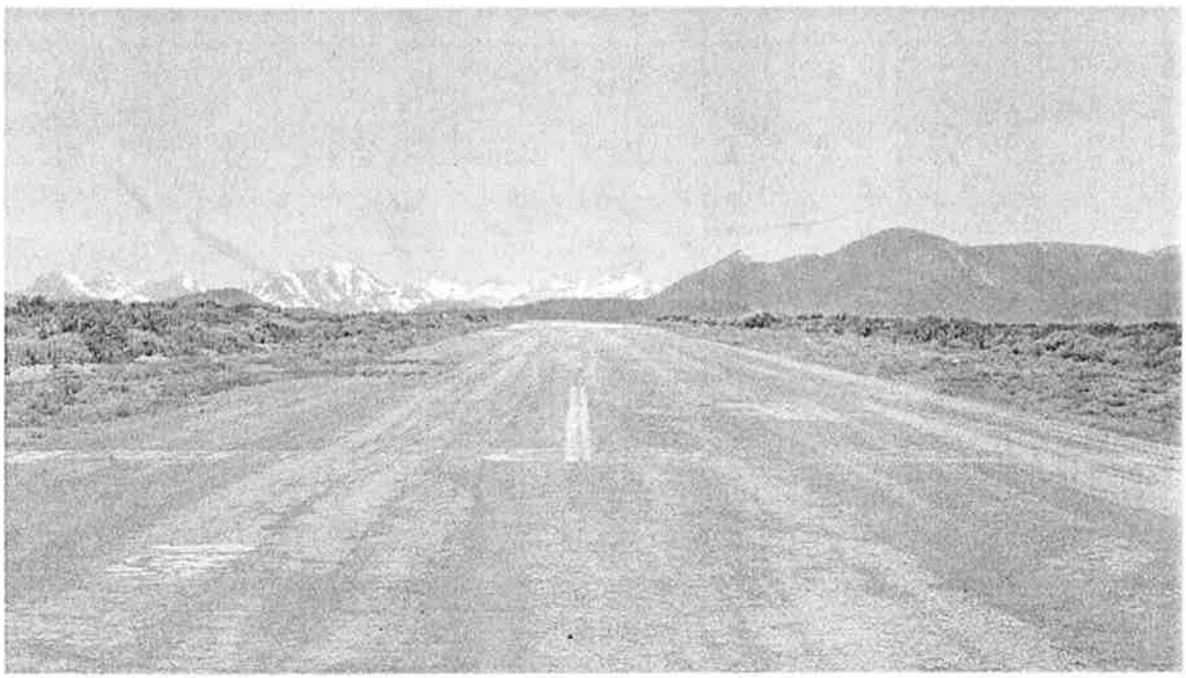
LEE VINING AIRPORT

MASTER PLAN / 2020



A COUNTY OF MONO AVIATION FACILITY

OCTOBER 2002

WADELL ENGINEERING CORPORATION

AIRPORT PLANNING □ ENGINEERING □ MANAGEMENT CONSULTANTS

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1. SUMMARY

Mono County, California contracted with Wadell Engineering Corporation to prepare a general aviation airport master plan study for Lee Vining Airport in Lee Vining, California. The basic intent of the study is to evaluate existing airport facilities, to assess airport demand, and to prepare an airport master plan to accommodate the demand through the year 2020. This summary presents the objectives of the study, the approach utilized in the master planning process, the results of the analyses performed, and the recommendations for prudent and proper protection and development of the Lee Vining Airport. This report is intended to be a useful technical document to allow the elected county officials, county staff, FAA, and California Aeronautics Program staff to properly develop and protect the airport while enhancing its usefulness to the traveling public.

Study Objectives

Specific objectives of the study are to:

- Determine, in concert with statewide planning criteria, a set of forecasts and facility requirements for the development of the airport.

- Provide concise and descriptive planning information. The impact and logic of the recommendations can then be clearly understood by the community and public agencies charged with the approval and development of this plan.

Study Approach

This Master Plan covers the planning period of 2000-2020 and includes the following major components:

- Inventory of airport facilities.

- Forecasts of aviation demand, including the number of operations, aircraft types, and aircraft mix.

- Determination of facilities and improvements required to satisfy the forecast demand.

- Estimation of the cost of airport development and operations.

- Recommendation of a plan for the ultimate development of the airport in accordance with community goals and increases in aviation demand.

This study becomes effective only after it has been evaluated, adopted, and implemented. The plan has been designed to accommodate changes in community goals and aviation trends as they develop, imparting flexibility into the planning process. Agencies contacted during the course of the study include representatives of Mono County, California Aeronautics Program, and the Federal Aviation Administration. Valuable points of view regarding the future of aviation in the area were generated through these contacts and are reflected in the study.

Findings

The Lee Vining Airport is located in Lee Vining, California, just east of the town center. It is a small general aviation facility occupying 68.98 acres on a land lease from the City of Los Angeles. The airport has one paved runway serving single and twin-engine aircraft, as well as occasional turboprops.

Presently, one aircraft is based at the airport. The total is expected to increase to 4 by the year 2010. Growth will occur in single engine piston aircraft and in transient operations. Runway operations will increase from 2,000 to 2,667 by the year 2020, all of which will be general aviation.

To meet increasing aviation demand, additional facilities and reconstruction of existing facilities will be necessary throughout the planning period. The existing 4,095-foot runway is not adequate to handle the small aircraft users. While a runway extension to 5,760-feet total length is desirable to meet FAA standards, only 4,940 feet can be achieved on the site due to earthwork costs.

Airport plans depicting the airfield area, terminal area, and approaches to the airport and stage development plans depicting the capital improvement program were prepared and are included at the end of this document. The plans explain how the needs of Lee Vining Airport can be met through the year 2020.

Stage I

The objectives of the first stage of development, 0-5 years, are (1) preparation of an environmental assessment under NEPA and CEQA, (2) expanded land lease for property additions, (3) perimeter fencing and card access control gate, (4) AVGAS fuel farm (5) replacement, widening and extension of the runway with parallel taxiway and lighting systems, (6) apron expansion, (7) hangars with taxiways, and (8) automatic weather observation system.

The Capital Improvement Program Cost Summary Table shows that the most significant expenditures during the 20-year capital improvement program occur in Stage I. These expenditures are needed for the replacement of the runway, taxiway and apron pavement and lighting systems to meet FAA standards.

Stage II

The second stage of development, 6-10 years, includes development of a large county-owned aircraft maintenance hangar and terminal facilities.

Stage III

The third stage of development, 11-20 years, primarily concerns pavement seal coating and marking.

The capital improvement program cost summary associated with the three stages of development is shown in the following table.

Capital Improvement Program Cost Summary
Lee Vining Airport
(In 2001 $)

Stage I (2000-2005)	$3,473,000
Stage II (2006-2010)	$1,000,000
Stage III (2011-2020)	$ 120,000
Total	$4,593,000
FAA/State Funds	$3,253,635
Local Funds	$1,339,365
Total	$4,593,000

Source: Wadell Engineering Corporation

The FAA grant program provides 90% grant funding for eligible projects and state aeronautics offers a 5% match to the FAA grant. The projects that are not eligible are auto parking, hangar construction, and private facilities such as fixed base operators, hangars, and fueling systems.

A 20-year cash flow analysis was prepared to model the income and expense. The resulting operating profit or loss was combined with the local share of funds to match FAA and State grants for development and construction of non-eligible facilities.

Recommendations

It is recommended that Mono County adopt the Lee Vining Airport Master Plan, 2000-2020, and undertake the following steps:

- Use the Master Plan as County policy for development on and adjacent to Lee Vining Airport.
- Apply to the Federal Aviation Administration and the State of California for environmental assessment and construction grants for facility expansion at the Lee Vining Airport.
- Implement the development program at the Lee Vining Airport.
- Apply for State of California aviation fund loans or municipal leasing funds for hangars, and develop revenue-producing aviation facilities at the airport to generate matching funds for future airport development and maintenance grants.
- Adopt new height zoning ordinances and zoning protection for the Lee Vining Airport in accordance with its role described in the Master Plan.

2. INVENTORY

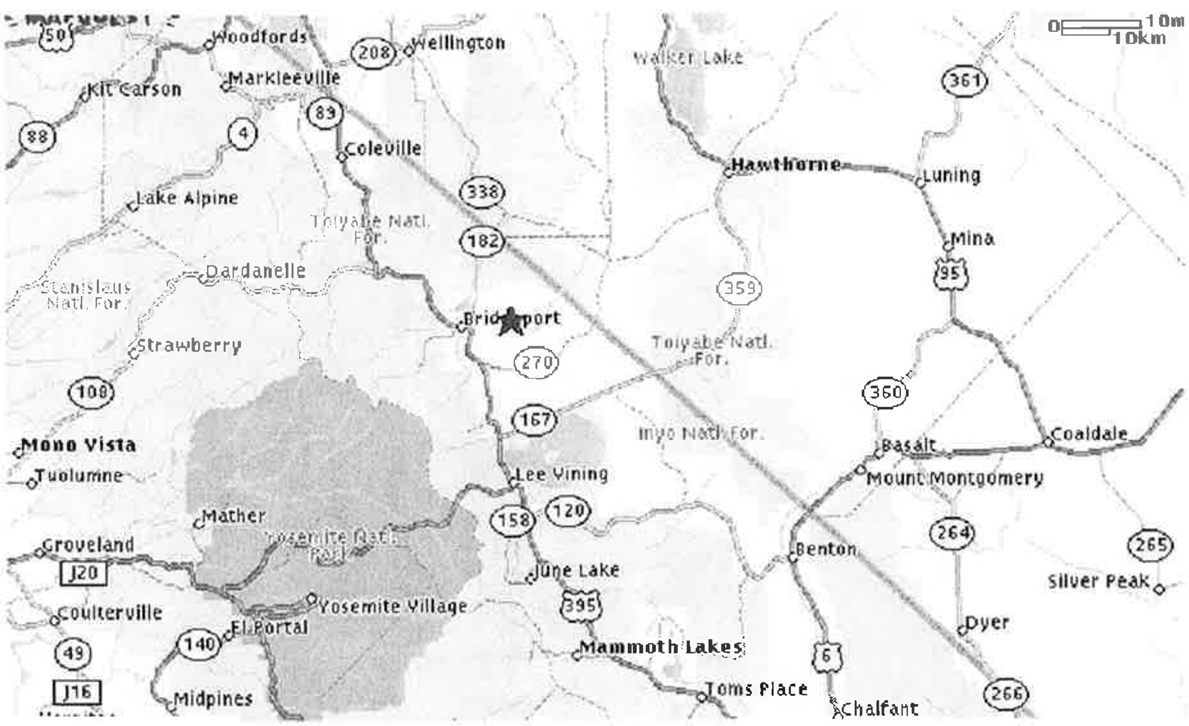
The inventory is prepared to provide a description of the airport location and setting, the history of the airport and the existing facilities.

Location and Setting

Mono County is located approximately 300 miles north of Los Angeles along the east slope of the Sierra Nevada mountain range. Mono County is bordered by Inyo County to the south, Alpine County to the north, Tuolumne, Mariposa, and Madera Counties to the west, and the state of Nevada abuts the majority of Mono County's eastern border. The topography ranges from high mountainous peaks in the western part of the County to deserts of sagebrush and pinion pine to the east. The County is 3,103 square miles in size with approximately 5, 750 people living in the unincorporated area, and approximately 7,100 people living in the only incorporated town in the County, the Town of Mammoth Lakes, which encompasses approximately twenty-five square miles. Data obtained from the State of California Department of Finance indicates an annual population growth rate of around 2% for the County over a nine-year period from 1990-1999.

Lee Vining is located at the easterly edge of Yosemite National Park and overlooks Mono Lake. The airport is along Highway 395 and near State Highways 167 and 120. Lee Vining is the eastern entrance to the national park.

Exhibit 1: Location Map
Lee Vining Airport



Airport History

The Lee Vining Airport is located on approximately 59 acres leased from the City of Los Angeles. The facility was developed in the early 1950's. An Airport Permit was issued to the County of Mono in 1956 for operation of a Basic Utility I airport with a runway length of 4,050 feet.

The first lease agreement with the City of Los Angeles was executed in March 1961 for approximately 24 acres. In 1962, a paved runway of 35' x 1,260' was constructed in the center of the 70' x 3250 graveled landing strip. In August 1965, the County lease was expanded to a total of approximately 54 acres, which widened the airport area to 400' x 5,200' with the clear zones widened beyond the lease boundaries. A third addition to the lease area was obtained in February 1968 for 5 acres adjacent the southwest corner, for aircraft tiedowns and hangars.

In 1966, the paved runway area was enlarged to 50' x 4,040'. Plans for a 900' paved extension to the north have been considered, but were never funded. Fencing of the airport lease land was completed in October 1971.

Power was extended approximately one mile underground in 1985, when taxiway and radio controlled runway lighting was installed.

In July 2001 the entire runway, taxiway, apron and short entrance road were repaved with 3 inches of asphaltic concrete and paint marked using county funds and a state aeronautics grant for the runway only.

This master plan provides for updating of key information to take Lee Vining into the new millennium.

Aviation Facilities

Aviation facilities inventoried include the airfield area, the terminal area, and the airspace / navigational facilities.

Airfield Area

The existing Lee Vining Airport is comprised approximately 59 acres of leased land with one paved runway. The runway and the runway approaches are described below.

Runways

The existing airfield at the airport consists of the following runway:

Table 1
Runway Characteristics
Lee Vining Airport

Runway	Orientation	Dimensions	Effective Gradient	Composition
15-33	N-S	4,095' x 50'	1.172%	Asphalt

Source: Wadell Engineering Corporation.

The terminal and hangar areas are located at the southwest end of the airport. Runway 15-33 has medium intensity edge lights. The runway, taxiway, and apron pavements are rated excellent due to the recent overlay. The estimated runway pavement gross weight strengths for aircraft with various landing gear configurations as follows:

Table 2
Pavement Strength
Lee Vining Airport

Runway	Single Wheel	Dual Wheel	Dual Tandem Wheel
15-33	30,000 lbs.	N/A	N/A

Source: FAA Airport Master Record #5010 for the Lee Vining Airport, December 1999.

Runway Approaches and Obstructions

The existing approach slope ratios (horizontal: vertical) for each runway end are as follows:

Table 3
Runway Approach Slopes
Lee Vining Airport

Runway End	Approach Slope
15	50+:1
33	50+:1

Source: FAA Airport Master Record #5010 for the Lee Vining Airport, December 1999.

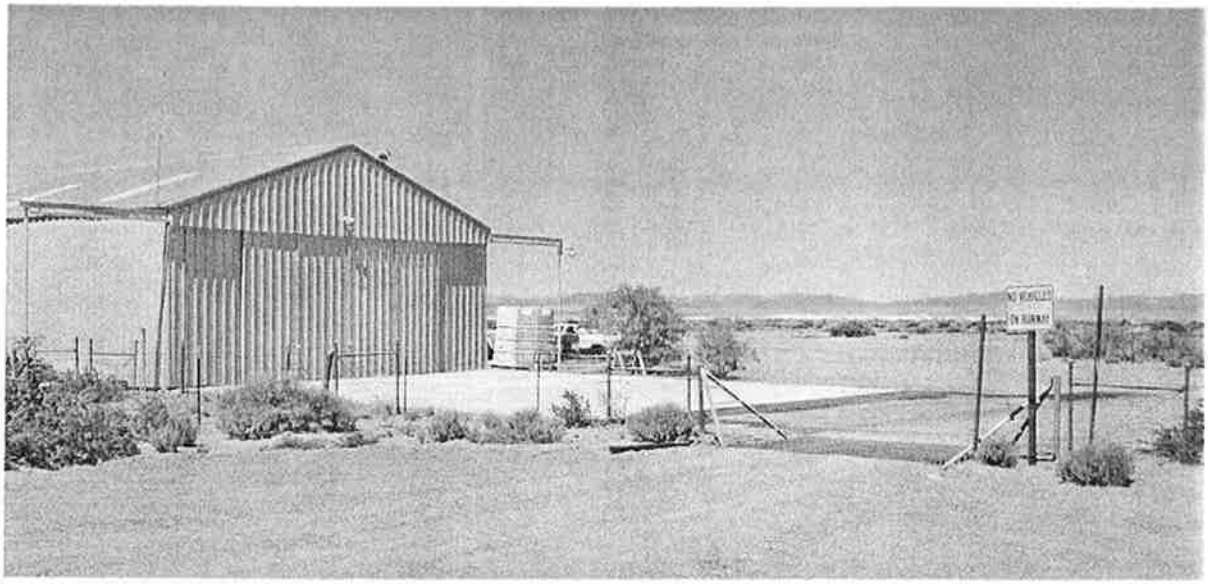
Exhibit 2: Airport Photomap
Lee Vining Airport

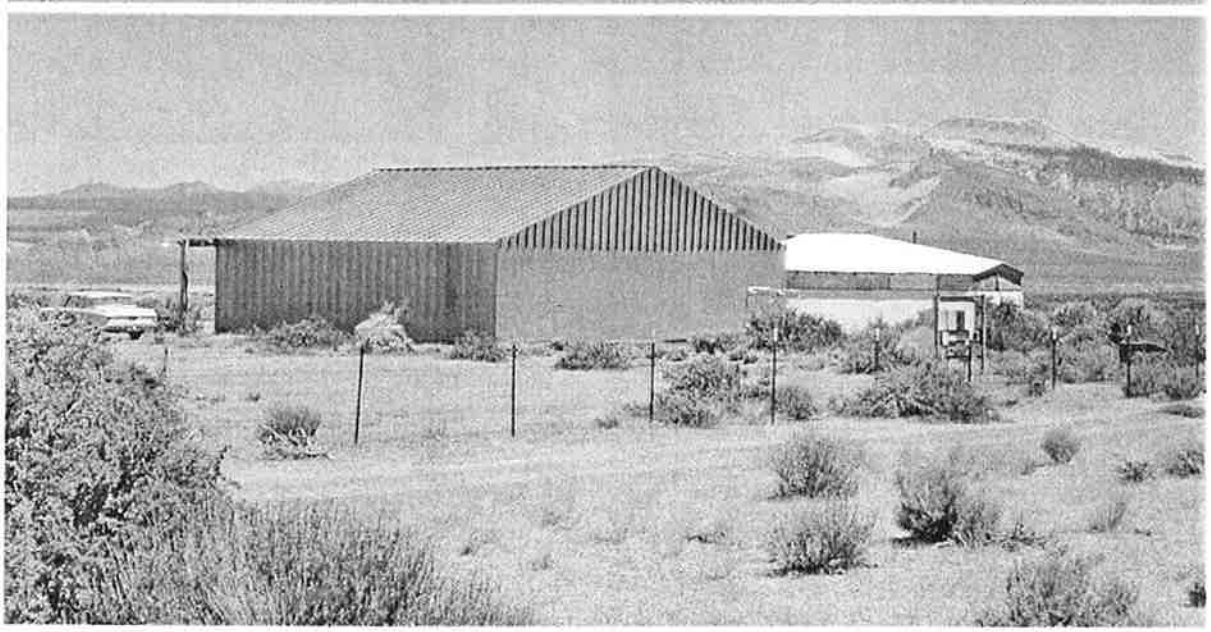
Source: Wadell Engineering Corporation May 2000 Photomapping

Terminal Area

The general aviation area, located at the southwest end of the airport, consists of three privately owned hangars and a 90' by 300' asphalt aircraft parking apron accommodating 7 tiedown spaces. The runway / apron taxiway is 22 feet wide. A short paved access road connects the gravel entrance road with the apron.

Exhibit 3: Terminal Area Photographs
Lee Vining Airport





Source: Wadell Engineering Corporation

Airspace/Navigational Facilities

The airport has visual approaches and utilizes a standard left-hand pattern to runway 15 and a non-standard right hand pattern to runway 33. The patterns altitude is set at 7,602 feet MSL (802 feet AGL). The traffic pattern should be raised to 1,000 feet above the airport, or 7,800 feet MSL.

The runway has displaced thresholds of 200 feet on the 33 end and 100 feet on the 15 end in order to establish a partial extended runway safety area. The airport has no instrument approach procedures. There are no on-site navigational aids.

3. AVIATION FORECASTS

The area served by Lee Vining Airport is designated in this report as the airport service area. Geographical boundaries for airport service areas consist of a city, county, or other governmental subdivision. Trends in aviation demand correspond with local growth trends in the governmental entity containing the main concentration of population served by an airport. Lee Vining Airport is strategically located to serve general aviation demand in Lee Vining and the surrounding parts of Mono County as well as offer an easterly entrance to Yosemite National Park. This area represents the airport service area for Lee Vining.

Aviation Trends

General aviation flying can be divided into four major categories:

- Business: The use of an aircraft for executive or business transportation. This category includes (1) aircraft used by a corporation or other organization and operated by professional pilots to transport its employees/property (not for compensation or hire), and (2) aircraft used by an individual for transportation required by a business in which he is engaged.

- Commercial: The use of an aircraft for commercial purposes (other than the certificated air carriers) in three types of activity: (1) air taxi, involving any use of an aircraft by the holder of an air taxi operating certificate; (2) aerial application, such as the distribution of chemicals (cropdusting); and (3) industrial special, such as pipeline patrol survey, advertising, and photography.

- Instructional: The use of an aircraft for flight training under an instructor's supervision.

- Personal: The use of an aircraft for personal reasons similar to the utilization of an automobile.

At the outset of the forecasting process, it is important to recognize the overall impact of general aviation on the nation's economy as well as anticipated growth in general aviation through future years. FAA statistics of current activity as well as forecasts through 2012 identify an increasing trend in general aviation growth.

General aviation includes a multitude of diverse and growing uses of aircraft, ranging from flying for sheer enjoyment to transportation of personnel by business firms in privately owned aircraft to highly specialized uses such as cropdusting, patrol, and aerial photography.

Aircraft Activity

General observation of the activity at Lee Vining indicates that it is not busy, except on some summer weekends. However, as with most non-towered airports, aircraft operations have not been counted.

It is estimated that 25% of current operations are local and 75% itinerant. The vast majority of operations are by single-engine aircraft at Lee Vining Airport, although some are by twins and occasional turboprops.

Table 4
National Active General Aviation Aircraft
By Type of Aircraft
FY 2001 - FY 2012
(In Thousands)

	2001	2012
Fixed Wing		
Piston		
Single Engine	152.9	164.8
Multi-Engine	21.2	21.2
Subtotal	174.1	186.0
Turbine		
Turboprop	5.8	6.6
Turbojet	7.8	12.3
Subtotal	13.6	18.9
Rotary Wing	7.9	9.5
Experimental	21.0	21.4
Other	6.9	7.5
Total	223.5	246.0

Source: FAA Forecasts, Fiscal Years 2001-2012, March 2001. Rounding by Wadell Engineering Corporation.

Based Aircraft

An airport plan is primarily developed from aviation demand forecasts. The California Aeronautics Program and the FAA through the National Plan of Integrated Airports System (NPIAS) provide information. To receive federal aid, airports must be in the NPIAS. The 1999 NPIAS shows that there are 3 aircraft based at Lee Vining. The state forecasts show 4 based aircraft and 2,667 total operations in the year 2020.

Aviation Forecasts

For purposes of this study, forecasts were prepared for based aircraft and annual operations from 2000 through the year 2020. The forecast, as presented in Table 5, provides detailed information concerning the determination of mix for runway capacity analyses, the types of based aircraft for future apron and hangar parking requirements, the number of instrument operations for determination of instrument approach capabilities and needs, and the aircraft operations by type for use in airport noise analyses. All of the based aircraft will be single engine. It is expected that occasional turboprop aircraft would make transient flights to Lee Vining for business and tourism reasons.

The forecast of aircraft operations is by type of operation, type of aircraft, and type of user. The local aircraft movements include touch-and-go training activity as well as flights in the immediate airport environs. The remaining aircraft movements are classified as itinerant, which includes flights that have origins and/or destinations away from the airport.

Table 5
Aircraft and Operations Forecast
Lee Vining Airport
2000-2020

	2000	2005	2010	2015	2020
Based Aircraft:					
Single Engine	1	3	4	4	4
Multi Engine	0	0	0	0	0
Helicopter	0	0	0	0	0
Turboprop	0	0	0	0	0
Turbine	0	0	0	0	0
Total	1	3	4	4	4
Annual Aircraft Operations:					
By Type of Operation					
Local	500	500	667	667	667
Itinerant	1,500	1,500	2,000	2,000	2,000
Total	2,000	2,000	2,667	2,667	2,667
By Type of Aircraft					
Single-engine prop.	2,000	2,000	2,667	2,667	2,667
Multi-engine prop.	0	0	0	0	0
Helicopter	0	0	0	0	0
Turboprop	0	0	0	0	0
Turbine	0	0	0	0	0
Total	2,000	2,000	2,667	2,667	2,667
By Type of User					
Military	0	0	0	0	0
Air Taxi	0	0	0	0	0
General Aviation	2,000	2,000	2,667	2,667	2,667
Total	2,000	2,000	2,667	2,667	2,667
Aircraft Operations Distribution					
Peak Month	300	300	400	400	400
Peak Week	80	80	100	100	100
Average Day of Peak Month	10	10	13	13	13
Peak Hour of Average Day of Peak Month	2	2	2	2	2
Instrument Operations Demand	80	80	100	100	100
Approach Demand	20	20	30	30	30

Source: Wadell Engineering Corporation

The instrument operations noted in Table 5 include instrument approaches (when aircraft arrive at the airport under instrument conditions using navigational aids) and instrument departures, which are the primary portion of the instrument operations.

Typically there are more instrument departures than instrument approaches at general aviation airports since the instrument approach is a more precise operation and usually occurs when arriving at a destination where it is necessary to let down to the airfield through cloud conditions or fog. Instrument departures most often involve a climb-out from the airport during instrument conditions when visual flight rule conditions exist on top of the clouds. There are currently no published instrument approach procedures for the Lee Vining Airport; therefore the numbers reflect potential demand, not actual operations.

4. AVIATION REQUIREMENTS

Demand/capacity analysis and facility requirements are based on guidelines established in FAA Advisory Circulars, FAA Regulations, and good planning and engineering judgment. Facility requirements are matched with the forecast of aviation demand to provide for the safe, efficient, and convenient utilization of the airport without unreasonable delays. It should be recognized that on the basis of demand, this chapter merely identifies items and quantities for input to the Airport Plans section of the report (Chapter 5). Actual recommended development is identified in the Implementation Plans section (Chapter 6), where all of the physical and financial aspects of the proposed development are brought together.

Aircraft/Airport Classifications

Airports are planned and developed to serve certain categories of existing and future user aircraft. In order to select appropriate dimensional standards, it is necessary to identify the various categories and design groups of aircraft.

Aircraft Approach Category

An aircraft approach category is a grouping of aircraft based on an approach speed of 1.3 V_{so}. V_{so} is the aircraft stall speed at the maximum certificated landing weight. V_{so} and the maximum certificated landing weight are established for the aircraft by the certificating authority of the country of registry. The aircraft approach categories are presented in Table 6.

Table 6
Aircraft Approach Category

Category	Approach Speed
A	Less than 91 knots
B	91 knots or more but less than 121 knots
C	121 knots or more but less than 141 knots
D	141 knots or more but less than 166 knots
E	166 knots or more

Airplane Design Groups

The airplane design groups table categorizes airplanes by wingspan and is presented below.

Table 7
Airplane Design Groups

Group	Wingspan
I	Up to but not including 49 feet (15 m)
II	49 feet (15 m) up to but not including 79 feet (24 m)
III	79 feet (24 m) up to but not including 118 feet (36 m)
IV	118 feet (36 m) up to but not including 171 feet (52 m)
V	171 feet (52 m) up to but not including 214 feet (65 m)
VI	214 feet (65 m) up to but not including 262 feet (80 m)

Source: FAA Advisory Circular 150/5300-13.

Airport Types

Airport types describe the operational and physical characteristics of the airplanes intended to operate at an airport. The airport reference code (ARC) is a system developed by the FAA which utilizes aircraft approach category and airplane design group components to assist in the design of critical airport elements meeting the requirements of the airplanes anticipated to use the aviation facilities.

Transport airports are designed, constructed, and maintained to serve airplanes in aircraft approach categories C and D, while utility airports serve the smaller airplanes in aircraft approach categories A and B. The latter airplanes are commonly used for personal and business flying, and for commuter and air taxi operations. The airport types are presented in Table 8.

Lee Vining Airport serves mostly A-I aircraft and occasional B-1 aircraft. It is a basic utility stage I facility.

Table 8
Airport Types

Type	Description
Basic Utility--Stage I	This type of airport serves about 75 percent of the single-engine and small twin-engine airplanes used for personal and business purposes. Precision approach operations are not usually anticipated. This airport is designed for small airplanes in airport reference code B-I.
Basic Utility--Stage II	This type of airport serves all the airplanes of Stage I, plus some small business and air taxi-type twin-engine airplanes. Precision approach operations are not usually anticipated. This airport is also designed for small airplanes in airport reference code B-I.
General Utility--Stage I	This type of airport serves all small airplanes. Precision approach operations are not usually anticipated. This airport is also designed for airplanes in airport reference code B-II.
General Utility--Stage II	This type of airport serves large airplanes in aircraft approach category A and B and usually has the capability for precision approach operations. This airport is normally designed for airplanes in airport reference code B-III.
Transport	This type of airport serves all large airplanes in aircraft approach categories C and D.

Source: FAA Advisory Circular 150/5300-13.

Airport Service Role

Lee Vining Airport is classified in the NPIAS as a basic utility general aviation airport, which serves aircraft with approach speeds up to but not including 91 knots (Category A). On occasion the airport receives transient turboprops. The airport should continue to be developed as a basic utility stage I airport handling A-I aircraft.

Airfield Capacity

Airfield facilities were evaluated for their ability to satisfy forecast aviation demand at the airport. Hourly runway capacities and annual service volume were estimated. Hourly runway capacity is defined as the maximum number of aircraft operations that can take place in one hour for given conditions. Annual service volume is a measure of annual aircraft operations that can be used as a reference in preliminary airfield planning.

The aviation forecasts along with the operations levels were evaluated. The airfield layout and operational use was determined from the Airport Layout Drawing and observations of airfield operations.

Runway Use

Runway use encompasses the number, location, and orientation of active runways, as well as the directions and types of operations using each runway. Runway use depends primarily on wind direction and wind speed, but also depends on other factors such as air traffic control rules and noise abatement procedures, runway instrumentation, taxiing distance, and runway length. It is estimated that Runway 33 is used 90% of the time, and Runway 15 is used 10% of the time.

Airspace and Air Traffic Control

Lee Vining Airport has no on-airport navaids. Oakland Center has been delegated responsibility for control of instrument flight rules (IFR) aircraft within this area. The overall airspace of Lee Vining Airport is unrestricted. There is no need for an on-site air traffic control facility.

The two types of flight rules for specific weather conditions are visual flight rules (VFR) and instrument flight rules (IFR). The definitions of these conditions are:

VFR: Ceiling is at least 1,000 feet and visibility is at least 3 miles
IFR: Ceiling is below 1,000 feet and/or visibility is below 3 miles

There is no weather data to establish the percentage of VFR versus IFR conditions.

Aircraft Mix

Aircraft mix is composed of four aircraft classifications: A, B, C, and D. Class A includes small single-engine aircraft (weighing 12,500 pounds or less); Class B includes small twin-engine aircraft (weighing 12,500 pounds or less); Class C includes large aircraft weighing more than 12,500 pounds and up to 300,000 pounds; and Class D includes heavy aircraft weighing more than 300,000 pounds. No Class C and D aircraft utilize Lee Vining Airport.

Hourly Runway Capacity

Hourly runway capacity is the maximum number of aircraft operations that can take place in one hour for given conditions. Factors that affect hourly runway capacity include:

- Runway use
- Airspace and air traffic control
- Ceiling and visibility conditions
- Aircraft mix

Estimated hourly runway capacities, together with peak hour demand for the planning period, are as follows:

Table 9
Hourly Runway Capacity
Lee Vining Airport

	2000	2010	2020
VFR peak hourly demand	2	3	3
VFR peak hourly capacity	40	60	60
IFR peak hourly demand	0	0	0
IFR peak hourly capacity	0	0	0

Source: Wadell Engineering Corporation

Annual Service Volume

Annual service volume is based on hourly capacities for the airfield operating conditions that occur throughout the year and on monthly, daily, and hourly variations in aircraft operations. The estimated annual service volume and the forecast annual demand levels are as follows:

Table 10
Annual Service Volume
Lee Vining Airport

Year	Annual Service Volume	Annual Demand
2000	215,000	2,000
2010	215,000	2,667
2020	215,000	2,667

Source: Wadell Engineering Corporation

Lee Vining Airport capacity exceeds aviation demand throughout the planning period.

Facility Requirements

An airport is composed of major elements, which contribute to its overall size and shape. The principal components include:

- AIRFIELD
  - Runways
  - Taxiways
  - Visual Aids/Lighting
- TERMINAL AREA
  - Airplane Parking and Tiedown
  - Buildings and Hangars
  - Roads and Auto Parking
  - Support Facilities
- LAND AREA REQUIREMENTS

This section discusses the facilities required to accommodate the forecast aviation demand. Each of the major facility requirement categories noted above is described separately. The facility requirements are summarized in tabular form at the end of this chapter.

Airfield

The airfield requirements analysis is prepared to determine future needs for the runway, taxiway, and visual aids/lighting systems. These requirements relate the extent and type of development necessary to accommodate the forecast demand and the capacity required of the airfield system.

Runways

Analysis of the runway system involves a determination as to necessary runway length, strength, orientation, and markings.

Runway Length

Runway length is determined analytically by evaluating the elevation of the airport above mean sea level and the design temperature, which is the mean of the maximum temperature during the hottest month of the year. The design elevation is 6,800 feet. An assumed critical temperature of 84 degrees F was used to prepare the runway length requirements table.

The Transport or business jet runway length requirements are based on aircraft size and useful load carried. The 75 percent level of business jet fleet includes all business jets weighing up to 30,000 pounds, typically the smaller business jets. The 100 percent fleet includes the largest planes up to 90,000 pounds, such as the Gulfstream V.

Runway Strength

The runway strength requirement is determined by the airport runway category and type of aircraft anticipated to operate at the airport. The runway pavement strength of runway 15-33 is 30,000 pounds single wheel gear configuration, which more than adequately meets the standards required for the type of operation expected at the airport.

Table 11
Runway Length and Strength Requirements
Lee Vining Airport

Airport Classification	Runway Length	Runway Strength*
Existing Airport		
Runway 15-33	4,095 ft.	30,000 # S
Basic Utility Stage I	5,760 ft.	8,000 # S
Basic Utility Stage II	8,170 ft.	8,000 # S
General Utility Stage I	8,170 ft.	12,500 # S
General Utility Stage II	8,170 ft.	30,000 # S
Transport**		
75%/60%	7,820 ft.	30,000 # S
75%/90%	9,050 ft.	30,000 # S
100%/60%	11,450 ft.	60,000 # D
100%/90%	11,450 ft.	60,000 # D

* "S" is pounds of single wheel gear configuration load; "D" is pounds of dual wheel load.
** First percent is aircraft size within business jet fleet; second percent is amount of useful load carried.

Source: Wadell Engineering Corporation

The majority of activity involves single-engine aircraft and light twin-engine aircraft. A preferred runway length would be 5,760 feet, yet the site is limited to 4,940 feet without extensive earthwork filling.

Runway Orientation

The configuration of the airport is determined by the number and orientation of the runways. The primary factors related to the number of runways required are airfield capacity and demand.

One of the primary factors influencing runway orientation is wind. FAA criteria for a utility airport specify that a crosswind runway is required if the primary runway is oriented so that the crosswind on it exceeds 12 miles per hour (10.5 knots) more than 5 percent of the time (thus providing less than 95 percent wind coverage). Where a single runway orientation does not provide this usability factor of at least 95 percent, the airport system should include a crosswind runway. For a business jet or transport type runway, the criteria is 15 miles per hour (13 knots).

There is no site-specific FAA approved wind data for Lee Vining Airport. There are strong and variable winds from the south and west due to the mountain flow effects. Only a single runway is practical for meeting demand based on terrain in the vicinity.

Runway/Taxiway Markings

For paved runways, white runway numbers and centerline stripes are recommended. Non-precision and precision runways have additional threshold and edge markings. Yellow taxiway markings along the centerline and a transverse holding line a specified distance from the runway centerline are recommended. The proper distances are found in the Airport Plans chapter and depicted on the Airport Layout Plan.

Taxiways

The addition of taxiways increases the airport operational efficiency and the runway capacity potential. Exit taxiways should be located at frequent intervals along a runway to serve each type of aircraft operating under variable landing conditions. They should provide for a free flow of aircraft to a point where the aircraft is clear of the runway, thereby ensuring continuous flow and maximum capacity. Parallel taxiways are recommended to enhance airport operational flexibility efficiency.

There are no taxiways at the airport except for the single entrance serving threshold 33. Based on the taxiway analysis, the addition of a full-length parallel taxiway and new exit is desirable to enhance safety by promptly clearing traffic off the runway and improving access to the apron.

Visual Aids/Lighting

The following visual aids and lighting are considered to be the minimum necessary at a well-planned, public, general aviation airport:

Basic runway markings
Segmented circle
Lighted wind cone
Rotating beacon
Medium Intensity Runway Lights (MIRL)
Precision Approach Path Indicator System (PAPI)

In addition to the above visual aids and lighting, airports with precision or non-precision approaches and larger aircraft have some of the following:

Runway End Identifier Lights (REIL)
High Intensity Runway Lights (HIRL)
Runway distance marker signs
Approach light systems with sequence flashing lights
Non-precision or precision runway markings

The Lee Vining Airport has radio controlled low intensity direct burial runway edge lighting. Additions for Runway 15-33 include reconstruction and placement in conduit for the runway edge lighting system, runway distance marker signs, PAPI, and REIL. All lighting should be radio controlled by pilots. Additions to the lighting systems will be incorporated in the capital improvement program.

Terminal Area

Terminal area requirements include airplane parking and tiedown aprons, buildings and hangars, roads and auto parking. The Facility Requirements table at the end of this chapter presents the summary of necessary facilities.

Airplane Parking and Tiedown Aprons

The currently available apron tiedown positions are adequate to meet demand through the forecast period. The apron area configuration provides good parking and spacing for aircraft.

The facility requirements for airplane parking and tiedown aprons were determined by relating existing and planned apron tiedown positions with projected demand by aircraft type. The Facilities Requirements Summary table identifies the demand for aircraft parking by type.

Future based aircraft tiedown space requirements reflect the assumption of hangar demand and the ability to satisfy hangar demands. If adequate hangar facilities are not available, the requirements for based tiedown positions will increase.

Buildings and Hangars

The number of hangars depends upon local demand and climate. Presently, there are three hangar spaces available at the airport. The severe weather requires a hangar for each based aircraft. Hangar demand is estimated at 4 in 2010. Old existing private hangars will need to be removed for new hangar development.

Airport buildings should be constructed to fulfill specific needs. In the event an airport business chooses to locate at Lee Vining, the building should provide space for repair and maintenance, air charter, shops, sales and administrative buildings accommodating the public including pilots, passengers, and visitors. It is desirable to have a fixed base operator aircraft maintenance hangar, since there are currently no hangars on the airport suitable for an aircraft maintenance operation. The building could be multifunction to meet additional county needs.

Roads and Auto Parking

Access to the airport is important to provide a safe method of travel within the airport clear of aircraft activity. The two-lane gravel road has sufficient capacity to accommodate airport generated vehicular traffic demands but an asphalt surface is needed.

There is no designated auto parking area at the airport. Users park adjacent to the hangars and apron. As part of terminal building development, designated parking should be provided. Based on the forecasts, auto parking for the year 2020 is estimated to be 3 spaces (see Table 12).

Support Facilities

Support facilities for the airport include communications, fuel storage and distribution, electric power, water supplies, wastewater disposal, and storm water collection and disposal. Availability of these facilities is essential to the operation of the airport. Fueling facilities, telephone, water supply and sewage disposal are needed at the airport to meet future needs.

Land Area Requirements

The initial step in any airport development is the determination of sufficient land to ensure that (1) the airport can accommodate the long-term air traffic requirements, and (2) the land area contains airport operational areas under appropriate control to ensure compatibility of land use around the airport. The amount of land needed can vary considerably in size depending on landing area (e.g., length, number, and layout of runways and taxiways), approach areas (e.g., runway protection zones), and building area (e.g., T-hangars, aircraft tiedowns, buildings, auto parking). Specific land area requirements are subject to siting and layout and, therefore, are discussed in Chapter Five, Airport Plans.

Table 12
Facility Requirements Summary
Lee Vining Airport

	2000	2005	2010	2015	2020
Demand					
Based Aircraft	1	3	4	4	4
Aircraft Operations	2,000	2,000	2,667	2,667	2,667
Airfield Facilities					
Runways - Number	1	1	1	1	1
Longest Length (Feet)	4,095	5,760	5,760	5,760	5,760
Width (Feet)	60	60	60	60	60
Strength (Pounds - Single)	8,000	12,500	12,500	12,500	12,500
Terminal Facilities					
Airport Business Tenants	0	0	0	0	0
Acres	0.0	0.0	0.0	0.0	0.0
Auto Parking - Spaces	1	2	3	3	3
Acres	0.1	0.0	0.0	0.0	0.0
Hangars - Spaces	1	3	4	4	4
Acres	0.1	0.3	0.4	0.4	0.4
Open Tiedown Spaces					
Based	0	0	0	0	0
Transient	3	4	5	6	7
Open Tiedown Acres					
Based	0.0	0.0	0.0	0.0	0.0
Transient	0.3	0.4	0.6	0.7	0.8
Total Terminal Area Acres	0.5	0.7	1.0	1.1	1.2
Access					
Access Road Lanes	2	2	2	2	2
Daily Vehicle Trips	5	15	20	20	20
Peak Hour Trips	1	2	2	2	2

NOTE: Acreage requirements will vary depending on specific layout and geometrics.

Source: Wadell Engineering Corporation

The foregoing comments about facilities required during the planning period are directly input to the Airport Plans chapter and are used in developing physical layouts. Once the layouts are prepared, quantities and cost estimates for development are determined and presented in Chapter Six, Implementation Plans.

5. AIRPORT PLANS

The Airport Plans represent the end-result of considering alternative configurations of facilities, the location and alignment of hangars, the aircraft parking aprons, and the construction of the runway and taxiway system. Incorporated in the Airport Plans are the recommended development items for the three major airport components: the airfield, the airport terminal area, and the access and parking system. Chapter 6, Implementation Plans, discusses the stage development program for these airport improvements, as well as their cost and the economic/financial impacts of undertaking their development.

The specific objectives of the Airport Plans are to provide:

- A safe airfield system with adequate runway length, strength, and clearances for small aircraft use.
- Terminal facilities for general aviation aircraft, pilots, and passengers with adequate and convenient aircraft basing area, buildings, auto parking, and access.
- A flexible development plan with space and use relationships that will enhance service and provide user and community benefits.
- An economical plan that will provide suitable facilities and generate revenues necessary for proper operation, management and development of the airport.

Airport Layout Plan

The Airport Layout Plan (located in Appendix B) depicts the airfield system and terminal area. It includes the runway, taxiways, lighting, on-airport navaids, and the runway protection zones. The existing runway is 4,095 feet long by 50 feet wide. The runway is not adequate in length or width for the limited current and future use.

Runway 15-33 can be extended to the northwest yet the terrain limits the practical length to 4,940 feet, less than the standard 5,760 feet. However, standard 240-foot paved overruns are possible.

A new 25 foot wide parallel taxiway will serve Runway 15-33. The runway to taxiway distance will be 150 feet. Since the airport serves small aircraft and is not heavily used, this separation will be adequate. A new exit taxiway should be constructed to allow aircraft to exit the runway before reaching the ends. The parallel taxiway connects with the apron in two places to provide easy access.

Usually holding aprons are constructed at both ends of the runway to provide an area clear of taxiway traffic for aircraft to park while the "before-takeoff-check" is performed and IFR departure clearance is obtained. Construction of holding aprons minimizes delays to departing aircraft by providing bypass capability. Yet the relatively low activity level at Lee Vining does not require holding aprons although one is shown for departures on Runway 33.

The airfield lighting at Lee Vining consists of low intensity runway edge lighting, a lighted windcone and airport rotating beacon. The runway edge lighting system was constructed decades ago and is stake mounted with direct burial cable. The lighting system should be replaced in conduit with new fixtures. Improved taxiway exit lighting is needed. New retroreflective taxiway edge markers should be installed on all taxiways.

The plan calls for a new PAPI serving both ends of runway 15-33. Runway end identifier lights should be installed on both ends to enhance pilot recognition of the runway at night or hazy conditions. The addition of distance remaining signs will enhance aircraft operation safety, especially because of the relatively short runway.

Airfield signing needs to be updated. New lighted signs would serve runway 15-33. Taxiways that have edge reflectors instead of lights would be signed with reflective signs since power is not available.

The airport lighting vault is original and needs to be replaced to meet code and provide expanded space for lighting components. A freestanding metal building should be constructed adjacent to the existing structure. This allows for minimal relocation of service and limited downtime during construction.

Table 13 identifies the runway setback requirements for Lee Vining Airport. These requirements have been adjusted to properly accommodate the layout and development of the runway and taxiway system and adjacent aircraft parking and building areas. The criteria identified in Table 13 meet or exceed the FAA standards. Runway setback requirements are indicated on the Airport Layout Plan. For Lee Vining Airport, the runway safety area (RSA) is centered on the runway and has a width of 120 feet. In this area, no object may penetrate the volume of space above this zone except for necessary lighting and frangible-mounted navaids.

The building setback line (BSL) identifies the closest point to the runway that any building may be constructed. The minimum BSL is set back from the apron edge to allow for unconstrained movements and building development areas. Buildings should be restricted from the runway protection zones. In practice, a building's height must be considered before siting its location, and the requirements of Federal Aviation Regulations Part 77 must be satisfied regarding obstructions to navigable airspace. The BSL is designed to not only meet setback requirements, but also prevent buildings or permanent objects from being placed inside the ROFA. Furthermore, the BSL is set back far enough to prevent aircraft operational aprons from being blocked by unintentional placement of structures.

The runway obstacle free area (ROFA) is also shown. The following table summarizes the setback requirements for the runways.

Table 13
Runway Setback Requirements
Lee Vining Airport

	Lateral Distance from Runway CL		
Runway	BSL	RSA	ROFA
15-33	Varies	60'	125'

Source: Wadell Engineering Corporation

Table 14 summarizes detailed FAA criteria and design standards that apply to Lee Vining Airport. The table is based on approach category A design group 1 aircraft with visual approaches to both ends of the runway.

Table 14: Airport Design Criteria
Lee Vining Airport

AIRPORT DESIGN AIRPLANE AND AIRPORT DATA

Aircraft Approach Category	A
Airplane Design Group	I (Small Airplanes Exclusively)
Airplane wingspan	48.99 feet
Primary runway end approach visibility minimums are	visual exclusively
Other runway end approach visibility minimums are	visual exclusively
Airplane undercarriage width (1.15 x main gear track)	16.00 feet

RUNWAY AND TAXIWAY WIDTH AND CLEARANCE STANDARD DIMENSIONS

	Airplane Group /	ARC
Runway centerline to parallel runway centerline simultaneous operations when wake turbulence is not treated as a factor:		
VFR operations with no intervening taxiway	700 feet	
VFR operations with one intervening taxiway	700 feet	
VFR operations with two intervening taxiways	700 feet	
IFR approach and departure with approach to near threshold	2500 feet less	
100 ft for each 500 ft of threshold stagger to a minimum of 1000 feet.		
Runway centerline to parallel runway centerline simultaneous operations when wake turbulence is treated as a factor:		
VFR operations	2500 feet	
IFR departures	2500 feet	
IFR approach and departure with approach to near threshold	2500 feet	
IFR approach and departure with approach to far threshold	2500 feet plus	
100 feet for each 500 feet of threshold stagger.		
IFR approaches	3400 feet	
Runway centerline to parallel taxiway/taxilane centerline	149.5	150 feet
Runway centerline to edge of aircraft parking	125.0	125 feet
Runway width	60 feet	
Runway shoulder width	10 feet	
Runway blast pad width	80 feet	
Runway blast pad length	60 feet	
Runway safety area width	120 feet	
Runway safety area length beyond each runway end or stopway end, whichever is greater	240 feet	
Runway object free area width	250 feet	
Runway object free area length beyond each runway end or stopway end, whichever is greater	240 feet	
Clearway width	500 feet	
Stopway width	60 feet	
Obstacle free zone (OFZ):		
Runway OFZ width	250 feet	
Runway OFZ length beyond each runway end	200 feet	
Inner-approach OFZ width	250 feet	
Inner-approach OFZ length beyond approach light system	200 feet	
Inner-approach OFZ slope from 200 feet beyond threshold	50:1	
Inner-transitional OFZ slope	0:1	

Table 14: Airport Design Criteria (Continued)

Runway protection zone at the primary runway end:	
Width 200 feet from runway end	250 feet
Width 1200 feet from runway end	450 feet
Length	1000 feet
Runway protection zone at other runway end:	
Width 200 feet from runway end	250 feet
Width 1200 feet from runway end	450 feet
Length	1000 feet
Departure runway protection zone:	
Width 200 feet from the far end of TORA	250 feet
Width 1200 feet from the far end of TORA	450 feet
Length	1000 feet
Threshold surface at primary runway end:	
Distance out from threshold to start of surface	0 feet
Width of surface at start of trapezoidal section	250 feet
Width of surface at end of trapezoidal section	700 feet
Length of trapezoidal section	2250 feet
Length of rectangular section	2750 feet
Slope of surface	20:1
Threshold surface at other runway end:	
Distance out from threshold to start of surface	0 feet
Width of surface at start of trapezoidal section	250 feet
Width of surface at end of trapezoidal section	700 feet
Length of trapezoidal section	2250 feet
Length of rectangular section	2750 feet
Slope of surface	20:1

	Airplane Group	ARC
Taxiway centerline to parallel taxiway/taxilane centerline	68.8	69 feet
Taxiway centerline to fixed or movable object	44.3	44.5 feet
Taxilane centerline to parallel taxilane centerline	63.9	64 feet
Taxilane centerline to fixed or movable object	39.4	39.5 feet
Taxiway width	26.0	26 feet
Taxiway shoulder width	10 feet	
Taxiway safety area width	49.0	49 feet
Taxiway object free area width	88.6	89 feet
Taxilane object free area width	78.8	79 feet
Taxiway edge safety margin	5 feet	
Taxiway wingtip clearance	19.8	20 feet
Taxilane wingtip clearance	14.9	15 feet

Based on FAA AC 150/5300-13, Airport Design.

Source: Wadell Engineering Corporation

The Airport Layout Plan shows the future fencing program necessary for proper operation of the airport. The purpose of a properly prepared fencing program is to minimize hazards to pedestrians and ground vehicles by separating them from aircraft as a safety measure. Furthermore, fencing allows for better definition of airport property and areas under lease to airport tenants. The fencing as shown generally reflects perimeter fencing of the airport property, but also identifies fencing necessary in the terminal areas to separate aeronautical from ground base activities. In addition, fencing should be provided to keep out non-airport activities unless a suitable lease agreement and ingress/egress permit is established.

Approach and Runway Protection Zone Plan

An Approach and Runway Protection Zone Plan, presented in the Appendix, was prepared for Lee Vining Airport. This provides plan view information for the runway approach areas.

A key function of this drawing is (1) to provide a basis for height zoning in the airport environs, and (2) to identify obstructions in the vicinity of the airport, which may have an impact on the use of the runways and adjacent airspace. The drawing was prepared using criteria contained in Federal Aviation Regulations, Part 77, "Objects Affecting Navigable Airspace."

At Lee Vining, the FAR Part 77 dimensional standards applied for runway 15-33 are those relating to "visual" runways. The plan shows imaginary primary, approach, transitional, horizontal, and conical surfaces. The primary surface surrounds the runway and extends 200 feet beyond the thresholds. The width of the primary surface is 250 feet. The elevation of the primary surface is the same as the runway centerline.

The approach surfaces rise from the ends of the primary surfaces. The slope of the surface is 20:1 with a length of 5,000 feet. The approach surface flares from an inner width equal to the primary surface to an outer width equal to 1,250 feet.

The transitional surfaces are sloped at 7:1 from the primary surface and approach surfaces until intersecting the horizontal surface. The horizontal surface is 150 feet above the airport elevation and extends 5,000 feet from the primary surface of runway 15-33. At the limit of the horizontal surface, a conical surface of 20:1 slope and a 4,000-foot width completes the required protection surfaces for this airport.

The Approach and Runway Protection Zone Plan in the Appendix indicates that the terrain west of the airport penetrates the conical and portions of the horizontal surface. It is appropriate that the aircraft traffic pattern is east of the runway.

6. IMPLEMENTATION PLANS

The Implementation Plans chapter contains information concerning the capital improvement program, the financial program, and the implementation schedule. The Implementation Plans are prepared based upon (1) the facilities required to accommodate forecast demand, and (2) the development of those facilities as discussed in Chapter 5, Airport Plans.

Capital Improvement Program

The Capital Improvement Program is comprised of (1) stages of development, and (2) cost estimates of improvements proposed in this Master Plan study. The development program is presented in three stages so that all projects can be undertaken when demand justifies development. The cost estimates are prepared in current dollars, and are to be used for planning purposes only.

Stage Development

The objectives of the first stage of development, 0-5 years, are (1) preparation of an environmental assessment under NEPA and CEQA, (2) expanded land lease for property additions, (3) perimeter fencing and card access control gate, (4) AVGAS fuel farm (5) replacement, widening and extension of the runway with parallel taxiway and lighting systems, (6) apron expansion, (7) hangars with taxiways, and (8) automatic weather observation system.

The Capital Improvement Program Cost Summary Table shows that the most significant expenditures during the 20-year capital improvement program occur in Stage I. These expenditures are needed for the replacement of the runway, taxiway and apron pavement and lighting systems to meet FAA standards.

The second stage of development, 6-10 years, includes development of a large county owned aircraft maintenance hangar and terminal facilities.

The third stage of development, 11-20 years, primarily concerns pavement seal coating and marking.

Cost Estimates

The following Capital Improvement Program Cost Summary, Table 15, indicates the costs for each stage of development for the airport. Table 16 identifies projects within each time frame. Order of magnitude costs are indicated for planning purposes only. The project costs are separated as to FAA & State share versus local share. The FAA and State portion is based on 94.5 percent funding. Items presently not eligible for FAA funds include revenue producing auto parking, hangar and FBO buildings, fueling systems, and utilities serving ineligible facilities.

Table 15
Capital Improvement Program Cost Summary
Lee Vining Airport
(In 2001 $)

Stage I (2000-2005)	$3,473,000
Stage II (2006-2010)	$1,000,000
Stage III (2011-2020)	$ 120,000
Total	$4,593,000
FAA/State Funds	$3,253,635
Local Funds	$1,339,365
Total	$4,593,000

Source: Wadell Engineering Corporation

Table 16
Capital Improvement Program Cost Estimates
Lee Vining Airport Development
(In 2001 $)

YEAR	STAGE/PROJECT DESCRIPTION	TOTAL COSTS	FAA & STATE FUNDS	LOCAL FUNDS
	STAGE 1			
2002	Environmental Assessment & Project Application	$ 80,000	$ 75,600	$ 4,400
2002	Access Road Modifications	$ 65,000	$ 61,425	$ 3,575
2002	Card Access Control Gate	$ 15,000	$ 14,175	$ 825
2002	Automatic Weather Observation System (AWOS) With Telephone	$ 100,000	$ 94,500	$ 5,500
2002	AVGAS Selfserve Fuel Farm (12,000 gallon)	$ 60,000	$ -	$ 60,000
2002	Perimeter Fencing with Signs	$ 66,000	$ 62,370	$ 3,630
2003	Runway Extensions (60'x845') With Grading and Marking	$ 1,100,000	$ 1,039,500	$ 60,500
2003	Paved Overruns (60'x340') With Grading and Marking	$ 70,000	$ 66,150	$ 3,850
2003	Runway 13/33 - Overlay 50' and Widen 10' With Shoulders and Marking	$ 635,000	$ 600,075	$ 34,925
2004	Medium Intensity Runway Lights	$ 135,000	$ 127,575	$ 7,425
2004	Lighted Runway Distance Remaining Signs	$ 15,000	$ 14,175	$ 825
2004	Lighted Airport Signs	$ 13,000	$ 12,285	$ 715
2004	Runway End Identifier Lights (REIL) - Runway 15/33	$ 20,000	$ 18,900	$ 1,100
2004	Precision Approach Path Indicators (PAPI) - Runway 15/33	$ 65,000	$ 61,425	$ 3,575
2004	Airport Rotating Beacon	$ 20,000	$ 18,900	$ 1,100
2004	Segmented Circle and Lighted Wind Cone	$ 18,000	$ 17,010	$ 990
2004	Lighted Supplemental Wind Cones (2)	$ 8,000	$ 7,560	$ 440
2004	Apron Security Lighting (3)	$ 15,000	$ 14,175	$ 825
2004	Airport Lighting Vault	$ 45,000	$ 42,525	$ 2,475
2005	Parallel Taxiway, Exit "B" and R/W 32 Hold Apron With Grading, Drainage and Markin	$ 580,000	$ 548,100	$ 31,900
2005	Parallel Taxiway Reflectors	$ 18,000	$ 17,010	$ 990
2005	Apron (150'x400') With Grading and Marking	$ 195,000	$ 184,275	$ 10,725
2005	Hangar Taxiway (25'x265') with Site Grading	$ 45,000	$ 42,525	$ 2,475
2005	Unit Hangars (4)	$ 90,000	$ -	$ 90,000
	TOTAL STAGE 1	$ 3,473,000	$ 3,140,235	$ 332,765
	STAGE 2			
2006	County Terminal and Fixed Base Operator Hangar	$ 1,000,000	$ -	$ 1,000,000
	TOTAL STAGE 2	$ 1,000,000	$ -	$ 1,000,000
	STAGE 3			
2018	Seal & Mark All Pavements	$ 120,000	$ 113,400	$ 6,600
	TOTAL STAGE 3	$ 120,000	$ 113,400	$ 6,600
	GRAND TOTALS	$ 4,593,000	$ 3,253,635	$ 1,339,365

NOTE: ASSUMES 90% FAA COMBINED WITH 4.5% STATE GRANTS.

Source: Wadell Engineering Corporation

Financial Program

A sound financial program is instrumental to the successful development of the airport. Proper planning, design, and feasibility studies are efforts spent in vain unless an adequate financing program can be developed to accomplish the improvements indicated. The goals of airport financial planning are to (1) achieve a sound economic operation, (2) provide an adequate level of public facilities, and (3) avoid taxpayer burdens by developing a reasonable financial return from the airport facility. The desirability of future airport development depends on the ability of an airport to achieve a self-supporting status and, within a reasonable time, to cover local development costs. Estimated revenues must be sufficient to help offset annual cost of capital investment and operations.

While the primary responsibility for financing proposed facility development rests with the sponsor, there are many ways that airport development funds can be supplemented. Money for capital improvements may come from a number of sources and may be used singly or in combination to accomplish airport development. Sources available during recent years for financing airport facilities include the FAA's Airport Improvement Program (AIP), the State of California, private donations, leasebacks, direct revenue loans, certificates of participation, and revenue and general obligation bonds. Also, capital improvements can be financed from general funds that are provided by annual operating and tax revenues. The more likely sources of funds are described below.

<u>Federal Aviation Administration</u> funds for airport development are derived from user taxes and are available for land acquisition, construction, alteration, fire fighting, and rescue vehicles and facilities, as well as for establishing and improving air navigation facilities. Both publicly-owned and privately owned public use airports are eligible for such aid provided the proposed project is included in the National Plan of Integrated Airport Systems (NPIAS). The airport is in the NPIAS. Presently, the Federal share of these projects in California is 90 percent of eligible costs.

<u>California State Aeronautics Program</u> funds for airport development are comprised of 90% pure state grants and also 5% grants for matching the FAA grants. The capital projects list presented above assumed that FAA would fund 90% and the state fund 5% of the FAA amount which results in the local share being 5.5% of eligible projects. In addition, each year the state gives a $10,000 annual grant to eligible public airports for operations and maintenance. For revenue producing projects such as hangar and fuel farm development the state has a low interest loan program with interest rates in the 5% range.

<u>Certificate of Participation</u> (COP) is a long-term financing technique using either a lease purchase or installment sale arrangement. While usually used for long-term financing of major facilities such as city or county administration, public safety, courthouse, jail, and parking garage buildings, it has also been used to finance equipment over a 3 to 10 year period. The parties of the transaction include (1) the lessee, which is the public body; (2) the lessor, which can be a non-profit or private leasing corporation or a public agency; (3) the trustee, who holds the security for the payments of the lease; (4) the paying agent (who may be the same as the trustee), who disburses the lease payments to (5) the investors, who purchase the COPs. The funds to meet the lease payments are raised on an annual appropriation basis and non-appropriation may mean the return of the asset financed or action at law or in equity. As further security for the lease payments, insurance or a third-party guarantee may be used or project revenues may be used to make lease payments if the facility is revenue producing.

Municipal Lease Purchase Financing (tax-exempt leasing) is an alternative method for financing public use and acquisition of equipment or facilities otherwise too expensive to be included in annual budgets. Leasing permits political subdivisions to enter into installment sale or lease purchase contracts with principal and tax-free interest increments payable over time. Tax-exempt lease contracts have two requirements: (1) the governmental body must pay the purchase price plus interest over a period of years, and (2) it must have the right to purchase the property for a nominal price at the end of the contract term. The funds to pay the contract installments can come from any source available to the public body. The appropriation is put in the annual budget. Should the appropriation not take place, the balance due on the contract is accelerated and the investor either receives back the asset for which the funds were spent or otherwise seeks relief.

Financing airport improvements directly from the airport enterprise fund is the most economical method of all, since there are no interest payments. Airport improvements financed by this approach could place constraints on money available from the airport fund to meet normal operating and other expenses.

For Mono County funding from the FAA and State combined with revenues from the airport fund is the most cost effective and practical method of airport development. State loans are the best sources of funding for airport hangars and fueling facilities with repayment from the airport fund.

Cash Flow Analysis

Pricing of airport services and facilities is a sensitive issue and subject to controversy. Each party may have a different perspective and motivation. While a public entity may seek a yearly return equal to yearly expenditures, private business may seek to maximize profits, and some airport users feel that a facility supported by public funds should be willing to charge less and even sometimes operate at a deficit. Local governments have to cover costs, or must accept a deficit with the view that other community revenues are increased adequately to warrant a deficit.

Many airports seek to attain a high degree of self-sufficiency and have rates and charges commensurate with the operating costs and capital improvement expenses. At other airports, local conditions and circumstances preclude charging full actual costs and a public entity may choose to absorb some of the financial burden and not pass it on to the user.

The preceding section on financing considerations indicates some of the mechanisms typically used for financing the local share for airport projects. An early determination should be made as to the most desirable and feasible approach to initiate implementation. The only long-term satisfactory way to resolve concerns regarding financing is through a strong statement of airport financial policy and aggressive implementation of that policy. For this reason, it is essential that a financial policy and program be established and monitored regularly. It should be recognized that the fees and charges levied would be less than possible with private facilities because public agencies can receive Federal funding for facility development.

The estimated Lee Vining Airport Financial Analysis, presented on the Cash Flow Analysis Table 17, is a key element of this study. Through this analysis, the capital improvement program and the projection of annual operating income and expenses are brought together to establish an estimate of the future financial condition over the twenty-year planning period for the airport.

Table 17
Cash Flow Analysis
Lee Vining Airport
(In 000's of 2001 $)

YEAR		2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
INCOME																					
Based Aircraft Tiedowns		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Transient Aircraft Tiedowns		0.0	0.2	0.2	0.2	0.2	0.9	0.9	0.9	1.0	1.0	1.0	1.0	1.1	1.1	1.1	1.2	1.2	1.2	1.3	1.3
Hangars - Land Lease		0.0	1.8	1.8	1.8	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hangars - New		0.0	0.0	0.0	0.0	0.0	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2
Large Maintenance Hangar		0.0	0.0	0.0	0.0	0.0	90.0	90.0	90.0	90.0	90.0	90.0	90.0	90.0	90.0	90.0	90.0	90.0	90.0	90.0	90.0
Fuel Net Revenue		0.0	0.0	1.0	1.0	1.1	5.0	5.2	5.3	5.5	5.6	5.9	6.0	6.1	6.3	6.5	6.7	6.9	7.1	7.3	7.6
	Total	0.0	2.0	3.0	3.0	3.1	109.1	109.3	109.4	109.6	109.8	110.0	110.2	110.4	110.6	110.9	111.1	111.3	111.6	111.8	112.1
EXPENSE																					
Salaries		0.2	0.2	0.2	0.2	0.2	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Airport Maintenance		4.5	4.5	4.5	4.5	4.5	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
Supplies		0.5	0.5	0.5	0.5	0.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Insurance		1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Utilities		0.5	0.5	0.5	0.5	0.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Airport Land Lease		1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
Miscellaneous Expenses		0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
	Total	9.0	9.0	9.0	9.0	9.0	22.6	22.6	22.6	22.6	22.6	22.6	22.6	22.6	22.6	22.6	22.6	22.6	22.6	22.6	22.6
ANNUAL STATE ALLOCATION		10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
OPERATING PROFIT (LOSS)		1.1	3.1	4.1	4.1	4.1	96.5	96.7	96.8	97.0	97.2	97.4	97.6	97.8	98.0	98.3	98.5	98.7	99.0	99.2	99.5
CAPITAL IMPROVEMENT PROGRAM																					
Total Project Cost		0.0	386.0	1805.0	354.0	928.0	1000.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	120.0	0.0	0.0
FAA / State Share		0.0	308.1	1705.7	334.5	791.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	113.4	0.0	0.0
Local Share		0.0	77.9	99.3	19.5	136.1	1000.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.6	0.0	0.0
ANNUAL CASHFLOW		1.1	-74.8	-95.2	-15.4	-132.0	-903.5	96.7	96.8	97.0	97.2	97.4	97.6	97.8	98.0	98.3	98.5	98.7	92.4	99.2	99.5
ACCUMULATIVE CASHFLOW		1.1	-73.8	-169.0	-184.4	-316.4	-1219.9	-1123.2	-1026.4	-929.4	-832.2	-734.8	-637.1	-539.3	-441.3	-343.0	-244.5	-145.8	-53.4	45.8	145.3

Source: Wadell Engineering Corporation

The Cash Flow Analysis is stated in terms of constant 2001 dollars and is based on several components:

- Operating income
- Operating expense
- Operating profit/loss
- Capital requirements
- Annual cash flow
- Accumulative cash flow

A philosophy and fee schedule must be established in order to assure that adequate operating income is collected. It is necessary to generate significant revenue at the airports to provide for matching of FAA and state grants in order to implement the capital improvement program. The underlying assumption for the income schedule is that the local pilots and other users sincerely desire development of new airfield and terminal facilities, and are willing to pay appropriate fees.

Lee Vining Airport competes with other airports in the region for receiving Federal and State aid. Only airports with available grant matching funds can receive grants. Revenue must be generated on the airport with the intent that it will be returned to users in the form of grants for airport improvements.

The Lee Vining Airport is an important asset to the County. In order to achieve full potential, the airport needs to generate some revenues. Sound lease policies and rate structures must be established with the goal of providing sufficient revenues so that the airport can meet its housekeeping responsibilities and develop a reserve for future expansion.

Table 18
Major Revenue Assumptions
Lee Vining Airport

Tiedowns: Based $35/month
Tiedowns: Transient $5/night
Hangars:
  New $275/month
  Large Maintenance Hangar $90,000/year
Hangar Land Lease (Old): $50/month

Source: Wadell Engineering Corporation

The operating income is comprised mostly of based aircraft tiedowns, transient aircraft parking fees, new hangars, hangar land leases, and fuel flowage fees. New prevailing rates and charges were assumed to be established based on adjustments to lease rates currently in effect.

There are three hangar land leases and none pay rent. It is assumed all three will pay the new rates in 2002. Leases will not be renewed when the new hangars open in 2006.

New hangar construction is planned for the airport during the planning period. New hangar revenue will be a good source of income for the County. Lease rates on these hangars should be set so that the revenue produced will offset the cost of construction and provide a capital recovery

fund. A large terminal / FBO hangar is planned for the second stage. Annual revenue is assumed to be 9% of the capital cost.
The operating expenses for the airport are comprised primarily of salaries, maintenance labor and supplies, insurance, utilities, and miscellaneous. It is assumed that there will be minor salary charges to the airport by county staff. Any larger salary expenditures would be related to project grants.

Airport maintenance related labor is expended as necessary. It is assumed that there would be increases in both maintenance labor and materials because the expanded airport will have more lighting to maintain and snow and weed removal will take place throughout the year. The capital improvement program provides for reconstruction of eligible airport paving and lighting systems thereby precluding the expense of major maintenance programs.

Utilities will increase primarily for electricity related to additional lighting at the airport when the runway and taxiway system is expanded. Miscellaneous costs include attendance by airport staff at state and FAA meetings and special community related activities. The major expense assumptions and their increases are listed in the following table.

Table 19
Major Expense Assumptions
Lee Vining Airport

Salaries	$200/year, increasing to $800 in 2006.
Airport Maintenance	$4,500/year, increasing to $12,000 in 2006.
Supplies	$500/year, increasing to $3,500 in 2006.
Insurance	$1,500/year, no increase.
Utilities	$450/year, increasing to $3,000/year in 2006.
Airport Land Lease	$1,300 per year.
Miscellaneous Expenses	$500/year, no increase.

Source: Wadell Engineering Corporation

Based on the revenue and expense assumptions, the annual income and expenses were combined to determine the operating profit (loss). When the operating profit (loss) is coupled with the local share of new capital requirements, the cash flow results. Due to the state's annual $10,000 allocation, the airport generates positive results each year through the year 2020.

When combined with the County share of new capital to match grants for capital improvements, there is a negative annual cashflow for five of the years and a negative accumulative cashflow until the end of the planning period to repay capital expenditures. The cash flow analysis utilizes current dollars and airport operations on a "cash basis."

Sources of financing have not been applied, such as loans for hangar development; therefore negative numbers result until capital expenditures are repaid. Yet during the 20 year planning period the airport will have been reconstructed, expanded, and new revenue-producing County hangars developed. After the planning period, there would not be any significant FAA/State and local capital requirements other than maintenance and repair of facilities as they age.

Two vital assumptions used in the Cash Flow Analysis tables are (1) the willingness and cooperation of the based aircraft owners and visitors to pay new fees to the airport fund and (2) the FAA and state funding will occur and will be 94.5 percent of all eligible items.

Implementation Schedule

The efforts in the planning process are brought to fruition through acceptance of the Master Plan, followed by implementation steps that include incorporation into the general plan, updating of zoning, and seeking grant funds. The Airport Layout Plan approval occurs after completion of the FAA review and coordination among the divisions of the FAA.

Full approval of the ALP cannot occur until there is an environmental clearance, since the runway extension requires environmental review. The first step is the preparation of an environmental assessment under NEPA to allow for FAA to make their determination. Unrelated projects may move forward, yet the major work can not be programmed or funded until there is an environmental clearance. A combined document should be prepared to obtain both a federal and state action.

The implementation schedule for the Stage I capital improvements is shown in the following table. The Stage I capital improvements recommended in the Stage Development Program are to be implemented (1) as requirements for facilities arise, and (2) in a manner consistent with the financial capabilities of the County.

Table 20
Implementation Schedule
Lee Vining Airport

STAGE I ACTIVITIES	INITIATION DATE
FAA Grant Applications	Spring 2002
Environmental Assessment	Summer 2002
FAA Stage 1 Funding	Fall 2003
Surveying, Design and Bidding	Winter to Spring 2004
Construction	Summer 2004

Source: Wadell Engineering Corporation

APPENDICES

APPENDIX A
GLOSSARY
LEE VINING AIRPORT

Aircraft Approach Category. A grouping of aircraft based on 1.3 times stall speed in a landing configuration at maximum certificated landing weight. The categories are A, B, C, D, and E.

Airplane Design Group (ADG). A grouping of airplanes based on wingspan. The groups are I, II, III, IV, V, and VI.

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

Airport Layout Plan (ALP). The plan of an airport showing the layout of existing and proposed airport facilities. All development must be in accordance with the FAA approved ALP.

Airport Reference Code (ARC). A coding system used to relate airport design criteria to the operational and physical characteristics of the airplanes intended to operate at the airport. The code has two components relating to the airport design aircraft. The first component, depicted by a letter, is the aircraft approach category and relates to aircraft approach speed. The second component, depicted by a Roman numeral, is the airplane design group and relates to airplane wingspan.

Airport Reference Point (ARP). The latitude and longitude of the approximate center of the - airport.

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 - airports.

Clearway (CWY). A defined rectangular area beyond the end of a runway cleared or suitable for use in lieu of runway to satisfy takeoff distance requirements.

Compass Calibration Pad. An airport facility used for calibrating an aircraft compass.

Declared Distances. The distances are:

> **Takeoff run available (TORA) -** the runway length available for takeoff.
>
> **Takeoff distance available (TODA) -** the runway length available for takeoff plus the length of available clearway (CWY).
>
> **Accelerate-stop distance available (ASDA) -** the runway length available for takeoff plus the length of available stopway (SWY).
>
> **Landing distance available (LDA) -** the runway length available for landing.

Hazard to Air Navigation. An object that the FAA determines will have a substantial adverse effect upon the safe and efficient use of navigable airspace by aircraft, operation of air navigation facilities, or existing or potential airport capacity.

Large Airplane. An airplane weighing more than 12,500 pounds (5,700 kg) maximum certificated takeoff weight.

Master Plan. An airport planning study to identify existing facilities, to determine facilities required to meet future needs and to prepare graphics and a capital improvement program depicting future facilities and development. The Airport Layout Plan is the primary document that results from the master plan.

Object. Includes, but is not limited to above ground structures, NAVAIDs, people, equipment, vehicles, natural growth, terrain, and parked aircraft.

Object Free Area (OFA). A two-dimensional ground area surrounding runways, taxiways, and taxilanes which is clear of objects except for objects whose location is fixed by function.

Obstacle Free Zone (OFZ). The airspace defined by the runway OFZ and, as appropriate, the inner-approach OFZ and the inner-transitional OFZ, which is clear of object penetrations other than frangible NAVAIDs.

Runway OFZ - The airspace above a surface centered on the runway centerline.

Inner-approach OFZ - The airspace above a surface centered on the extended runway centerline. It applies to runways with an approach lighting system.

Inner-transitional OFZ - The airspace above the surfaces located on the outer edges of the runway OFZ and the inner-approach OFZ. It applies to precision instrument runways.

Obstruction to Air Navigation. An object of greater height than any of the heights or surfaces presented in Subpart C of FAR Part 77. Obstructions to air navigation are presumed to be hazards to air navigation until an FAA study has determined otherwise.

Runway (RW). A defined rectangular surface on an airport prepared or suitable for the landing or takeoff of airplanes.

Runway Blast Pad. A surface adjacent to the ends of runways provided to reduce the erosive effect of jet blast and propeller wash.

Runway Protection Zone (RPZ). An area, formerly the clear zone, used to enhance the safety of aircraft operations. It is at ground level beyond the runway end.

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 Type. A runway use classification related to its associated aircraft approach procedure. The runway types are:

> **Visual runway** - A runway without an existing or planned straight-in instrument approach procedure.

Nonprecision instrument runway - A runway with an approved or planned straight-in instrument approach procedure which has no existing or planned precision instrument approach procedure.

Precision instrument runway - A runway with an existing or planned precision instrument approach procedure.

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.

Small Airplane. An airplane weighing 12,500 pounds (5,700 kg) or less maximum certificated takeoff weight.

Stopway (SWY). A defined rectangular surface beyond the end of a runway prepared or suitable for use in lieu of runway to support an airplane, without causing structural damage to the airplane, during an aborted takeoff.

Taxilane (TL). The portion of the aircraft parking area used to access taxiways and aircraft parking positions.

Taxiway (TW). 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.

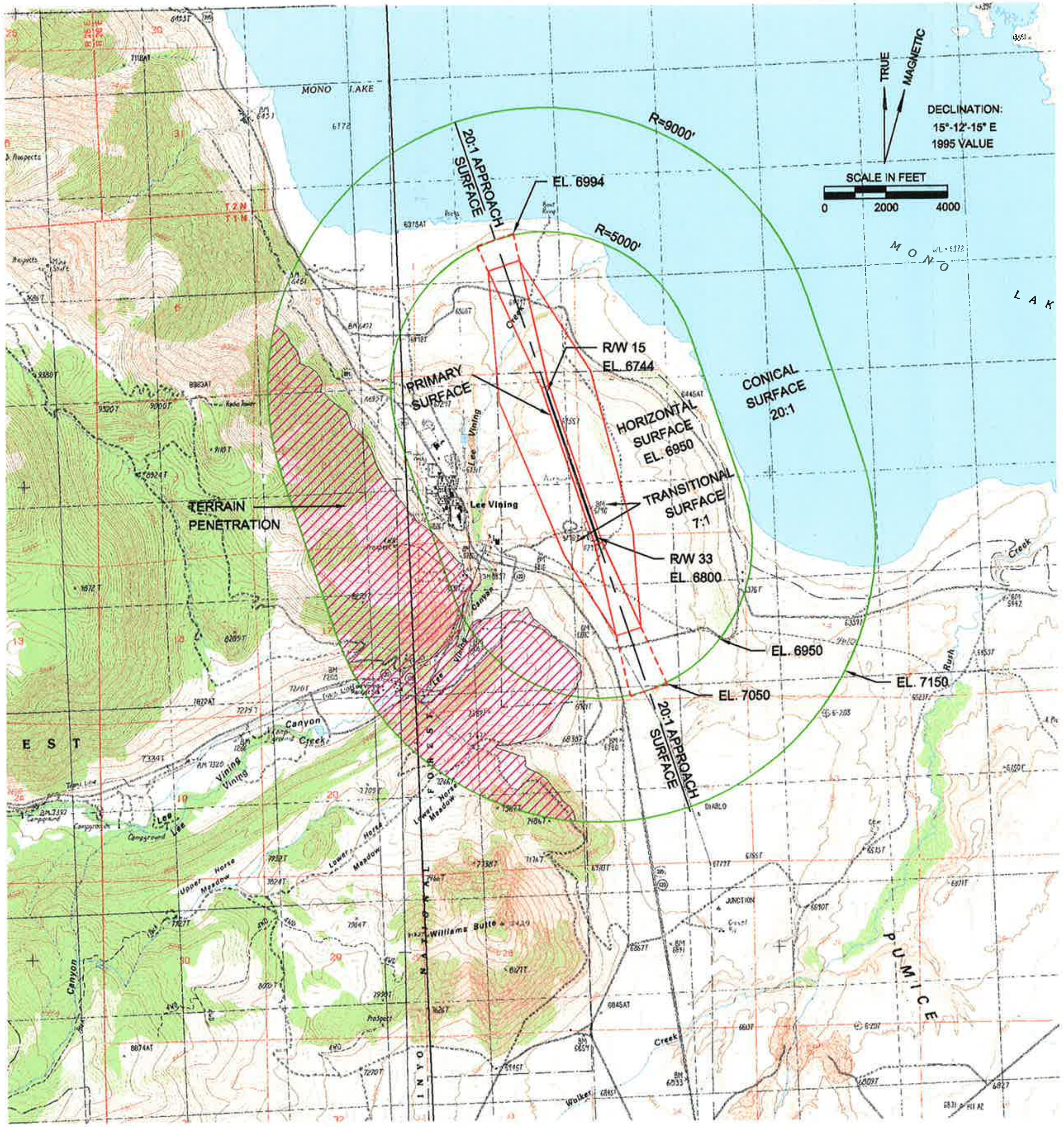
Threshold (TH). The beginning of that portion of the runway available for landing. When the threshold is located at a point other than at the beginning of the pavement, it is referred to as either a displaced or a relocated threshold depending on how the pavement behind the threshold is used.

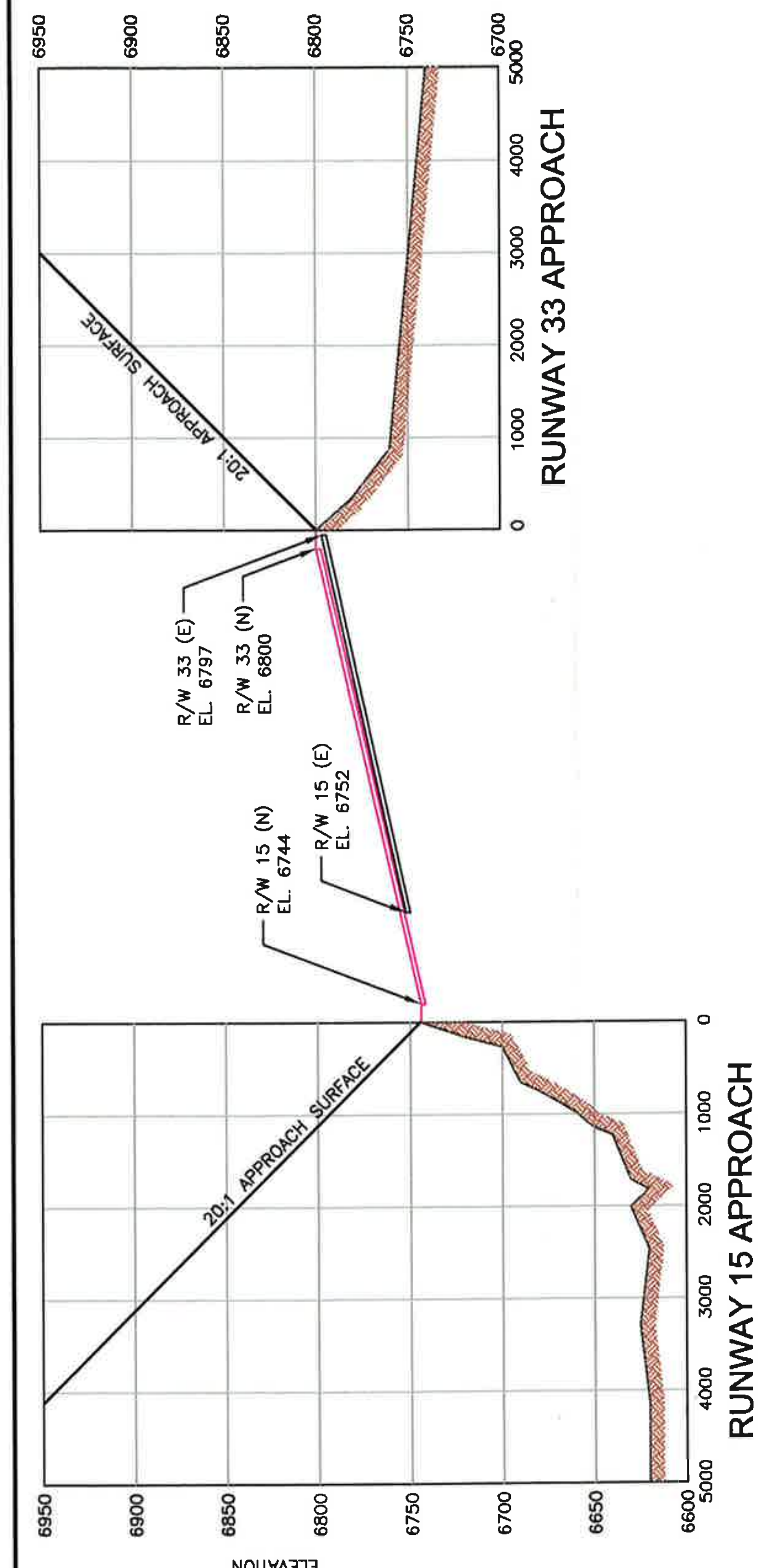
Displaced threshold - the portion of pavement behind a displaced threshold is available for takeoffs in either direction and landings from the opposite direction.

Relocated threshold - the portion of pavement behind a relocated threshold is not available for takeoff or landing. It may be available for taxiing of aircraft.

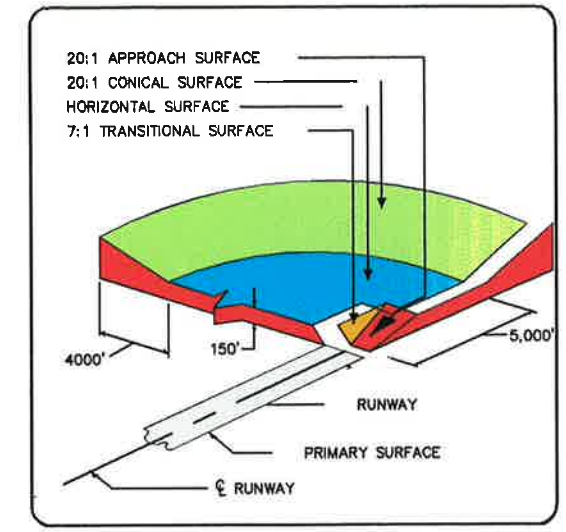
Transport Airport. An airport designed, constructed, and maintained to serve airplanes in Aircraft Approach Category C and D.

Utility Airport. An airport designed, constructed, and maintained to serve airplanes in Aircraft - Approach Category A and B.





ISOMETRIC VIEW



NOTES:

1. HEIGHT RESTRICTION ZONING IS PRESENTLY IN EFFECT.
2. THIS PLAN IS INTENDED TO PRESERVE AND PROTECT FOR A 4940' BASIC UTILITY RUNWAY WITH VISUAL APPROACHES.
3. PENETRATIONS OF THE APPROACH, TRANSITIONAL, AND CONICAL SURFACES ARE AS PRESENTED AND TABULATED.
4. PROFILES REPRESENT A COMPOSITE OF THE HIGHEST TERRAIN IN THE APPROACH SURFACES.
5. INFORMATION SOURCE: CURRENT U.S.G.S. BASE MAPS, TOPOGRAPHIC SURVEY OF MAY 2000.
6. AIRPORT ELEVATION IS 6800' MSL. AIRPORT REFERENCE POINT COORDINATES ARE AS FOLLOWS:

	EXISTING	FUTURE
7. LATITUDE	37°57'28.05"	37°57'33.40"
LONGITUDE	119°06'21.00"	119°06'23.13"

SUMMARY OF APPROACH CRITERIA

RUNWAY 15-33	EXISTING	FUTURE
NAVAIDS	NONE	NONE
TYPE	VISUAL	VISUAL
APPROACH SURFACE		
LENGTH	5000'	5000'
SLOPE	20:1	20:1
CLEAR ZONE		
INNER WIDTH	250'	250'
OUTER WIDTH	1250'	1250'
LENGTH	5000'	5000'

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LEE VINING AIRPORT
A COUNTY OF MONO AVIATION FACILITY
LEE VINING CALIFORNIA

APPROACH AND RUNWAY PROTECTION ZONE PLAN

NO.	DATE	BY	REVISIONS
DRAWN DLH	CHECKED RPW	DESIGNED REV	

JOB NUMBER 1302 · DRAWING NUMBER 1302-LVRPZ

DRAWING 1 OF 1 · SCALE AS SHOWN · DATE OCT 2002

1302-LVRPZ 09-30-02 (1=1) XREF: X-BRDR, USGS-H18H2 REF: H137119, H237119

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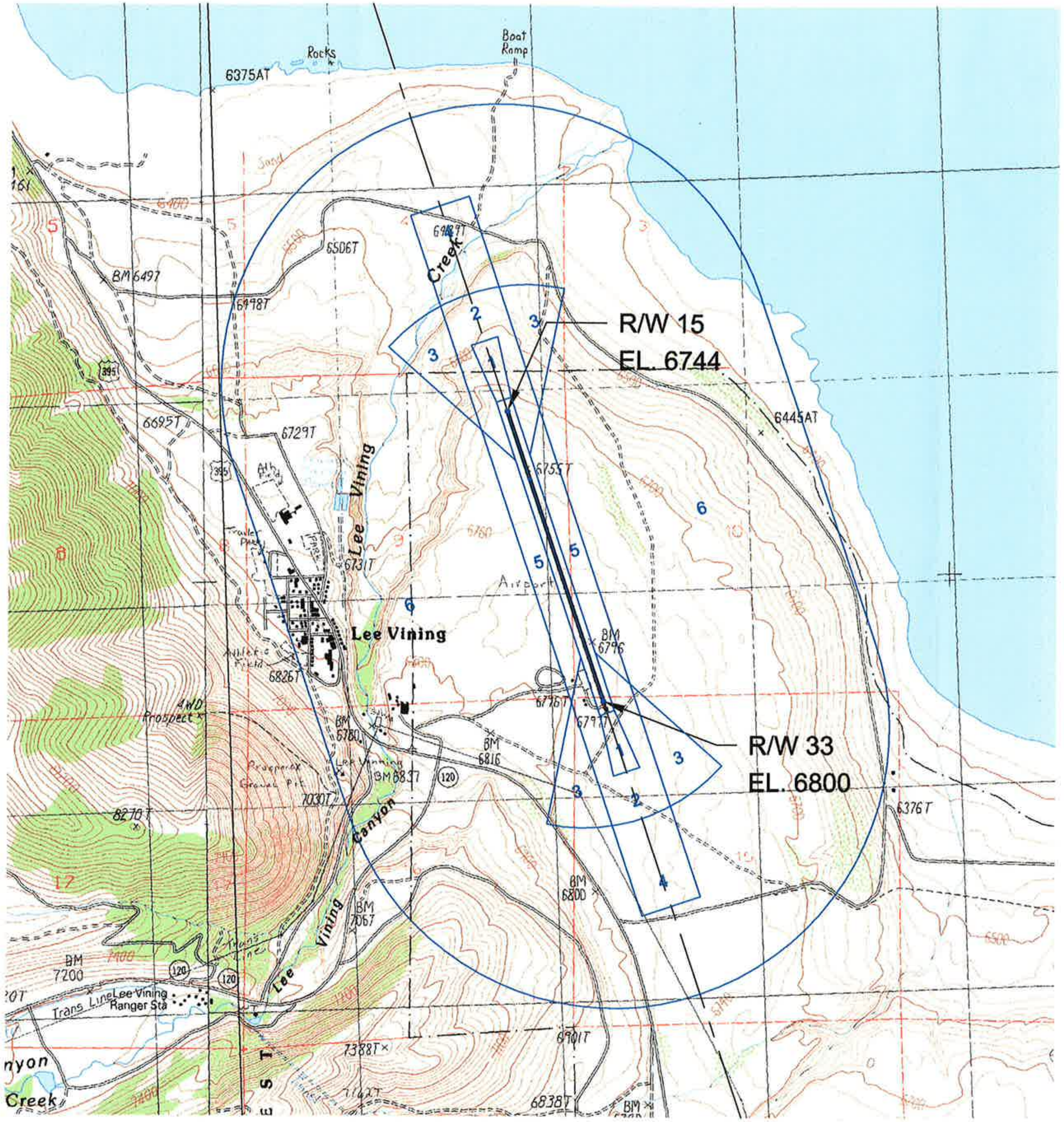
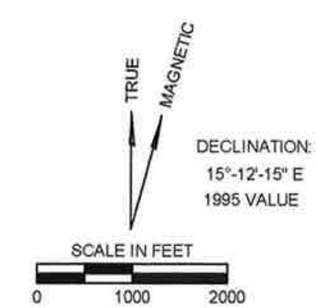


LEGEND:

1 RUNWAY PROTECTION ZONE
2 INNER APPROACH/DEPARTURE ZONE
3 INNER TURNING ZONE
4 OUTER APPROACH/DEPARTURE ZONE
5 SIDELINE ZONE
6 TRAFFIC PATTERN ZONE



NOTE: SEE CALTRANS AIRPORT LAND USE MANUAL FOR DISCUSSION.

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LEE VINING CALIFORNIA

AIRPORT LAND USE PLAN

JOB NUMBER 1302 DRAWING NUMBER 1302–ALUP

DRAWING 1 OF 1
SCALE AS SHOWN
DATE OCT 2002

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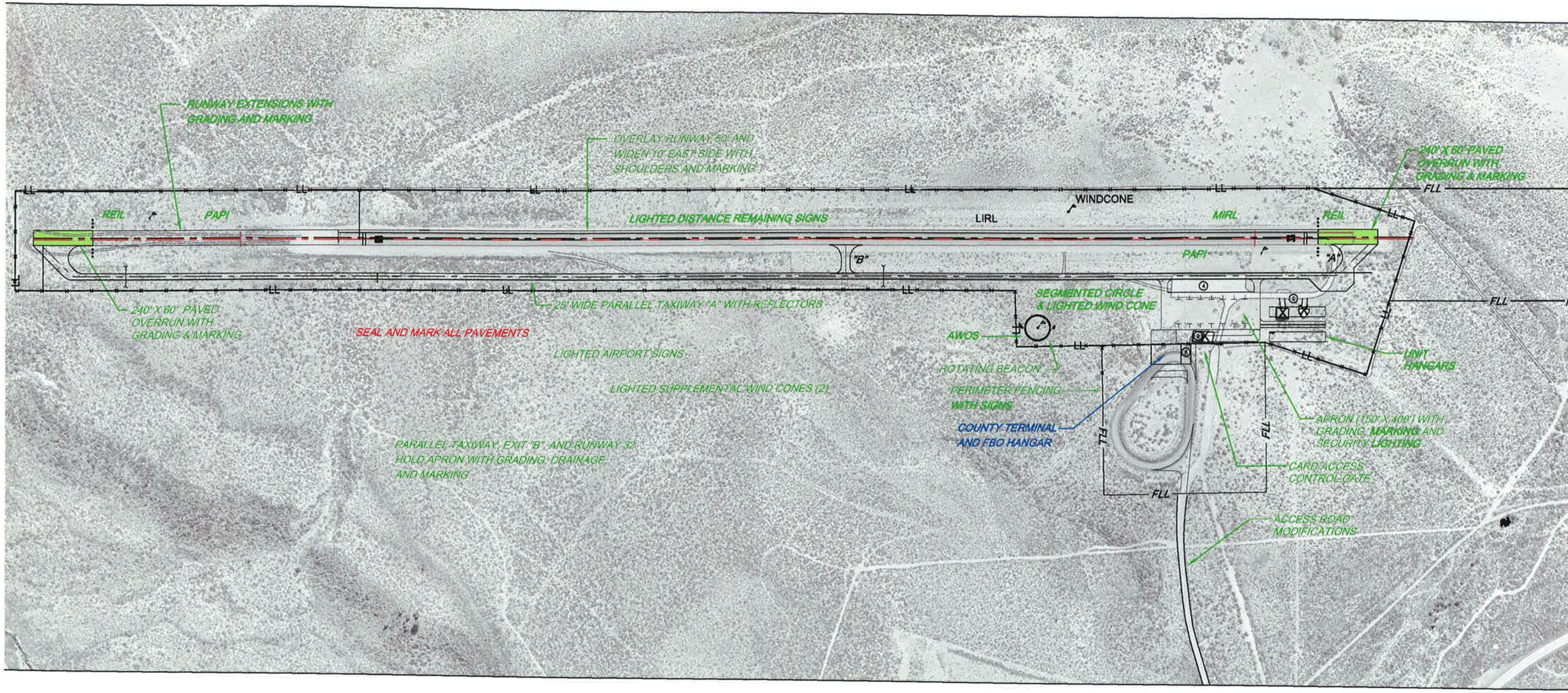
1302-LVALUP 09-30-02 (1=1) XREF: X-BRDR, USGS-H1&H2 REF: H137119, H237119



MAGNETIC
TRUE

DECLINATION:
15°-12'-15" E
1995 VALUE

SCALE IN FEET
0 200 400

Stage	Years
STAGE 1	2000 TO 2005
STAGE 2	2006 TO 2010
STAGE 3	2011 TO 2020

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A COUNTY OF MONO AVIATION FACILITY
LEE VINING CALIFORNIA

STAGE DEVELOPMENT PLAN

DRAWING 1 OF 1

NO.	DATE	BY	REVISIONS
DRAWN DLH	CHECKED RPW	DESIGNED REV	

JOB NUMBER 1302 | DRAWING NUMBER 1302–LVSDP | SCALE AS SHOWN | DATE OCT 2002

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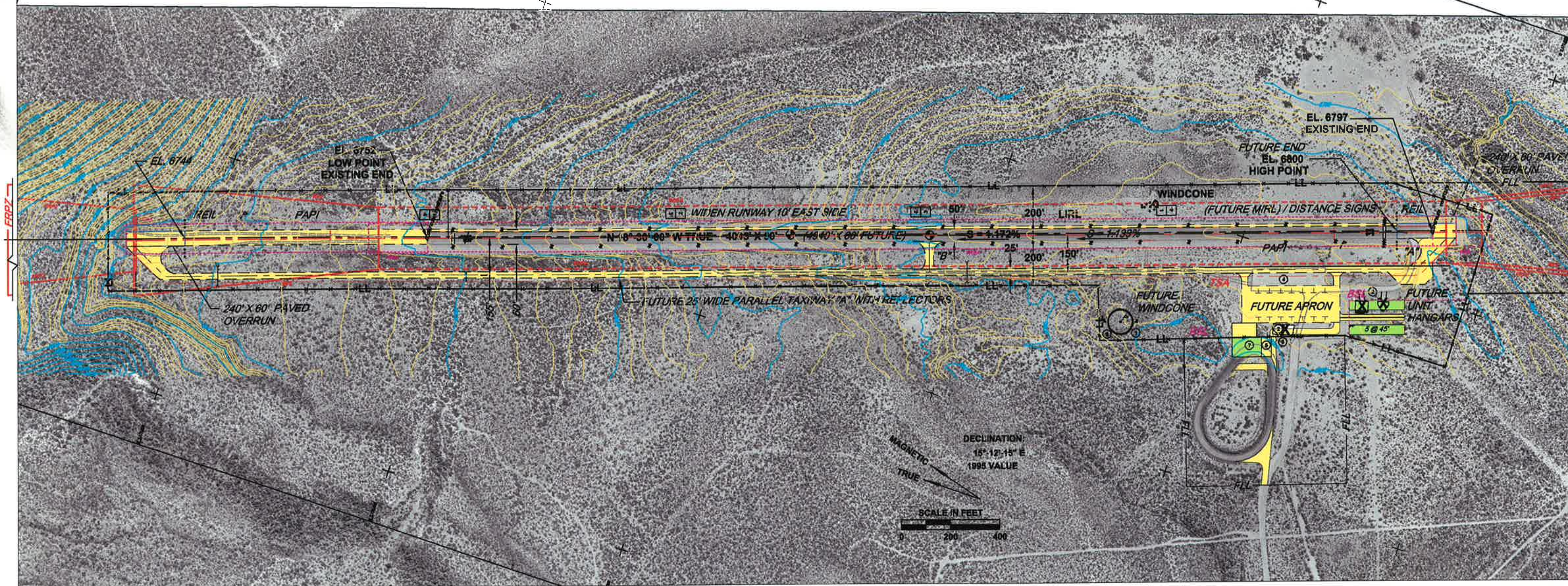
281-LV-1ALD 09-30-02 (1=1) XREF: X-BRDR, 729127LV REF: LV-ORTHO.TIF, MAP_MONO.GIF



LEGEND	EXISTING	FUTURE
AIRPORT REFERENCE POINT		
AIRPORT LEASE LINE	LL	FLL
AVIGATION EASEMENT		
BUILDING SETBACK LINE	BSL	BSL
RUNWAY SAFETY AREA	RSA	FRSA
RUNWAY PROTECTION ZONES	RPZ	FRPZ
BUILDINGS		
DRAINAGE		
FACILITIES		
FACILITY TO BE REMOVED	N/A	X
FENCE		
LIGHTING		
WIND CONE		

FACILITY DATA

1	AIRPORT BEACON
2	HANGARS
3	FBO SITES
4	APRON
5	AUTO PARKING
6	AUTOMATED WEATHER OBSERVATION SYSTEM
7	COUNTY TERMINAL / FBO
8	FUTURE CARD ACCESS GATE

AIRPORT DATA

		EXISTING	FUTURE
AIRPORT REFERENCE CODE CATEGORY		A-I	SAME
ELEVATION (MSL)		6800'	SAME
TEMPERATURE (MEAN MAX. OF HOTTEST MONTH)		84°F (E)	SAME
REFERENCE POINT COORDINATES (NAD 83)	LATITUDE	N 37°-57'-28.05"	N 37°-57'-33.40"
	LONGITUDE	W 119°-06'-21.00"	W 119°-06'-23.13"
NAVIGATIONAL AIDS		NONE	GPS
ACREAGE	LAND LEASE	69	87±
	AVIGATION EASEMENT	0	0
BASED AIRCRAFT PARKING DEMAND	TIEDOWNS	0	0
	HANGARS/SHELTERS	3	4
	TOTAL	3	4
TRANSIENT AIRCRAFT TIEDOWN DEMAND		5	10
AIRPORT RESCUE & FIRE FIGHTING INDEX (ARFF)		N/A	N/A

TAXIWAY DATA

T/W	TYPE	PAVEMENT SURFACE	PAVEMENT WIDTH		STRENGTH (1000#) SINGLE GEAR		SIGNING/ LIGHTING	
			EXISTING	FUTURE	EXISTING	FUTURE	EXISTING	FUTURE
A	PARALLEL	ASPHALT	N/A	25'	N/A	12.5	N/A	REFLECTORS
B	EXIT	ASPHALT	N/A	35'	N/A	12.5	N/A	REFLECTORS
C	EXIT	ASPHALT	N/A	60'	N/A	12.5	N/A	REFLECTORS

RUNWAY DATA

			RUNWAY 15-33	
			EXISTING	FUTURE
RUNWAY CATEGORY			A-I	SAME
RUNWAY CLASSIFICATION			UTILITY	SAME
PHYSICAL LENGTH, WIDTH, AND SURFACE			4095'x50', ASPHALT	4940'x60', ASPHALT
THRESHOLD DISPLACEMENT (D) OR RELOCATION (R)			100 / 200	NONE
EFFECTIVE GRADIENT (%)			1.172	1.133
PAVEMENT STRENGTH (1000#) SINGLE GEAR			30(E)	12.5
LIGHTING AND VISUAL AIDS			LIRL	MIRL/PAPI/REIL/SIGNS
MARKING			BASIC	SAME
CRITICAL DESIGN AIRCRAFT	RUNWAY LENGTH		C-182	SAME
	PAVEMENT STRENGTH		MU-2	SAME
	WINGSPAN		C-182	SAME
INSTRUMENT APPROACH TYPE/ RUNWAY FAR PART 77 CATEGORY	15		VISUAL	VISUAL
	33		VISUAL	VISUAL
APPROACH SLOPE: REQUIRED/CLEAR	15		20:1/60:1	SAME
	33		20:1/60:1	SAME
APPROACH & LANDING AIDS	15		NONE	GPS
	33		NONE	GPS
RUNWAY END COORDINATES (NAD 83)	15	LAT.	N 37°-57'-47.3"	N 37°-57'-56.6"
		LONG.	W 119°-06'-28.9"	W 119°-06'-32.7"
	33	LAT.	N 37°-57'-08.6"	N 37°-57'-10.2"
		LONG.	W 119°-06'-13.1"	W 119°-06'-13.6"
RUNWAY SAFETY AREA DIMENSIONS:	WIDTH		120'	SAME
	LENGTH (240' BEYOND END)		4095'	5420'
RUNWAY PROTECTION ZONE DIMENSIONS: (INNER/OUTER/LENGTH)	15		250/450/1000	SAME
	33		250/450/1000	SAME
RUNWAY OBSTACLE FREE ZONE AIRCRAFT			SMALL	SAME
WIND COVERAGE (%)	12 MPH ALL WEATHER		N/A	SAME
	15 MPH ALL WEATHER		N/A	SAME

FAA APPROVAL

COUNTY OF MONO

By: ______________ Date: __________
Richard Boardman

Title: Director of Public Works

NOTES

1. ALL AIRFIELD PAVEMENTS ARE ASPHALTIC CONCRETE.
2. SITING OF NAVAIDS AND LIGHTING AIDS SUBJECT TO FAA REVIEW AND DESIGN.
3. TOPOGRAPHY SOURCE MAY 2000 PHOTOMAPPING.
4. THE AIRPORT IS NOT SUBJECT TO FLOODING.
5. AN AIRPORT HEIGHT ZONING ORDINANCE IS IN EFFECT.
6. CLEAR SLOPES ARE BASED ON ANALYSIS OF USGS TOPOGRAPHY.
7. NO SITE SPECIFIC WIND DATA IS AVAILABLE.

LOCATION MAP

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NO.	DATE	BY	REVISIONS

LEE VINING AIRPORT

A COUNTY OF MONO AVIATION FACILITY

LEE VINING CALIFORNIA

AIRPORT LAYOUT PLAN

DRAWING 1 OF 1

SCALE AS SHOWN

DRAWN DLH CHECKED RPW DESIGNED REV JOB NUMBER 1302 DRAWING NUMBER 1302–LVALP DATE OCT 2002

1302-LVALD 10-01-02 (1=1) XREF: X-BRDR, 729127LV REF: LV-ORTHO.TIF, MAP_MONO.GIF

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