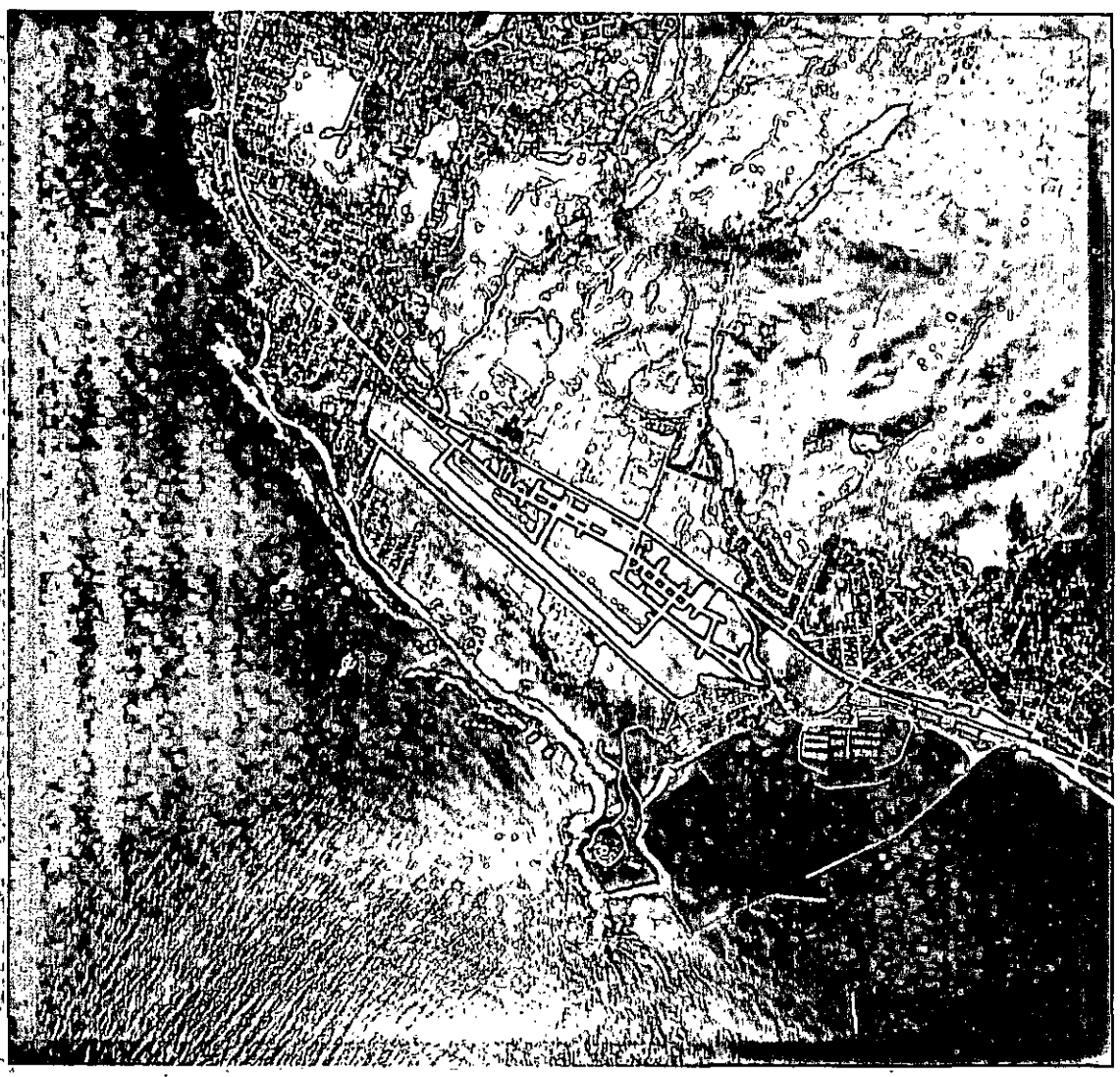
HALF MOON BAY AIRPORT

SAN MATEO COUNTY



AIRPORT MASTER PLAN

AIRPORT MASTER PLAN

for

HALF MOON BAY AIRPORT

PREPARED FOR THE

COUNTY OF SAN MATEO, CALIFORNIA

ACCEPTED BY THE COUNTY BOARD OF SUPERVISORS ON

JULY 22, 1997

PREPARED BY

COFFMAN ASSOCIATES, INC.

"The preparation of these documents was financed in part through a grant from the DOT/FAA as provided in the Airport and Airway Improvement Act of 1982, as amended by the Airport and Airway Safety and Capacity Act of 1987. The contents of these documents reflect the views of Coffman Associates, Inc., which is responsible for the parts and accuracy of the data contained herein. The contents do not necessarily reflect the official views or policy of the FAA. Acceptance of these documents by the FAA does not in any way constitute a commitment on the part of the United States to participate in any development depicted herein nor does it indicate that the proposed development is environmentally acceptable in accordance with Public Law 90-495, 91-190, 91-258, 94-353, and/or 100-233."

CONTENTS

HALF MOON BAY AIRPORT
County of San Mateo, California

Airport Master Plan

CHAPTER ONE
INVENTORY (Continued)

CHAPTER TWO
AVIATION DEMAND FORECASTS

CHAPTER THREE
FACILITY REQUIREMENTS

CHAPTER THREE
FACILITY REQUIREMENTS (Continued)

CHAPTER FOUR
DEVELOPMENT ALTERNATIVES

CHAPTER FIVE
AIRPORT PLANS

CHAPTER FIVE
AIRPORT PLANS (Continued)

CHAPTER SIX
FINANCIAL MANAGEMENT
AND DEVELOPMENT PROGRAM

EXHIBITS

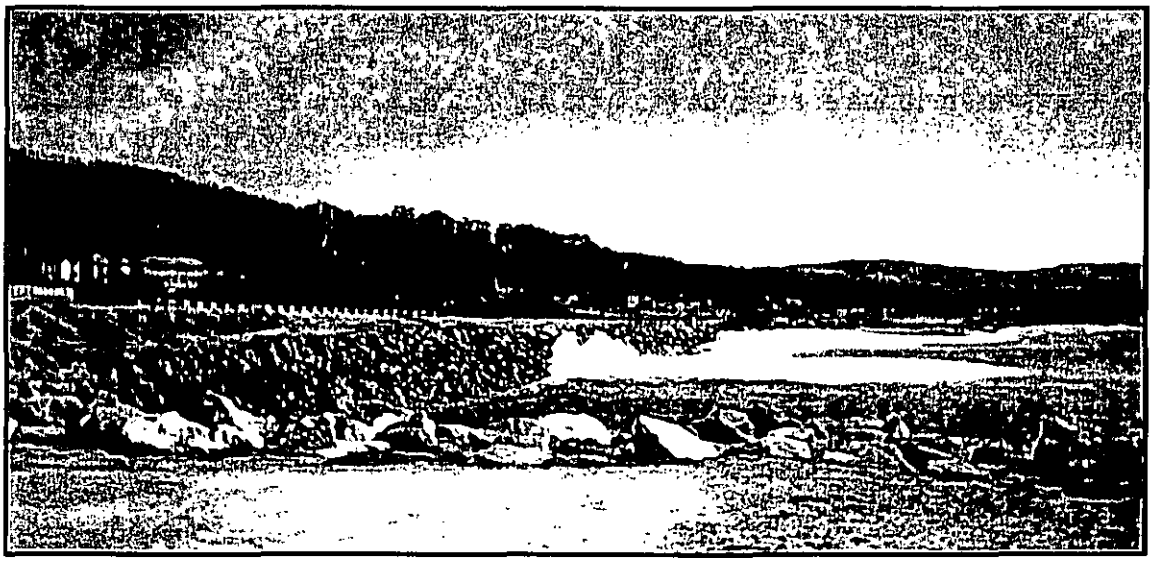
EXHIBITS (Continued)

APPENDICES

SAN MATEO COUNTY
AIRPORTS
HALF MOON BAY

INTRODUCTION

INTRODUCTION



The Half Moon Bay Airport Master Plan is being financed as a cooperative effort between the Federal Aviation Administration (FAA) and the County of San Mateo. The master plan is a comprehensive analysis of airport needs and alternatives with the purpose of providing direction for the future development of this facility.

The Master Plan for Half Moon Bay Airport must address the specific needs of the airport, evaluate its role within the regional aviation system and recommend future development projects. The County of San Mateo recognizes the importance of aviation in long-term planning and the associated challenges inherent in providing for future aviation needs. With a sound and realistic Master Plan, Half Moon Bay Airport will continue its role as both an economic asset and a source of pride to the residents around the Airport.

AVIATION CLASSIFICATIONS

The FAA currently defines three broad categories of aviation activity: general aviation, air carrier, and military. Air Carriers are those airlines which provide scheduled carriage of passengers or freight under restricted permits issued by the FAA. Air Carriers may be divided into two major groupings.

- **Certificated Route Air Carriers** - An air carrier engaged in interstate or overseas transportation under a Certificate of Public Convenience an Necessity issued by the Department of Transportation (DOT). Certain non-scheduled or charter operations may also be conducted by these carriers, all passenger carriers, and combination carri ers operating under Federal Aviation Regulation (FAR) Part 121 certificates.

- **Air Taxi or Commercial Operators** - Operators of airplanes with maximum seating (excluding pilot) of 30 passengers or a maximum payload capacity of more than 7,500 pounds. They operate under FAR Part 135 certificates.

General aviation includes every type of civil flying other than certificated air carriers and military. General aviation flying or usage falls into four major categories:

- **Business** - The use of an aircraft for executive or business transportation. This category consists of aircraft used by an organization and operated by professional pilots to transport its employees and property (not for compensation or hire), and aircraft used by an individual for transportation required for his or her business.

- **Commercial** - The use of an aircraft for commercial purposes (other than the commuter and air carrier), including: air taxi, aerial application, special industrial usage, aerial surveys, advertising, aerial photography, and emergency medical transportation.

- **Instructional** - The use of an aircraft for flight training under the supervision of an instructor.

- **Personal** - The use of an aircraft for a variety of personal reasons.

General aviation is the largest and the most significant element of the national air transportation system. According to the National Plan of Integrated Airport Systems (NPIAS) 1990-1999, general aviation aircraft constitute 98 percent of all aircraft in use today. Certificated airlines serve fewer than 700 airports in the country, while there are over 16,000 general aviation airports in the country. General aviation provides the time saving link for corporate travel that has made the shift to smaller communities feasible and extremely attractive.

STUDY OBJECTIVES

Because the airport belongs to the public and is intended to serve the entire region, a comprehensive analysis of the airport and the surrounding area will be made. To accomplish the objectives of this study, the Master Plan will supply the following analyses.

- **Inventory of Existing Conditions** - Assemble and organize relevant information and data on Half Moon Bay Airport and the surrounding area.

- **Aviation Forecast** - Develop detailed projections of future air traffic, by quantity and type.

- **Facility Requirements** - Identify the facility requirements needed to meet projected demands for the airport for existing, short, intermediate, and long term time frames.

- **Airport Alternatives** - Produce concepts of the various alternatives for airport development.
- **Airport Layout Plan** - Refine the recommended airport development

concept into the airport's plan for development.

- **Financial Plan** - Prepare a capital improvement program to assist in the implementation of the recommended development plan. Establish development priorities, schedule proposed development items, and estimate development costs.

One of the most important elements of the planning process is the direct involvement of those parties who could potentially be most affected by the results of the study. This is accomplished through the use of a Planning Advisory Committee (PAC), which reviews the work of the study team. In addition, three public information workshops will be held prior to the completion of the Master Plan Study, providing the public with an opportunity to understand the planning process as well as present comments or concerns. With the assistance of local input, the Master Plan for Half Moon Bay Airport will reflect the necessary future development needed to meet the growing aviation demands of the County of San Mateo.

THE AIRPORT'S ROLE

Currently, Half Moon Bay Airport is classified by the FAA as a Reliever Airport. General aviation reliever airports are those airports which provide traffic relief to a commercial service airport in the area, thereby, reducing congestion at metropolitan commercial service airports. In the case of Half Moon Bay Airport, the relieved airport is San Francisco International Airport.

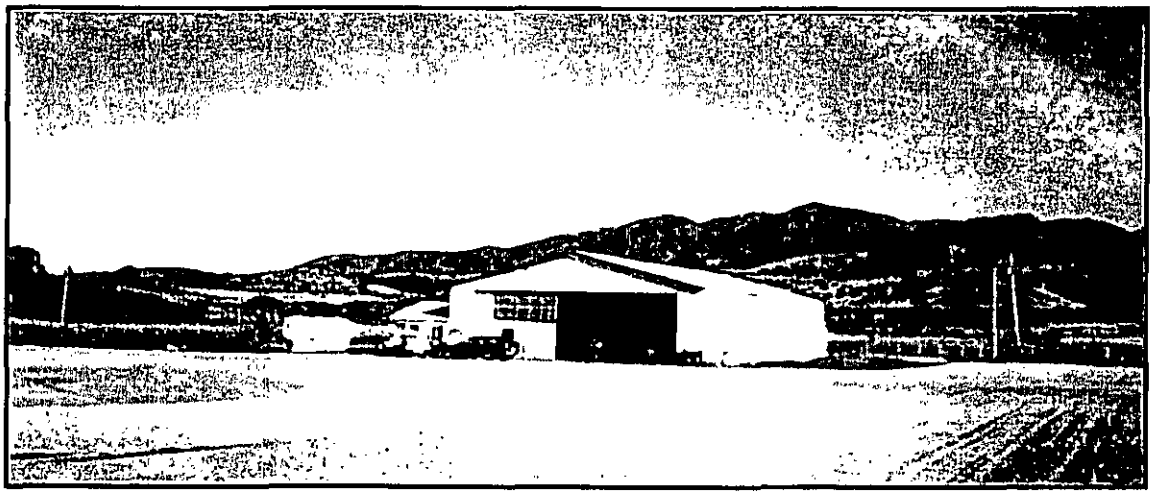
This Master Plan study will examine and consider all of the activities currently taking place at Half Moon Bay Airport and strive to produce a plan that will support all future anticipated airport activities, and meet the needs of both the community and the region.

SAN MATEO COUNTY
AIRPORTS
HALF MOON BAY

INVENTORY

HALF MOON BAY AIRPORT

INVENTORY



The development of an Airport Master Plan for Half Moon Bay Airport requires the collection and evaluation of various data related to the airport, the community and the surrounding area. This information includes the following.

- Physical inventories and descriptions of facilities and services provided at the airport.
- A review of historical air traffic activity and air traffic procedures at Half Moon Bay Airport, and an assessment of local airspace conditions.
- The compilation of background information pertaining to the airport, the Coastside region of San Mateo County, the City of Half Moon Bay, and the surrounding region.
- The compilation of population, employment and other socioeconomic statistics which might provide an indication of future growth in the area.
- A comprehensive review of the existing local, regional and state plans and studies to determine their potential influence on the airport.

An accurate and complete inventory is essential to the success of the master plan study. The findings and recommendations made in the master plan are heavily dependant on the information collected during the inventory; therefore, the information collected must be as reliable and up-to-date as possible. The information summarized in this chapter was obtained through on-site investigations of the airport and interviews with airport management, representatives of the County of San Mateo, the City of Half Moon Bay, airport businesses, and the Federal Aviation Administration (FAA). Additional information was collected from historical records, available documents and studies concerning local communities and Half Moon Bay Airport.

AIRPORT SETTING

Half Moon Bay Airport (HAF) is located in northwestern San Mateo County, adjacent to the unincorporated communities of El Granada, Moss Beach and Princeton-by-the-Sea. The airport consists of approximately 345 acres and is situated approximately four miles north of the City of Half Moon Bay, between the Pacific Ocean and Montara Mountain, part of the Santa Cruz Mountains. The airport is generally bounded by the Cabrillo Highway (a part of the Pacific Coast Highway) on the east, Cypress Avenue in Moss Beach on the north, Airport Street on the west, and Capistrano Road on the south. The airport's general aviation terminal building is located on the east side of the airport and is accessed from the Cabrillo Highway. El Granada, Moss Beach and Montara are primarily residential areas. Princeton, located south of the airport, is comprised of commercial and light industrial uses, with a few residences. The James V. Fitzgerald Marine Reserve is located along the Pacific coastline, northwest of the airport. **Exhibit 1A, Vicinity Map**, illustrates Half Moon Bay Airport and its environs.

CLIMATE

Half Moon Bay Airport experiences dry mild summers and moist cool winters with an annual mean temperature of 55 degrees. The mean average maximum and minimum temperatures are 62 degrees and 47 degrees, respectively. The month of January is generally the coolest month with high temperatures in the fifties and lows in the thirties. The summer months are generally mild with morning fog and afternoon ocean winds.

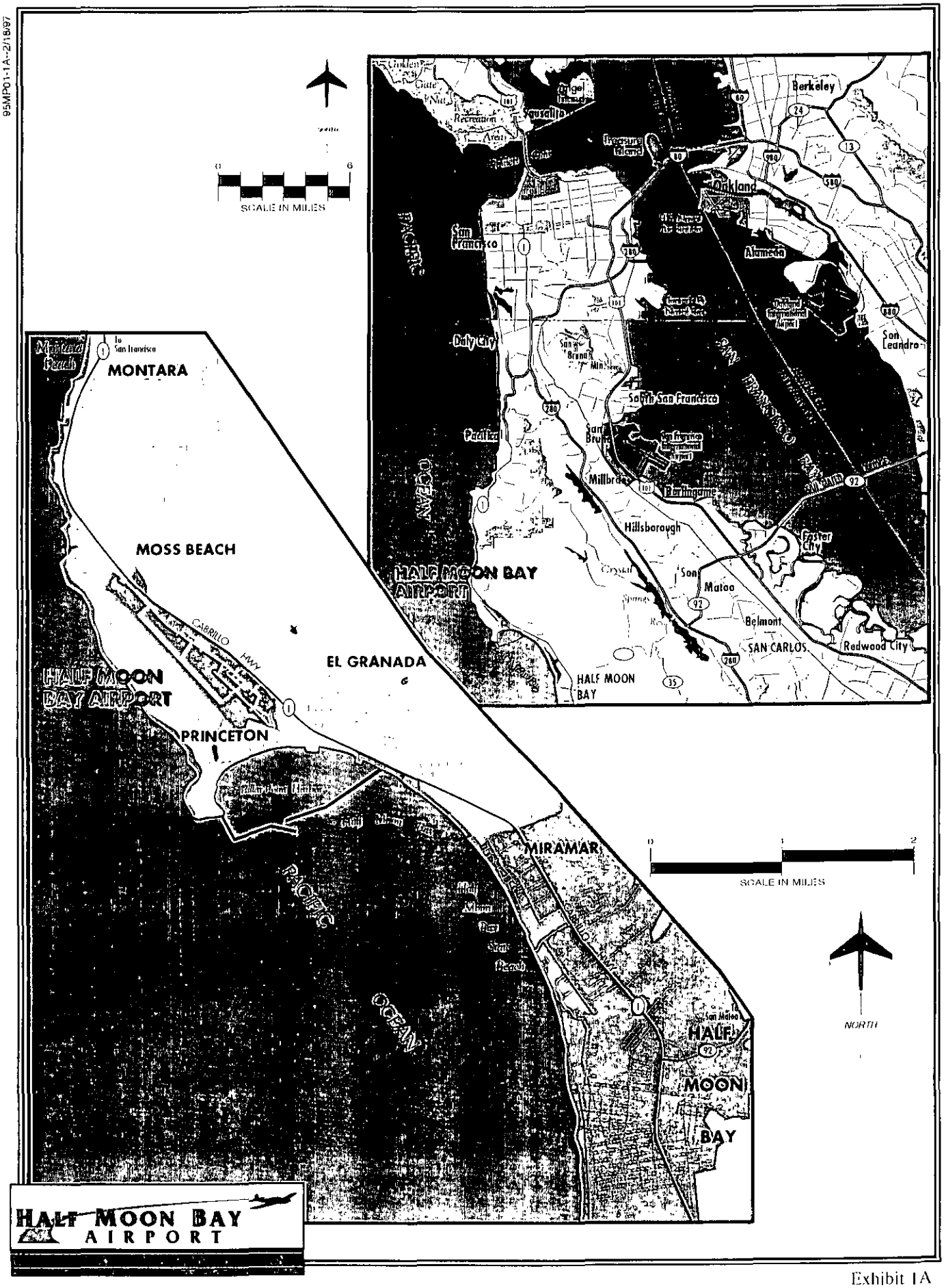
The prevailing winds are out of the northwest and are generally light to moderate. In the months of March, April and May, the west winds generally intensify. According to users of the airport, the winds associated with the area warrant the use of Runway 30 during 80 percent of the year while Runway 12 is used the remaining 20 percent of the year.

The flight conditions in the area are generally effected by the foggy conditions associated with the months between June and October. Users of the airport estimate that Visual Flight Rule (VFR) conditions occur approximately 75 percent of the year, while the remaining 25 percent of the year is in Instrument Flight Rule (IFR) conditions. VFR conditions exist when flight visibility is three miles or greater and the cloud ceiling is at least 1,000 feet above the ground. When local weather conditions become less than VFR, it would be considered to be IFR conditions.

HISTORICAL PERSPECTIVE

The historical development and activity at an airport can provide valuable insight to the airport's genesis. The following two sections outline the development history and activity associated with Half Moon Bay Airport.

95MP01-1A--2/18/97



HALF MOON BAY AIRPORT

Exhibit 1A
VICINITY MAP

AIRPORT DEVELOPMENT REVIEW

Half Moon Bay Airport was constructed in 1942 by the California State Highway Department for the U.S. Army under the Defense Highway Act of 1941. The Army made extensive improvements to the airfield before turning it over to the U.S. Navy after World War II. The Navy used the field for coastal surveillance operations until 1947 when the airfield was declared surplus. The County then acquired approximately 218 acres for use as a public use airport. In 1956 the County acquired an additional 109 acres from the State Highway Department, again with a caveat that it be restricted to use as a public use airport, in perpetuity. In 1960, the County acquired approximately 17 acres for protection of the clear zones.

Since the County acquired the airport, numerous airport improvements have been accomplished. These projects include apron overlay and reconfiguration, electrical and airfield lighting improvements, and clearing and grading of runway safety areas.

Between 1958 and 1971, Half Moon Bay Airport was used as an alternate landing site for commercial aircraft flying into San Francisco International Airport (SFO), when weather conditions at SFO did not permit landings. In the early 1970's, technical advances in instrument flying and the approval of instrument approaches into SFO eliminated the need for commercial aircraft to utilize Half Moon Bay Airport.

HISTORICAL AIRPORT ACTIVITY

Before forecasting future activity levels at Half Moon Bay Airport it is necessary to evaluate the historical numbers of operations and the types of aircraft based at and using the airport.

Half Moon Bay Airport currently serves general aviation activity. General aviation includes every type of civil flying other than commercial (defined as scheduled passenger and/or freight service regulated by the FAA) or military operations.

The available historical data for based aircraft and total operations were obtained from historical FAA and County records. A based aircraft is generally defined as an aircraft that the owner stores at a specific airport; an operation is defined as any takeoff or landing performed by an aircraft. At airports that do not have an airport traffic control tower, such as Half Moon Bay Airport, actual airport activity data is not always available; in these cases, historical records of activity are typically estimates.

According to the 1975 Airport Master Plan, the 1973 based aircraft and operational levels at Half Moon Bay Airport were estimated as 44 and 80,000, respectively. The 1992 California Aviation System Plan (CASP) estimated the 1991 number of based aircraft to be 91 and the operational level to be 61,000. In 1993, the California Department of Transportation, Division of Aeronautics,

completed a statistical sampling of aircraft operations at Half Moon Bay Airport. The number of annual operations determined from this evaluation was 38,271. Currently, the County has 66 based aircraft registered at Half Moon Bay Airport.

EXISTING AIRPORT FACILITIES

An airport is generally divided into three distinct types of facilities: airside, landside and support. The airside facilities consist of the runway and taxiway system as well as lighting aids and navigational aids. The landside facilities consist of terminal buildings, hangars, tiedowns, auto parking areas, etc. Airport support facilities include utilities, maintenance and fuel storage trucks/ tanks. Each of these three facility areas are further described in the following sections.

AIRSIDE FACILITIES

The airside facilities at Half Moon Bay Airport include the runway, taxiways, navigational aids, and visual aids. **Exhibit 1B, Existing Facilities**, identifies the locations of the various airside facilities.

Runway 12-30

Half Moon Bay Airport is situated at an elevation of 67 feet mean sea level (MSL) and consists of a single runway. Runway 12-30 is oriented northwest-southeast and is 5,000 feet in length and 150 feet in width. According to the February 1995, *Department of Commerce/National Oceanic and Atmospheric Administration (DOC/ NOAA) Airport/Facility Directory*, the runway is constructed of asphalt-concrete and has a weight capacity of 30,000 pounds single-wheel loading (SWL), 200,000 pounds dual-wheel loading (DWL), and 360,000 pounds dual-tandem wheel loading (DTWL). The County has established an administrative weight restriction of 12,500 pounds SWL. No aircraft greater than 12,500 pounds SWL can operate at Half Moon Bay Airport without prior permission from airport administration. The runway has a runway gradient of 0.75 percent sloping upward to the northwest. Both runway ends have a threshold displacement of 763 feet.

Taxiways/Taxilanes

Taxiway/taxilane systems are provided to facilitate aircraft movement between the runway system and the landside facilities. The primary taxiway (Taxiway D) at Half Moon Bay Airport is a semi-parallel taxiway located east of Runway 12-30. This taxiway extends beyond each runway end and is connected to the runway at three points: the two runway ends and at approximately midfield. At the northern end of the runway, the centerline of the taxiway is approximately 535 feet from the centerline of the runway, at midfield the taxiway is approximately 850 feet from the runway, and at the southern end the taxiway is approximately 1,250 feet from the centerline of the runway. A number of stub taxiways, original to the

55MP201-1B-2/18/97

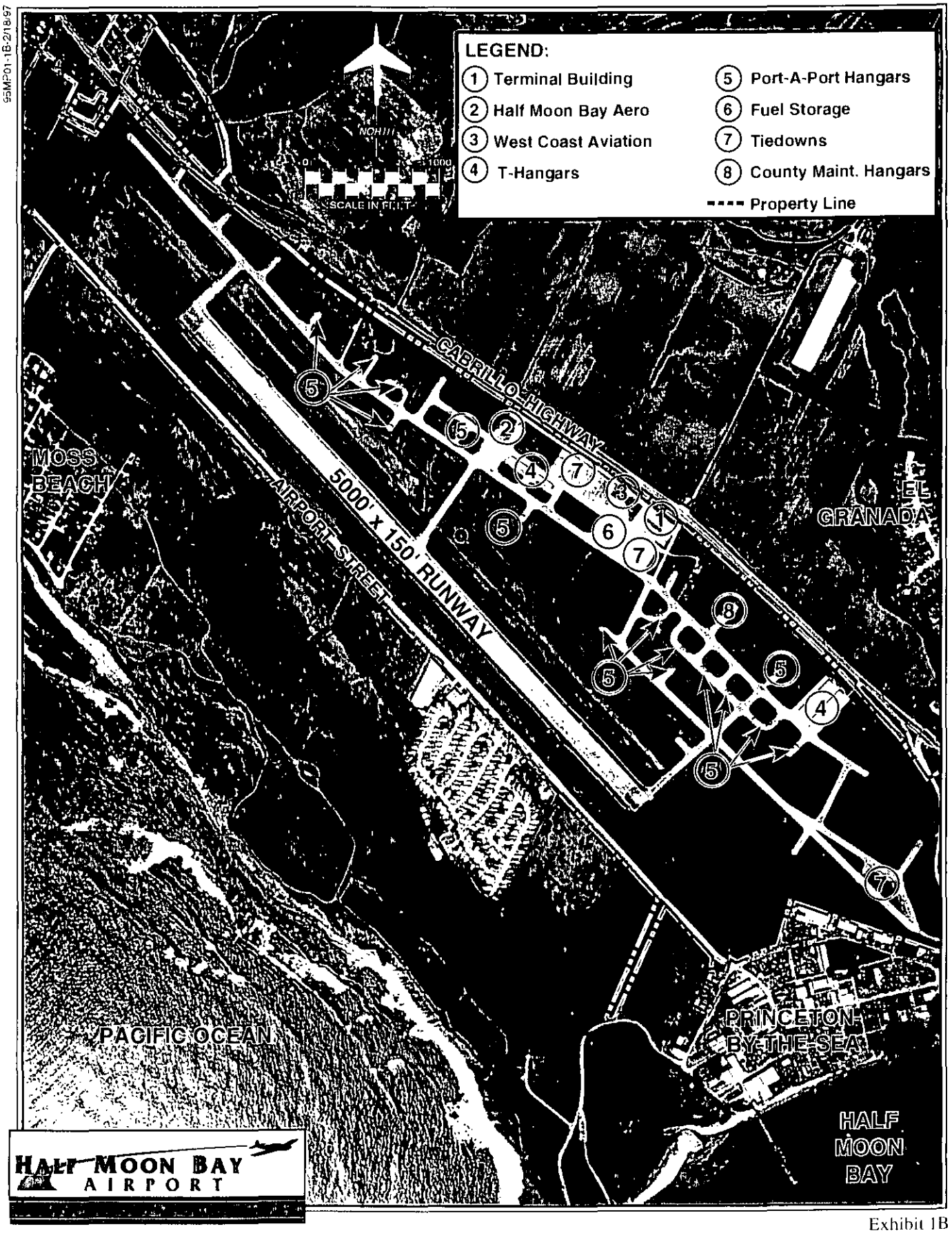


Exhibit 1B
EXISTING FACILITIES

Army Air Field, extend off of the semi-parallel taxiway. Many of these stub taxiways are used as locations for individual port-a-port hangars.

A partial-parallel taxiway, often referred to as the "old dragstrip", is located between the semi-parallel taxiway and the runway at the southern end of the airfield. In the past, this pavement was utilized for drag races. Currently, the County Sherrif's department uses this area to provide drivers training courses to law enforcement officers.

The partial-parallel taxiway centerline is approximately 750 feet east of Runway 12-30's centerline and is used primarily to provide access to the transient aircraft parking apron located adjacent Princeton-by-the-Sea. This partial-parallel taxiway also contains some stub taxiways used as access to individual port-a-port hangars.

All of the taxiways except for the midfield taxiway are approximately 50 feet in width and have the same pavement strength as the runway. The midfield taxiway has a pavement strength of 12,500 pounds.

Lighting and Markings

A variety of lighting and marking aids are available at Half Moon Bay Airport to facilitate airport identification, approaches and departures. These systems are categorized by function and are further described in the following sections.

Identification Lighting

The location and presence of an airport is universally indicated by an airport beacon. A civilian airport beacon is equipped with an optical system that projects two beams of light: one green and one white. At Half Moon Bay Airport, the airport beacon is located on the east side of the airport, northwest of the terminal building.

The airport is also equipped with three windcones on the east side of the runway: one on each runway end and at midfield. The midfield windcone is lighted and is located within the airport's segmented circle.

Runway and Taxiway Lighting

Runway 12-30 is equipped with Medium Intensity Runway Lights (MIRL) which outline the runway with white lights. In addition, threshold lighting is provided to identify the displaced threshold at each runway end. The runway lights are activated by photo cell at night at which time they are pilot controlled and can be adjusted to either low, medium or high intensity by keying the aircraft micro-phone.

The three connecting taxiways are equipped with Medium Intensity Taxiway Lights (MITL) which outline the taxiways with blue lights. Neither the semi-parallel nor the partial-parallel taxiway are currently equipped with taxiway lights. The installation of MITLs is expected to be completed by in late 1996 or early 1997.

Approach Lighting

Runway 30 is equipped with a four-box Visual Approach Slope Indicator (VASI-4) lights on the left side of the approach end of the runway. VASI-4's consist of two-color, high-intensity, focused lights at predetermined angles to provide visual descent guidance information to the pilot during the final approach to the runway. According to the February 1995, *DOC/NOAA Airport/Facility Directory*, the VASI at Half Moon Bay Airport is set at a 3.0 degree glide slope.

Runway 30 is also equipped with Runway End Identifier Lights (REILs). REILs are high-intensity, white strobe lights that provide the pilot with positive identification of the runway threshold. These lights are particularly useful during periods of poor visibility conditions and at night.

Pavement Markings

Pavement markings are used on runway and taxiway surfaces to identify a specific runway, runway threshold, centerline, holdline, or edge line. Runways are marked with white markings in accordance with the type of approach available (visual, nonprecision, or precision) to each runway end. At Half Moon Bay Airport, each runway end is marked with visual approach markings. The markings include runway designation, centerline, edge, displaced threshold, and aiming point. In addition, the taxiways and taxilanes at Half Moon Bay Airport are marked with yellow centerline markings.

Navigational Aids

Navigational aids (navaids) provide direction, range and/or position information to pilots. Navaids are usually classified as either *enroute* or *terminal*. The enroute navaids provide point-to-point navigation, while the terminal navaids provide approach and landing guidance. Some navaids serve as both enroute and terminal navaids.

Enroute Navaids

Enroute navaids are comprised of two basic types of equipment, the VOR (very high frequency omnidirectional range) and the VORTAC (VOR/tactical air navigation). The VOR provides bearing (direction) information to pilots while a VORTAC produces both bearing and distance information. The VOR is commonly linked with a DME (distance measuring equipment) to provide nearly identical service as the VORTAC. The VOR transmits radio signals every degree to provide 360 individual courses from the transmitting facility. Both DME and TACAN (tactical air navigation system) provide slant-range to the station in nautical miles (NM). The VOR, a VHF (very high frequency) facility and the TACAN, a UHF (ultra high frequency) facility, are limited to line-of-sight transmissions; their ranges are affected by the altitude of the aircraft.

The nearest enroute navaid to Half Moon Bay Airport is the San Francisco VOR-DME which is located approximately 9 NM northeast of the airport. The Woodside VORTAC is located approximately 12.5 NM southeast of the

airport. **Exhibit 1C, Airspace**, graphically depicts the location of these enroute navigational aids in relation to Half Moon Bay Airport.

Terminal Area Navaids

Terminal area navaids are those located at or in proximity to the airport and serve to assist the pilot in flying an appropriate direction or glidepath to the runway end. There are no terminal area navaids available at Half Moon Bay Airport.

LANDSIDE FACILITIES

In addition to the airside facilities, landside facilities are essential to the daily operation of Half Moon Bay Airport. Landside facilities primarily consist of those facilities required to accommodate aircraft, pilots and passengers while they are at the airport. Landside facilities typically consist of terminal buildings, FBO facilities, aircraft parking apron, hangars, and automobile parking. At Half Moon Bay Airport, the landside facilities are located on the east side of Runway 12-30.

Terminal Building

The existing terminal building is located east of Runway 12-30, along the semi-parallel taxiway. The terminal building is an approximately 4,000 square foot, single-story structure built in the late 1950's. In addition to housing the airport administration office, it also contains the 30 Cafe restaurant, the Mid Coast Community Council office, and a County Sheriff's Substation. The terminal building is also used as a community meeting place. Auto parking spaces are available in front of the terminal building.

Fixed Based Operators (FBOs)

There are two businesses at Half Moon Bay Airport which may be classified as fixed based operators (FBOs). FBO's typically provide a wide variety of aircraft and pilot services, including aircraft maintenance, air taxi and pilot training. Pilot training, however, is not currently available at Half Moon Bay Airport through an FBO.

West Coast Aviation Company

West Coast Aviation has operated out of Half Moon Bay Airport since 1949, when the airport was first turned over to the County. Currently, this FBO provides annual inspections, major aircraft engine repairs and maintenance, airframe repairs and fabric work. West Coast Aviation operates out of a 7,200 square foot conventional hangar and supports the owner and one part-time employee.

Half Moon Bay Aero

Half Moon Bay Aero also provides annual aircraft inspections and some aircraft maintenance. Primarily, however, its service is in rebuilding aircraft. Half Moon Bay Aero operates out of a 7,500 square foot conventional hangar and supports one owner/employee.

Apron and Aircraft Parking Areas

There are three apron areas at Half Moon Bay Airport which provide tiedowns for aircraft. One transient apron is located in front of the terminal building, a based aircraft apron is located on the north side of West Coast Aviation and the second transient apron is located on the southern end of the airport, near Princeton-by-the-Sea. Few based aircraft currently utilize the tiedowns due to the corrosive salt air. The based aircraft apron next to West Coast Aviation is also used as a temporary roller hockey facility. The terminal area apron, north apron, and Princeton apron support 12, 29 and 10 marked tiedowns, respectively.

Hangars and Other Buildings

In addition to the two conventional hangars utilized by the FBOs, Half Moon Bay Airport supports a number of additional standard hangars and port-a-port hangars.

At approximately midfield, near West Coast Aviation, are 12 county-owned but privately managed T-Hangars. In general, these hangars appear to be in poor condition.

On the south end of the airfield the County currently owns and maintains 28 standard hangars. Airport management leases 27 of the hangars for aircraft storage. One hangar is used for the storage of county equipment. These hangars appear to be in good condition.

Scattered along the length of both the partial-parallel and semi-parallel taxiways are port-a-port hangars, totaling 18 standard size and three (3) executive size hangars. These port-a-ports are used for general storage or aircraft storage. In general, the port-a-port hangars are in poor condition due to the corrosive salt air. Two of these hangars are currently used for storage due to their poor condition.

Two small conventional hangars located south of the terminal building. One hangar is used by the Sherriff's department and the other for storage of airport maintenance equipment.

Automobile Parking

There are approximately 60 marked automobile parking spaces located adjacent to the terminal building. These are the only delineated parking spaces at Half Moon Bay Airport, however, additional pavement in this area provides for additional auto parking. Vehicles have access to the airfield through a security gate located just south of the terminal building. Owners and operators of the businesses and aircraft at the airport park their vehicles near their respective hangars.

AIRPORT SUPPORT FACILITIES

Airport support facilities are those that are not classified as either airside or landside, but which play an important role in the function of Half Moon Bay Airport. Maintenance, available utili-

95MP01-1C-2/18/97

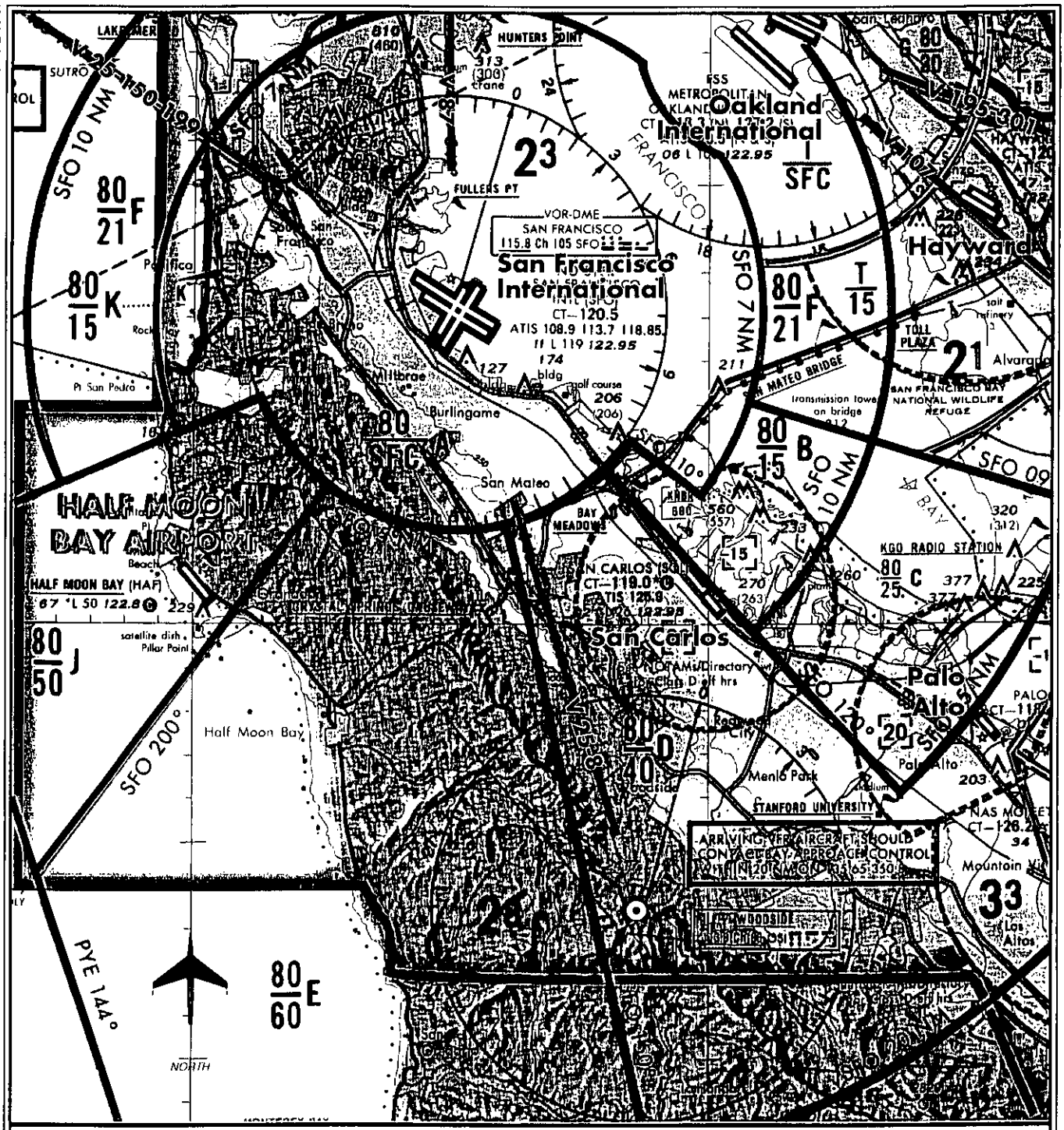


Exhibit 1C
AIRSPACE

ties, firefighting, and fueling facilities are four areas which were reviewed.

Maintenance

San Mateo County provides maintenance support for Half Moon Bay Airport primarily with airport staff and through its Department of Public Works. This includes both pavement repair and airfield and building maintenance.

Firefighting

The nearest San Mateo County fire station is located within five (5) minutes travel time of Half Moon Bay Airport, south on the Cabrillo Highway. In addition, the airport is currently equipped with a utility truck which contains 90 seconds worth of firefighting chemicals for initial response. Because the airport does not have commercial operations, it is not required to maintain an Aircraft Rescue and Firefighting (ARFF) Index rating.

Fuel Storage Facilities

Existing fuel storage facilities at Half Moon Bay Airport currently consist of two (2) 10,000 gallon underground storage tanks for AvGas. The fuel from these tanks is distributed from a fuel pump located at the fuel island on the terminal apron.

The County plans to replace these underground tanks with an above ground, self-service tank in the near future, subject to all appropriate regulations.

Utilities

The availability of utilities serving Half Moon Bay Airport is an important factor in determining the development potential of the airport property. Of primary interest in the area of the airport is the availability of public water, sanitary sewer, electricity, and storm sewer. Utilities at Half Moon Bay Airport are provided in the following manner.

- Public Water -- Potable water to the surrounding community and the airport is provided by Citizens Utilities via three public water supply wells. These three wells are all located along the eastside of Cabrillo Highway, near the terminal building.

- Sanitary Sewer -- Sanitary sewage at Half Moon Bay Airport is currently treated on-site in an underground septic system.

- Electricity -- Pacific Gas and Electric supplies electricity to the airport through transmission lines located along the Cabrillo Highway and the frontage road.

- Storm Sewer -- Stormwater from the airport is directed into a drainage channel located between the runway and the semi-parallel taxiway. Eventually, the stormwater either infiltrates into the ground, or finds its way into Pillar Point Marsh (on the southwest side of the airfield).

- Solid Waste Disposal – Refuse from Half Moon Bay Airport is currently taken to Ox Mountain, located approximately eight (8) miles from the airport.

AIRSPACE AND AIR TRAFFIC CONTROL

An analysis of the airspace structure in the vicinity of Half Moon Bay Airport is necessary to determine the operational interaction among various types of airspace and airspace users. Flights in and out of the airport are currently conducted using Visual Flight Rules (VFR). VFR conditions exist when flight visibility is three miles or greater and the cloud ceiling is at least 1,000 feet above the surface. Currently, Half Moon Bay Airport does not have the instrumentation to provide for Instrument Flight Rules (IFR) operations. IFR conditions exist when weather conditions are below VFR conditions.

Half Moon Bay Airport does not have an airport traffic control tower; therefore, no formal terminal air traffic control services are available. Air traffic advisories and weather information services are provided by an on-airport Unicom operator. The terminal and enroute air traffic control services are provided through Bay Approach Control and the Oakland Air Route Traffic Control Center (ARTCC).

The airspace around Half Moon Bay Airport is depicted on **Exhibit 1C**, provided earlier. Given the proximity of the Pacific Ocean on the west and the mountains on the east, there are a limited number of airports in the immediate vicinity of Half Moon Bay Airport.

AREA AIRPORTS

There are six airports located within a 20 NM range of Half Moon Bay Airport. The following five airports are public: San Francisco International, San Carlos, Oakland International, Palo Alto, and Hayward. The sixth airport is the Alameda Naval Air Station (NAS Alameda). **Table 1A, Area Airports**, provides detailed information about each of these public airports.

TABLE 1A
Area Airports

Public Airports	Runway(s)	Dimensions (feet)	Location
San Francisco International	10L-28R 10R-28L 01R-19L 01L-19R	11,870x200 10,600x200 8,901x200 7,001x200	9 NM NE
San Carlos	12-30	2,600x75	12NM E
Oakland International	11-29 09R-27L 09L-27R 15-33	10,000x150 6,212x150 5,453x150 3,366x75	19NM NE
Palo Alto	12-30	2,500x75	19NM ESE
Hayward	10R-28L 10L-28R	5,024x150 3,107x75	20 NM ENE

Notes: NM - nautical miles, E- east, NE - northeast, ESE - east-southeast, ENE - east-northeast

Source: *Department of Commerce/National Oceanic and Atmospheric Administration (DOC/NOAA) Airport/Facility Directory*, February 1995

AIRSPACE STRUCTURE

Since the inception of aviation, nations have set up procedures within their territorial boundaries to regulate the use of airspace. Until recently, the system used to regulate airspace in the United States was different than those found in other countries; however, in September 1993, all airspace within the United States was reclassified to be consistent with international standards. Class A, B, C, D, E, and G are now used to describe the various airspace areas found in the United States. The basic premise of the use of airspace remains the same: airspace is still classified as either *controlled* or *uncontrolled*. The new airspace classifications are illustrated on **Exhibit 1D, Airspace Classifications**. The following sections describe those airspace classifications associated with Half Moon Bay Airport.

San Francisco Class B Airspace

The San Francisco Class B Airspace consists of controlled airspace, extending from the surface, or higher, to specific altitudes, within which all aircraft are subject to the operating rules and pilot/equipment requirements specified in *Federal Aviation Regulation (F.A.R.) Part 91*. This regulation requires specific IFR arrival and departure procedures as well as operative avionics equipment for all aircraft operating within the Class B Airspace. While operating within Class B Airspace,

pilots are provided radar separation and sequencing from the Bay Approach facility, and, if time permits, are also provided VFR traffic advisories.

The San Francisco Class B Airspace consists of numerous defined areas which are located at specific distances from a number of navigational facilities in the area. Specific *floor* and *ceiling* altitudes are associated with each airspace sector. Each of the airspace sectors provides controlled airspace for the associated airport, arrival route, departure route, or terrain clearance.

Half Moon Bay Airport is located under a sector of the San Francisco Class B Airspace (8,000 foot MSL ceiling and 5,000 foot MSL floor). The relationship of Half Moon Bay Airport to the San Francisco Class B Airspace is depicted on **Exhibit 1C.**

Class E Airspace

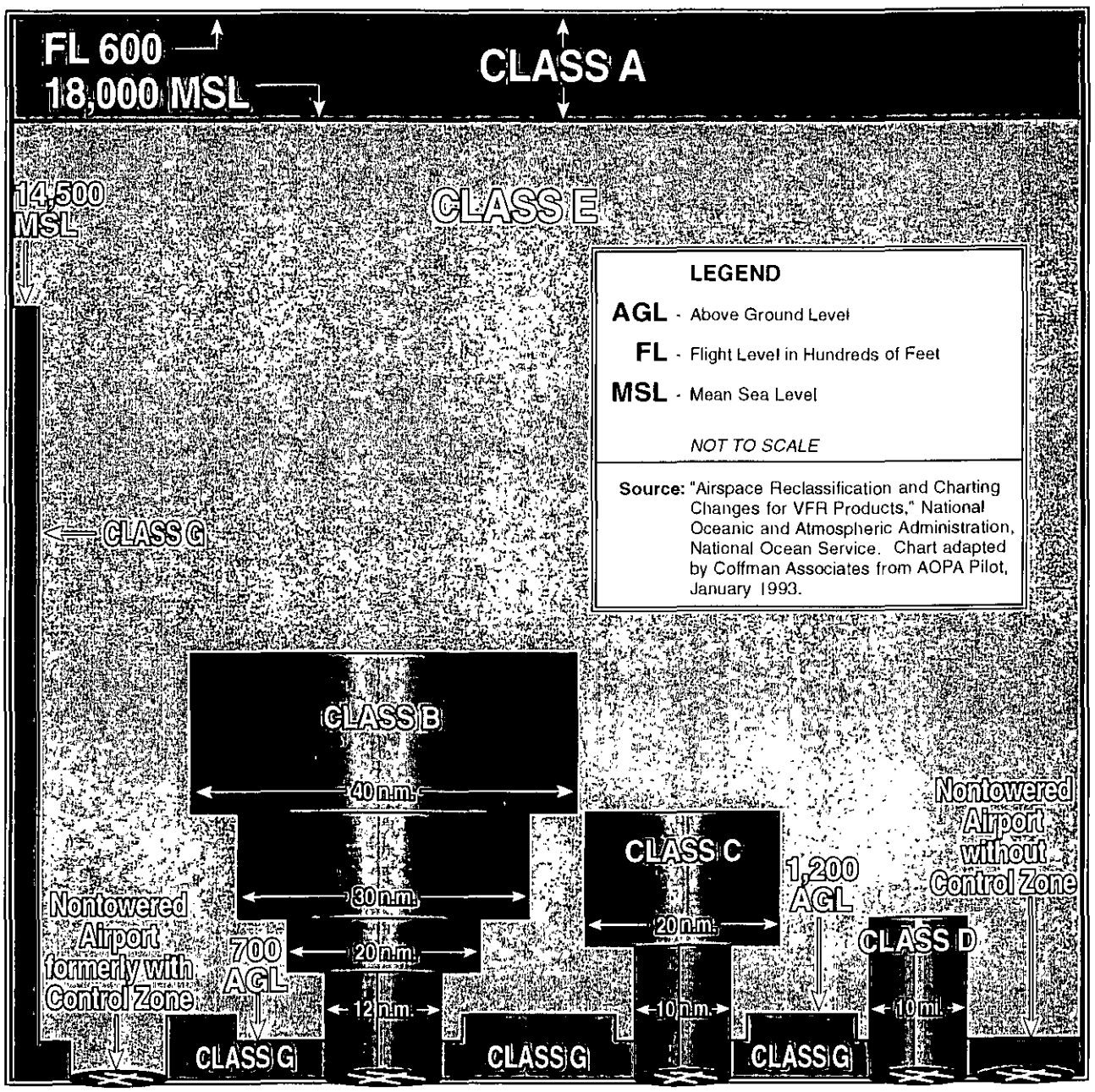
Class E Airspace is also associated with the Half Moon Bay Airport area. The Class E Airspace surrounds Half Moon Bay Airport, having a floor of 700 feet AGL extending upward to the Class B sector above. This Class E Airspace is designated for transition to and from the Class B Airspace. No specific pilots certification or aircraft equipment is required to operate within Class E airspace. The Class E Airspace associated with Half Moon Bay Airport is depicted on **Exhibit 1C.**

AIRWAYS

Aircraft operating on an IFR flight plan, whether in actual instrument meteorological conditions or not, are governed by the IFR instrument procedures. Most air carrier, business jet, and military operations are conducted under IFR procedures. Published procedures for instrument approaches outline the required flight paths and altitudes.

Aircraft operating under an Instrument Flight Plan normally travel between airports via electronic airways. These airways are marked on aeronautical charts, connecting enroute navigational aids that assist pilots in controlling their aircraft along these specified routes. There are two types of airway systems: the Low Altitude System (Victor Airways); and the High Altitude Airway System (Jet Routes). The Victor Airway System begins at 1,200 feet Above Ground Level (AGL) and extends upward to 18,000 feet MSL. The Jet Routes, layered above the Victor Airways, begin at 18,000 feet MSL and extend upward to 45,000 feet MSL.

Victor V27, a northwest-southeast airway, is located approximately six nautical miles southwest of the airport. This airway is used to navigate between the Point Reyes VORTAC (37 NM north-northwest of Half Moon Bay) and the Big Sur VORTAC (90 NM south-southeast of the airport).



NEW CLASSIFICATION	OLD CLASSIFICATION
CLASS A	Positive Control Area, Continental Control Area (part)
CLASS B	Terminal Control Area (TCA)
CLASS C	Airport Radar Service Area (ARSA)
CLASS D	Control Zone with Tower, Airport Traffic Area
CLASS E	Continental Control Area (part), Transition Areas, Control Zones without Tower
CLASS G	Uncontrolled Airspace

HALF MOON BAY AIRPORT

Exhibit 1D
AIRSPACE CLASSIFICATIONS

WILDERNESS AREAS

Half Moon Bay Airport is located adjacent to the James V. Fitzgerald Marine Reserve and the Monterey Bay National Marine Sanctuary and within 15 NM from the Gulf of the Farallones National Marine Sanctuary. The airport is also located within 26 NM of the Farallon National Wildlife Refuge at the Farallon Islands in the Pacific Ocean. Aircraft operating above marine sanctuaries and wildlife refuges are requested to maintain a minimum altitude of 2,000 feet AGL. Aircraft arriving, departing, or operating within the airport environment at Half Moon Bay Airport are exempt from this minimum altitude and will be below the 2,000 foot threshold. Federal regulations also prohibit airdrops by parachute or other means of persons, cargo, or objects from aircraft into wilderness areas.

NOISE ABATEMENT PROCEDURES

In an effort to reduce noise impacts on the neighbors to Half Moon Bay Airport, the County recommends a number of noise abatement procedures. Pilots are advised of these procedures through a Pilot's Guide, distributed by the airport. The following is a list of the noise abatement procedures in effect at Half Moon Bay Airport.

- Intersection takeoffs are prohibited.
- Turns prior to reaching 500 feet MSL are prohibited.
- Pilots are encouraged to reduce power/rpm as soon as safe and practical.
- Pattern work, especially touch-and-go's, is discouraged at night and on weekend and holiday mornings.
- Stop-and-go's are prohibited.
- Runway 30 has a right traffic pattern and Runway 12 has a left traffic pattern.
- Flights over St. Catherine's Hospital are discouraged.
- Pilots are encouraged to maintain pattern altitude (1,000 feet MSL) until it is necessary for them to descend for landing.
- Pilots are encouraged to avoid flying over homes whenever possible.
- Straight-in arrivals are prohibited.
- Arrivals from the west are encouraged to overfly the airport at or above 1,500 feet MSL, continuing until clear of the traffic pattern. These aircraft are then directed to make a normal 45 degree entry into the downwind leg at 1,000 feet MSL.
- Aircraft over 12,500 pounds are prohibited from landing at Half Moon Bay Airport without receiving prior approval from the airport manager.

SOCIOECONOMIC FACTORS

A variety of historical and forecast socioeconomic data, related to the Half Moon Bay Airport area was collected for use in various elements of the Master Plan. This information is essential in determining aviation service level requirements, as well as forecasting the number of based aircraft and aircraft activity at the airport. Aviation forecasts are normally directly related to the population base, economic strength of the region, and the ability of the region to

sustain a strong economic base over an extended period of time.

POPULATION

An analysis of population growth in the Half Moon Bay area was obtained from the California Department of Finance and the Association of Bay Area Governments (ABAG). **Table 1B, Historical and Projected Population Statistics,** provides a population breakdown for the cities of Half Moon Bay and Pacifica, San Mateo County, the State of California, and, where available, the unincorporated area around Half Moon Bay (referred to as the Unincorporated Mid Coast Area).

TABLE 1B
Historical and Projected Population Statistics

Year	City of Half Moon Bay	City of Pacifica	Unincorp. Mid Coast Area	San Mateo County	State of California
Historical Population					
1980	7,282	36,866	8,724	587,329	23,667,836
1985	7,500	36,700	N/A	614,400	26,113,000
1990	8,886	37,670	10,525	649,623	29,758,213
1991	9,550	37,900	N/A	658,000	30,325,000
1992	9,875	38,550	N/A	670,100	30,982,000
1993	10,100	38,900	N/A	677,800	31,522,000
1994	10,250	39,200	N/A	686,500	31,961,000
Average Annual Growth Rate	2.31%	0.41%	1.89%	1.05%	2.02%
Projected Population					
1995	10,400	39,500	11,400	689,600	33,188,930
2000	12,000	40,100	13,600	713,000	36,443,857
2005	14,700	40,600	16,000	734,100	39,424,114
2010	18,000	40,700	19,000	749,400	42,408,137
2015	21,600[1]	41,000[1]	21,000[1]	770,500[1]	45,574,195
Average Annual Growth Rate	3.72%	0.20%	3.46%	0.56%	1.60%

Notes: N/A - Not Available
[1] = Estimated by Coffman Associates

Sources: *Annual Planning Information -- San Mateo County, 1994*; State of California, Employment Development Department, Labor Market Information Division.
California Department of Finance, Demographic Research Unit; various materials; November 1993 and April 1994.
Projections 95 -- Forecasts for the San Francisco Bay Area to the Year 2010; Association of Bay Area Governments; December 1993.

EMPLOYMENT

Table 1C, Historical and Projected Employment, provides a breakdown of the general employment sources in the area by total employees. In 1990, the most significant employment sectors in both Pacifica and the City of Half Moon Bay are Retail and Service. Unincorporated Mid Coast Area, however, is primarily an agrarian economy, as indicated by the nearly 50 percent of total employees in this area which work in Agriculture/Mining sector jobs. In 1990, the largest employment sector in the County was Other, with 32.2 percent of total employment, followed by Service, with 31.7 percent. The Other employment category typically includes public administration, governmental services and public utilities.

TABLE 1C
Historical and Projected Employment

Employment Sector	Half Moon Bay	Unincorporated Mid Coast Area	Pacifica	San Mateo County
Agriculture/Mining	360	860	80	3,880
Manufacturing/ Wholesale	10	390	130	56,960
Retail	760	110	1,320	54,170
Service	1,050	270	1,570	101,290
Other	600	160	1,130	102,820
TOTAL	2,780	1,790	4,230	319,120
Projected Employment (2010)				
Agriculture/Mining	240	730	73	3,230
Manufacturing/ Wholesale	20	640	180	64,850
Retail	980	120	1,340	62,540
Service	1,460	410	2,230	140,850
Other	620	240	1,030	122,070
TOTAL	3,320	2,140	4,853	393,540

Source: *Projections 94: Forecast for the San Francisco Bay Area to the Year 2010*; Association of Bay Area Governments; December 1993.

In the City of Half Moon Bay, by the year 2010, the *Service* sector is expected to comprise nearly 44 percent of total employment within the City, up from 37.8 percent in 1990. The *Retail* sector is also expected to grow slightly. Employment in *Agriculture/Mining* and *Other* are both expected to notably drop, in terms of percentages, from nearly 13 percent and 21.6 percent, respectively, in 1990 to 7.2 percent and 18.7 percent in 2010. *Manufacturing/Wholesale* is expected to increase slightly, from 0.4 percent to 0.6 percent.

By 2010, *Service* sector employment in the City of Pacifica is expected to be even more significant, increasing from 37.1 percent in 1990 to nearly 46 percent of total employment in the City. The *Manufacturing/Wholesale* category is expected to increase slightly and all other categories are expected to decrease slightly (as a percentage of the total).

Unincorporated Mid Coast Area is expected to experience a decline in both the total number of employees and percentage share of the whole in the *Agriculture/Mining* employment sector (from 48 percent to 34.1 percent). The *Retail* category is also expected to decline slightly (from 6.2 percent 5.6 percent). The loss of these employees is expected to be made up in gains in the *Manufacturing/Wholesale*, *Service*, and *Other* employment categories.

With the exception of slight declines in four of the five employment categories, 2010 employment breakdowns in San Mateo County are expected to be similar to those in 1990. The *Service* sector is the only category expected to grow, increasing by approximately 4.1 percent of the total in 2010.

Half Moon Bay, Unincorporated Mid Coast Area and Pacifica, combined, are expected to account for only 2.03 percent of the County's total employment growth, between 1990 and 2010. The majority of this growth will be concentrated in the two cities.

INCOME

Per capita income, shown in **Table 1D, Per Capita Income**, for San Mateo County has grown steadily and significantly over the past ten years. In fact, over the period evaluated, per capita income in San Mateo County consistently ranked as one of the three highest in the State of California (the other two were San Francisco and Marin Counties, both immediately north of San Mateo and associated with San Francisco Bay region). In 1992, the per capita income in San Mateo County was 140 percent of the State average and 149 percent of the national average.

TABLE 1D
Per Capita Income

Year	San Mateo County	State of California	United States
1980	$14,682	$11,681	$9,940
1981	$16,666	$12,838	$11,009
1982	$17,772	$13,410	$11,583
1983	$18,820	$14,109	$12,223
1984	$20,768	$15,373	$13,332
1985	$21,896	$16,313	$14,155
1986	$23,141	$17,080	$14,906
1987	$24,042	$17,828	$15,638
1988	$25,506	$18,703	$16,610
1989	$27,287	$19,620	$17,690
1990	$28,806	$20,656	$18,667
1991	$29,056	$20,748	$19,163
1992	$29,918	$21,348	$20,105

Sources: California Department of Finance, Demographic Research Unit, March 1995.
U.S. Department of Commerce, Bureau of Economic Analysis, Regional Economic Information Systems, May 1994.

LAND USE PLANNING AND JURISDICTIONAL CONSIDERATIONS

An evaluation of existing land uses, zoning regulations and future planning in the vicinity of Half Moon Bay Airport aids in determining the compatibility of the airport with its neighbors. This information will be used to develop an airport master plan which is compatible with local, regional and state long-range planning goals, objectives and policies; and to evaluate the strengths and weaknesses of local regulatory control to ensure continuing compatibility of the surrounding area with the airport.

Half Moon Bay Airport is located within San Mateo County. Its nearest incorporated community is the City of Half Moon Bay, located four (4) miles south, along Cabrillo Highway. The City of

Pacifica is located north of the airport. Four (4) unincorporated communities are located around Half Moon Bay Airport: Moss Beach, Montara, El Granada, and Princeton-by-the-Sea. These unincorporated areas are represented by the Mid Coast Community Council, the local publicly elected representative body. **Exhibit 1E, Generalized Existing Land Uses**, illustrates the jurisdictional boundaries, communities, and generalized land uses in the vicinity of the Half Moon Bay Airport.

The exhibit illustrates a preponderance of residential uses north, west, and southeast of the airport. Princeton-by-the-Sea is a mixed-use area, comprised of commercial and industrial uses interspersed with residential properties. South of the airport is a military base used for monitoring satellites. Southeast of the airfield is Half Moon Bay and southwest of the airport, on the other side of a low ridge, is the Pacific Ocean. East of the airport are fields and the Montara Mountains.

Based on conversations with local planners, significant additional development in the vicinity of Half Moon Bay Airport is not expected given the potential access problems associated with Devil's Slide on the Cabrillo Highway, the limited availability of potable water and the limited capacity of the sewage treatment system in the area.

Half Moon Bay Airport is located within the jurisdiction of the California Coastal Commission. In the vicinity of the airport, the coastal zone extends from the mean high tide line to the closest major ridgeline parallel to the Pacific Ocean, in this case Montara Mountains. Prior to any development occurring within the coastal zone, the Coastal Commission must certify that the activities are consistent with state and county management programs and issue permit for the work. In general, permits are only issued for water-dependent activities when no feasible alternatives exist; wetland impacts should be avoided or minimized. San Mateo County is responsible for administering the Local Coastal Program in the vicinity of Half Moon Bay Airport.

SUMMARY

This chapter has examined those factors and issues that will have the greatest affects on the future development of Half Moon Bay Airport. The data collected provides the information necessary to perform subsequent analyses. It also provides the proper perspective from which to develop a realistic master plan that will meet the needs of the Coastside area of San Mateo County.

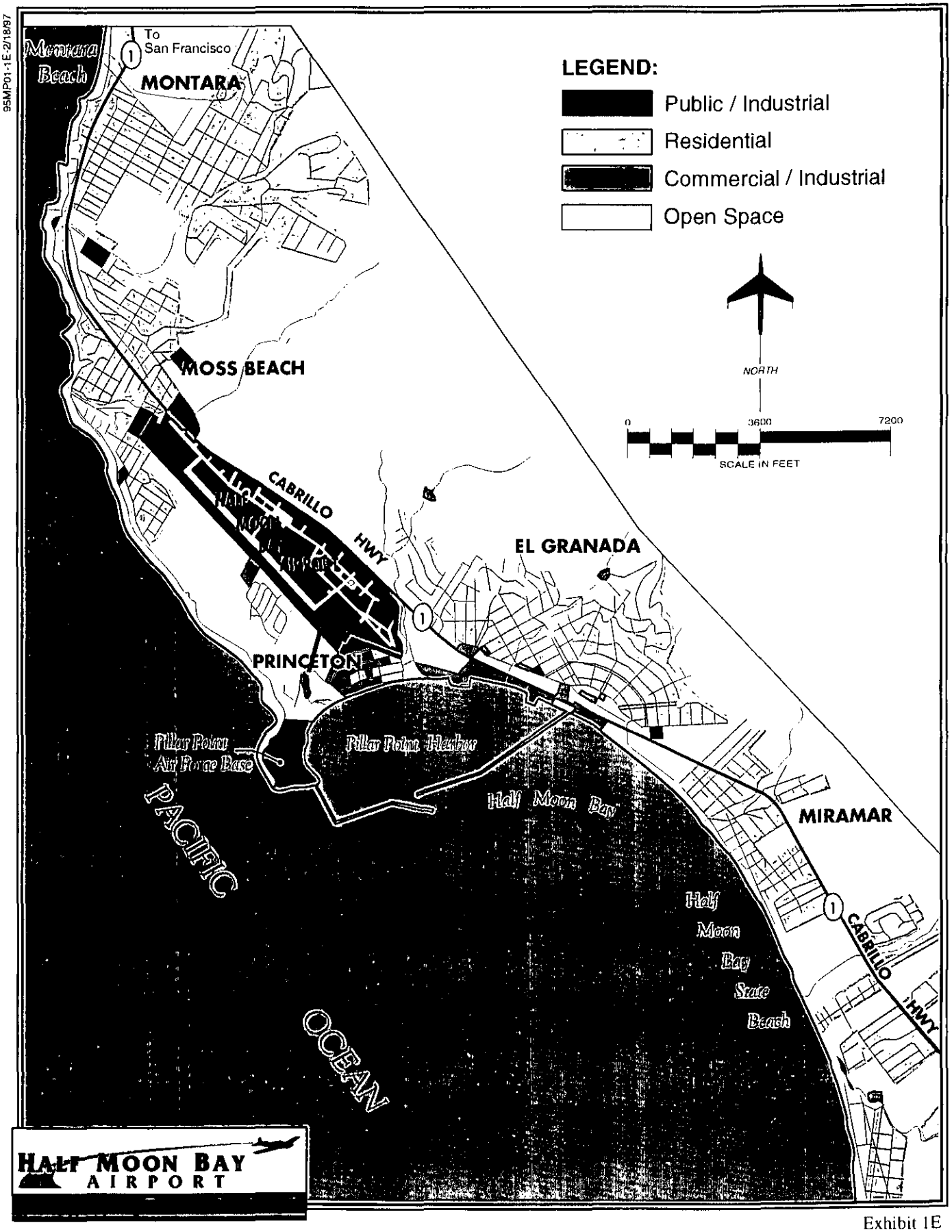
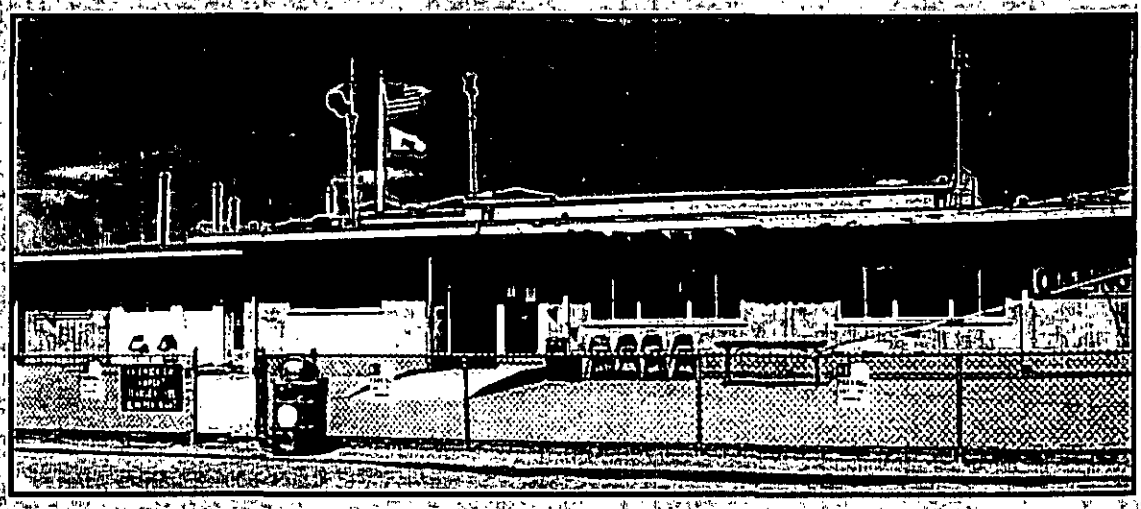


Exhibit 1E
GENERALIZED EXISTING LAND USES

SAN MATEO COUNTY
AIRPORTS
HALF MOON BAY

AVIATION DEMAND FORECASTS

AVIATION DEMAND FORECASTS



The proper planning of a facility of any type must begin with a definition of the needs that the facility can reasonably be expected to serve over the specified planning period. At Half Moon Bay Airport, this involves the development of a set of forecasts that best define the potential of future aviation demand. Forecasts of aviation activity at the airport can be used as a basis for determining the types and sizes of facilities required to meet the aviation needs of the airport's service area through the year 2015.

The primary objective of a forecasting 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 aviation activity on a year-to-year basis over an extended period of time. A growth curve, however, can be established to predict the overall 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; actual growth in activity seldom follows a simple straight line or mathematical curve; therefore, actual activity will likely flucuate above and below this line.

It is also important to recognize that forecasts serve only as guidelines, and planning must remain flexible to respond to unforeseen events. Aviation activity at an airport is influenced by many external factors, as well as by the facilities and services available. Since its inception, few industries have seen as dramatic a change as the aviation industry. Major technological ad-

vancements, regulatory and economic actions, and artificial infusions of pilots as a result of armed conflict, have resulted in erratic growth patterns placing significant impacts upon aviation activity.

The following sections attempt to define historical aviation trends and discuss other influences which may affect the future use of Half Moon Bay Airport. The results of these analyses are presented as the "best estimate" or selected forecasts for the facility.

FORECASTING METHODOLOGY

The systematic development of aviation forecasts involves both analytical and judgmental processes. A series of mathematical relationships are tested to establish statistical logic and rationale for projected growth. The judgement of the forecast analyst, based upon professional experience and knowledge of the situation, is important to the final determination of the selected forecast.

The most reliable approach to estimating aviation demand is through the utilization of more than one analytical technique. Methodologies frequently used include: trendline projection, correlation analysis, regression analysis, and market share analysis.

The analysis begins with the assessment of historical trends as data is collected and sorted on a variety of aviation indicators at the local, regional and national level. Data on aviation related factors such as aircraft operations and based and registered aircraft, were obtained for the analyses. Similarly, socioeconomic factors such as population, income and employment are also analyzed for their effect on aviation activity. The identification and comparison of the relationships between these various indicators provides the initial step in the development of realistic forecasts of aviation demand.

Trendline projection is probably the simplest and most familiar of the forecasting techniques. By fitting classical growth curves to historical demand data, then extending them into the future, a basic trendline 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. It is also important to remember that this methodology is time sensitive and only as accurate as the data points entered into the formula.

Correlation analysis provides a measure of direct relationship between two separate sets of historical data. An analysis is run which determines whether a change in one data base has historically reflected a corresponding change in the other data base. Should a reasonable correlation between the two data sets be determined, a regression analysis would then be employed to forecast future changes to one of the data bases. The relationship between two data bases is considered to be reliable when the resulting R^2 value is close to 1.0. The R^2 value can be considered the relationship

value: the higher the number, the stronger the correlation between the data bases, the lower the number, the weaker the relationship. Low R^2 values mean that the two data bases are not related and that changes in one data base are not reflected by changes in the other data base. Forecasters prefer to see R^2 values of greater than 0.95; however, lower numbers can be used provided that it is recognized that the reliability of the correlation is not as strong.

In correlation analysis, values for the aviation demand element such as based aircraft, operations, etc. (the dependent variable), are projected on the basis of one or more of the other indicators such as population, per capita income, etc. (the independent variables). Historical values for all variables are analyzed to determine the relationship between the independent and dependent variables. These relationships may be used where projected values of the independent variable(s) are available, to project corresponding values of the dependent variable.

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

In addition, another "cross-check" technique is to review and consider the forecasts made by other agencies. Although these agencies often utilize different data bases and variables, they generally use the same techniques for forecasting aviation activity. This review of other forecasting efforts, can assist in making subjective judgments concerning short-term forecast trends.

Using a broad spectrum of local, regional, and national socioeconomic information, surveys and aviation trends, forecasts were developed for several key aviation activity categories, including the following.

- General Aviation Based Aircraft
- Based Aircraft Fleet Mix
- General Aviation Aircraft Operations
- Annual Instrument Approaches
- Peaking Characteristics

The forecasting process also considers various other growth elements and several intangible factors before determining the selected forecast. These additional factors include the following.

- Uses for which the forecast is being developed
- Character of the community and service area
- Potential changes in the general business environment
- State-of-the-art advances in aviation related technology
- Impact of new facilities or improved services

- Policies of the airport owner and operator

For planning purposes, two important considerations impact the finalized forecasts. First, due to both economic and technological changes, one cannot assume a high level of confidence in forecasts that extend beyond five years; however, more than five years is often needed to complete a facilities development program, and at least twenty years is necessary to adequately amortize most capital improvements. The second consideration is the level of optimism reflected in the forecasts; aviation forecasting typically indicates some growth in the use of the facility, regardless of recent historical activity. This allows for comprehensive planning of the airport facility. To counter this unrestricted growth, the planning efforts to follow (i.e., Facility Requirements) must incorporate a degree of flexibility that will be responsive to deviations from the selected forecasts (i.e., timing of facility improvement and upgrades).

TRENDS AT THE NATIONAL LEVEL

Each year, the FAA publishes a national forecast of aviation activity. Included in these projections are categories for air carriers, air taxi/commuters and general aviation activity. The forecasts are prepared to meet budget and planning needs of the constituent units of the FAA, and to provide information that can be used by state and local authorities, the aviation industry and the general public.

The current edition of the *FAA Aviation Forecasts, Fiscal Years 1995-2006*, was used as a basis for the development of a series of forecasts for Half Moon Bay Airport. A synopsis of the FAA report of both existing and anticipated future conditions in the general aviation sector is presented in the paragraphs that follow.

General aviation activity in the United States has not followed the national economic growth trend in the past decade. In most cases, those elements that make up general aviation activity (aircraft, pilots, operations and flying hours) have all been relatively stagnant or have declined. Historically, the economic cycle of the general aviation industry closely paralleled that of the national economy. Theories abound as to why the decline in aircraft sales and new pilots has not responded to recent economic growth. Some cite high aircraft costs, which have continued to increase even during period of relatively modest inflation. Others cite high operating and increased product liability costs. In addition, the deregulation of the U.S. commercial airline industry has also affected general aviation by providing increased service and better connections by air carriers and regional commuters. This has likely reduced the desirability of using private general aviation aircraft when planning business or pleasure trips. It appears safe to say that the combination of these factors has outweighed the positive effects of a growing economy. On the positive side, use of general aviation aircraft by business has increased. As a result, the character of the general aviation fleet continues to change.

According to the aforementioned FAA forecasts, the more expensive and sophisticated turbine-powered component of the fixed-wing fleet is expected to grow while piston aircraft are projected to decline between 1994 and 2006. Single engine piston aircraft are projected to decline from 130,687 in 1994 to 122,400 in 2006 (down 6.3 percent), while the number of multi-engine piston aircraft is expected to decline from 16,406 aircraft to 16,000 in 2006 (down 2.4 percent).

Reflecting the increasing convenience of general aviation flying to businesses and their push for technology, turbine-powered aircraft are projected to increase from 4,359 in 1994 to 5,800 in 2006, an annual growth rate of 2.5 percent. The turbine-powered rotorcraft fleet is projected to increase at an annual rate of 1.8 percent over the 12-year period, from 2,864 in 1994 to 4,100 in 2006. **Exhibit 2A, U.S. Active General Aviation Aircraft Forecast**, graphically depicts forecast of U.S. active general aviation aircraft as well as the changing make-up of the active general aviation aircraft fleet forecast.

TRENDS IN THE BAY AREA

Regional aviation planning for the nine-county San Francisco Bay area is accomplished by the Metropolitan Transportation Commission (MTC). In 1994, the MTC completed the Regional Aviation System Plan (RASP) Update, which identified forecast based aircraft and operational levels for each general aviation and commercial service airport in the region, as well as passenger enplanements for each commercial service airport in the region.

According to the 1994 RASP Update, the distribution of based aircraft in the region is shifting toward the North Bay area and is expected to continue. One of the major deciding factors to aircraft owners in locating their aircraft in the Bay Area is the availability of hangar space. During the preparation of the RASP study, every airport in the region had tiedown space available, while no airport in the region had hangar space. In addition to hangar availability, monthly fees, other services, convenience, as well as runway length, navigational aids, etc., were also deciding factors, as to location of aircraft.

Another trend in the Bay Area, as well as other metropolitan areas in the United States, is the relocation of general aviation activity from commercial service airports to outlying general aviation airports. In the Bay Area, San Francisco International, Oakland International, and San Jose International Airports are faced with capacity reductions and potential delays due to the interaction of commercial and general aviation aircraft. According to the 1994 RASP, San Jose International Airport will experience significant capacity problems due to the presence of general aviation activity at the airport. The ability to utilize Reid-Hillview Airport to relieve San Jose International Airport is currently under consideration. Once again, the aircraft owner's decision factors may affect the number of aircraft/operations which would relocate to Reid-Hillview. Some aircraft owners

may determine that another airport in the region, although not as convenient, may have other facilities that would attract them to that airport. By diverting general aviation from Oakland International Airport, the airport could potentially increase runway capacity to accommodate an additional two million annual passengers.

Still, another issue in the Bay Area is the potential use of Moffett Field as a general aviation or joint-use airport. According to the 1994 RASP, Moffett Field would not provide greater instrument approach capabilities than San Jose due to the airspace conflicts associated with its proximity to San Jose International Airport. While Moffett Field has been taken over by NASA, the long-term use of the airport has not been defined. If Moffett Field were to become available for general aviation activity, relief would be provided to a number of Bay Area airports. Another option for Moffett Field is to relocate cargo activity from San Jose International Airport, thus providing some capacity relief.

According to the 1994 RASP, the trend in the Bay Area is for the number of general aviation based aircraft and general aviation operations to increase by as much as 25 percent and 37 percent respectively, by the year 2010. The number of passengers, operations, and air cargo volume at commercial service airports in the Bay Area is projected to increase by as much as 100 percent, 78 percent, and 230 percent, respectively.

OTHER AVIATION STUDIES

In order to develop aviation forecasts for Half Moon Bay Airport, other aviation related documents were reviewed. Each of the following studies provides an insight to the anticipated levels of various aviation related activities. Each of the studies are briefly summarized in the following sections.

1975 SAN MATEO COUNTY AIRPORTS PLAN

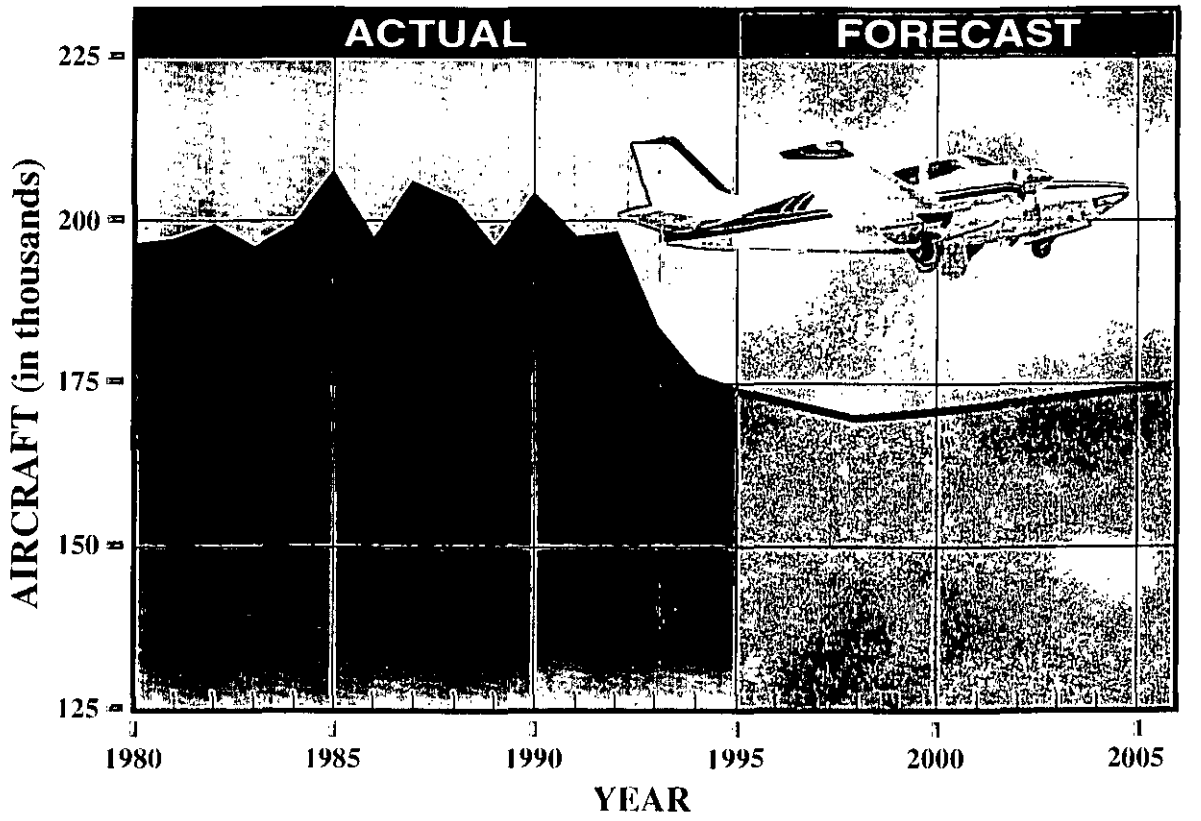
The last airport master plan completed for Half Moon Bay Airport was conducted in 1975 as part of the San Mateo County Airports Plan. As was stated earlier, the aviation industry has evolved through many significant changes since this document was prepared; therefore, the aviation activity identified in that document is of little value for forecasting purposes.

METROPOLITAN TRANSPORTATION COMMISSION REGIONAL AVIATION SYSTEM PLAN

Regional aviation planning for the nine-county San Francisco Bay area is accomplished by the Metropolitan Transportation Commission (MTC). In 1994, MTC completed the Regional Aviation System Plan (RASP) Update, which identifies the forecast based aircraft and operational levels anticipated at

95MP01-2A-2/18/97

ACTIVE GENERAL AVIATION AIRCRAFT



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

As of January 1	FIXED WING				ROTORCRAFT				
	PISTON		TURBINE						
		Multi-Engine	Turboprop	Turbojet	Piston	Turbine	Experimental	Other	Total
1994	[illegible]	16.4	4.4	3.9	1.6	2.9	10.9	5.2	176.0
1997	123.6	15.8	4.9	4.4	1.5	3.2	11.5	5.5	170.4
2000	122.4	15.6	5.2	4.7	1.5	3.5	12.0	5.8	170.7
2003	122.4	15.8	5.5	5.0	1.5	3.8	12.6	6.1	172.7
2006	122.4	16.0	5.8	5.3	1.5	4.1	13.1	6.4	174.6

Source: FAA Aviation Forecasts, Fiscal Years 1995-2006.

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.

HALF MOON BAY AIRPORT

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

Half Moon Bay Airport by the year 2010. By 2010, the projected number of based aircraft and operations at Half Moon Bay Airport are 126 and 47,527, respectively. This would indicate an average annual growth rate (1994 to 2010) of approximately three percent in based aircraft and one percent in operations. The increase in based aircraft over the planning period was generally attributed to the assumption that a general aviation airport in the area would be closed as well as the continued support of relocating general aviation activity from commercial service airports to general aviation airports, resulting in the relocation of those aircraft to other area airports (e.g., Half Moon Bay Airport, San Carlos Airport, Palo Alto Airport, etc.).

CALIFORNIA AVIATION SYSTEM PLAN

Statewide aviation planning for the State of California is provided by the California Department of Transportation, Division of Aeronautics (CalTrans). In 1987, CalTrans began updating the 1981 California Aviation System Plan (CASP), which was completed in 1989.

Element II: Forecast, Volume 1, dated July 1989, of the CASP identified the forecast based aircraft and operational levels anticipated at Half Moon Bay Airport for the year 2005. By the year 2005, the projected number of based aircraft and operations were 76 and 51,415, respectively. This would indicate an average annual decline of 0.6 percent in based aircraft and 0.8 percent decrease in operations from the 1987 based year values of 90 and 61,150, respectively.

SOCIOECONOMIC FORECASTS

Local and regional forecasts developed for socioeconomic variables generally can provide an indication of the potential for supporting growth in aviation activity. Three variables often found to be most valuable in evaluating potential general aviation activity, are population, employment and income. Employment and per capita income can be particularly useful because they reflect swings in the economy and are usually available on an annual basis.

Forecast of per capita income, employment and population were obtained from the California Department of Finance, the U.S. Department of Commerce and the Association of Bay Area Governments. Both the historical and forecast data for these three indicators are presented in **Table 2A, Socioeconomic Variables.**

TABLE 2A
Socioeconomic Variables

	San Mateo County			
Year	PCI[1,2]	Total Employment	Population	California PCI[1,2]
1984	19,723	341,716	605,200	13,896
1985	20,033	351,213	614,400	14,166
1986	20,942	356,161	618,600	14,782
1987	20,834	360,908	619,200	15,161
1988	21,167	377,699	625,400	15,584
1989	21,639	390,491	633,600	15,694
1990	21,529	400,561	649,623	15,850
1991	21,070	394,796	658,000	16,084
1992	21,084	382,212	670,100	16,422
1993	N/A	383,196	677,800	N/A
1994	N/A	N/A	686,500	N/A
FORECAST				
2000	22,998	367,180	713,000	17,926
2005	23,876	384,720	734,400	18,862
2010	24,754	393,540	749,400	19,781
2015	25,632	402,562	770,500	20,734

Notes: [1] Adjusted to 1983 Dollars
[2] PCI forecasts based on linear extrapolation of historic data
N/A - Not Available
Source: U.S. Commerce Department

In addition, the role of Half Moon Bay Airport and the geographic extent of the area the airport serves was identified. The *Service Area* of an airport is defined by its proximity to other airports providing similar service to the public, rather than by any jurisdictional boundaries. The Half Moon Bay Airport is located within San Mateo County; however, for the purposes of this study the airport service area was generally defined as the population centers of the Cities of Half Moon Bay and Pacifica and the Unincorporated Mid-Coast areas (see Exhibit 1A, Vicinity Map). The Half Moon Bay Airport Service Area is expected to experience a 2.5 percent average annual growth rate in population over the next 20 years. It is also anticipated that Half Moon Bay Airport will continue to serve the needs of the residents in this service area, with the potential of increased demand given adequate roadway access from the north. **Table 2B, Forecast Population Growth,** indicates the population forecast for the Half Moon Bay Airport Service Area.

TABLE 2B
Forecast Population Growth
Half Moon Bay Airport

	Existing	Forecast			
Region	1994	2000	2005	2010	2015
Half Moon Bay Airport Service Area	49,450[1]	65,700	71,300	77,700	83,600[2]

Notes: [1] Does not include Unincorporated Mid-Coast Area
[2] Estimated by Coffman Associates
Source: Projections 95 -- Forecast for the San Francisco Bay Area to the Year 2010; Association of Bay Area Governments; December 1993

GENERAL AVIATION ACTIVITY

General aviation is defined as that portion of activity which encompasses all facets of aviation except commercial airline and military operations and constitutes the majority of aircraft activity at Half Moon Bay Airport. 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 the following.

- Based Aircraft
- Aircraft Fleet Mix
- Annual Aircraft Operations

The total number of based aircraft at an airport is one of the most basic indicators of general aviation demand. By first developing a forecast of based aircraft, the growth of general aviation operational levels can be projected in consideration of the forecast based aircraft as well as other factors characteristic to Half Moon Bay Airport. The rationale behind the general aviation activity forecast is presented in the following section.

BASED AIRCRAFT

The number of aircraft based at an airport is, to some degree, dependent upon the nature and magnitude of aircraft ownership in the local service area. The process of developing forecasts of based aircraft at Half Moon Bay Airport, therefore, was begun with a review of historical aircraft registration in San Mateo County.

Registered Aircraft Forecasts

Historical records of aircraft ownership in San Mateo County were obtained from the *Census of U.S. Civil Aircraft*. **Table 2C, Aircraft Registration,** presents the San Mateo County aircraft

registrations since 1984 and compares them with active aircraft in the FAA Western-Pacific (AWP) Region. The FAA AWP consists of the states of California, Nevada, Arizona and Hawaii, and also includes the Trust Territory of the Pacific Islands, American Samoa, Guam, and the Commonwealth of Northern Marianas Islands. Registered aircraft in San Mateo County have been somewhat erratic over the last decade, however, the County's share of the FAA AWP Region's aircraft has increased over the last 10 years from 2.40 percent in 1985 to 2.84 percent in 1994.

A trendline, or time series forecast was analyzed, based on historical data from 1984 to 1994. Historical data within this time period provided a correlation coefficient of 0.10. This correlation coefficient, as previously discussed, in considered very poor.

TABLE 2C
Aircraft Registration
San Mateo County

Year	FAA AWP Region[1]	San Mateo County Aircraft Registrations	Percent of Market Share
1984	32,600	827	2.54
1985	35,000	839	2.40
1986	34,300	837	2.44
1987	36,100	811	2.25
1988	35,300	833	2.36
1989	34,200	839	2.45
1990	35,100	830	2.36
1991	34,700	821	2.37
1992	36,500	815	2.23
1993	31,400	800	2.55
1994	29,600	840	2.84
FORECAST			
2000	28,900	821	2.84
2005	29,200	829	2.84
2010	29,500	838	2.84
2015	29,900	849	2.84

Source: [1] FAA Census of U.S. Civil Aircraft

Table 2D, Registered Aircraft Regression Analyses, presents a number of regression analyses that were computed to examine the correlation between the historical San Mateo County registered aircraft and various socioeconomic variables. As shown in the table, the results of the various analyses resulted in very poor correlation coefficients (all less than R^2=0.13).

TABLE 2D
Registered Aircraft Regression Analysis
San Mateo County

	R^2 Value
Time-Series Correlation, 1984-1994	0.10
vs. San Mateo County PCI[1]	0.00
vs. San Mateo County Population	0.10
vs. San Mateo County Employment	0.03
vs. California Population	0.03
vs. California PCI[1]	0.13
vs. FAA AWP Region Active General Aviation Aircraft	0.01

Note: [1] Adjusted to 1983 Dollars

San Mateo County registered aircraft were examined as a percentage of the FAA AWP Region as previously presented in **Table 2C**. As indicated earlier, the San Mateo County market share has increased over the last decade. Given this increase, as well as other socioeconomic indicators in the area, maintaining a static market share, as indicated in **Table 2C**, does not appear to be appropriate. For this reason, an increasing market share was examined. An evaluation of the historical market share percentages indicated a 0.44 percent increase over the last ten years. Projecting this growth level over the 20-year planning period resulted in a market share of 3.72 percent by the year 2015. Both the static (low projection) and increasing (high projection) market share forecasts are presented in **Table 2E, Registered Aircraft Projections.**

The selected forecast for San Mateo County registered aircraft is based on a mid-range value of the low and high forecast values. This forecast would tend to be representative of the 1994 RASP study, which assumed the redistribution of based aircraft from a possible airport closure and the continued promotion of relocating general aviation activity from the commercial service airports to other reliever facilities.

TABLE 2E
Registered Aircraft Projections
San Mateo County

	2000	2005	2010	2015
MARKET SHARE ANALYSIS				
Static Share (Low)	821	829	838	849
Increasing Share (High)	884	958	1,033	1,112
Selected Forecast	**853**	**894**	**936**	**981**

Based Aircraft Forecast

Historical data related to based aircraft was collected from several sources including FAA records and records kept be the airport sponsor, as well as previously completed studies. The number of based aircraft recorded in these sources were very erratic during the last decade, primarily due to poor historical records. In 1994, County records indicated that there were 66 based aircraft at Half Moon Bay Airport.

A trendline analysis of the based aircraft at Half Moon Bay Airport for various time periods resulted in very poor correlation coefficients. This was expected due to the inconsistent historical records. Since the correlation coefficients were very poor, trendline analysis was determined to be of no significant value in determining the based aircraft forecast demand.

As was done in the analysis of the County's registered aircraft, several regression analyses were computed to examine the correlation between based aircraft and the previously presented socioeconomic variables. Since the number of based aircraft at Half Moon Bay Airport has been erratic over the last decade, the regression analyses resulted in poor correlation coefficients in each case. For this reason, these correlation analyses were determined to be of no value in this forecasting effort.

Another forecasting technique was the use of a ratio of based aircraft to population. In this technique, the ratio of based aircraft per 1,000 population is applied to population forecasts for the Half Moon Bay Airport Service Area. The number of based aircraft per 1,000 population for the Service Area in 1994 was approximately 1.1. Applying this ratio to population forecast for the Service Area through the year 2015, results in a forecast of 91 based aircraft by the year 2015.

The historical based aircraft data at Half Moon Bay Airport was also compared to the historical registered aircraft in San Mateo County. **Table 2G, Based Aircraft Market Share Analysis**, indicates that Half Moon Bay Airport, in 1994 had 7.86 percent of the County's registered aircraft over the last decade, however, the highest percentage occurred in 1984 at 11.12 percent. A market share analysis was then performed to identify potential demand at Half Moon Bay Airport. A constant market share of 7.86 percent was utilized as a baseline projection indicating the growth that could be anticipated if Half Moon Bay Airport's share of the market remained unchanged. An increasing market share projection was developed considering the historical growth rate of the County registered aircraft and the potential of Half Moon Bay Airport to attract a higher share of the market in the future. As a result, an increasing market share was projected to reach a high of 10.0 percent by the end of the planning period.

TABLE 2G
Based Aircraft Market Share Analysis
Half Moon Bay Airport

Year	San Mateo County	Half Moon Bay Airport	Percent of Registered		
1984	827	92	11.12		
1985	839	N/A	N/A		
1986	837	N/A	N/A		
1987	811	90	11.10		
1988	833	N/A	N/A		
1989	839	91	10.85		
1990	830	60	7.23		
1991	821	90	10.96		
1992	815	N/A	N/A		
1993	800	66	8.25		
1994	840	66	7.86		
Forecasts		**Constant Share**		**Increasing Share**	
2000	853	67	7.9%	72	8.4%
2005	894	71	7.9%	80	8.9%
2010	936	74	7.9%	88	9.4%
2015	981	78	7.9%	98	10.0%

Forecasts from other aviation related studies were also reviewed. The 1989 CASP indicated that Half Moon Bay Airport would have 76 based aircraft by the year 2005. The CASP projected a 0.6 percent decrease in based aircraft at Half Moon Bay Airport, due generally to the remoteness of the airport. The forecast number of based aircraft in the NPIAS for the year 2000 was indicated as 92. The NPIAS had indicated a small growth over that document's planning period. The 1994 RASP forecast 71 based aircraft at Half Moon Bay Airport in the year 2010. Based on the existing (1994) number of based aircraft (66), the projected number of 71 based aircraft in the year 2010 was considered slightly low.

The selected based aircraft forecast indicated in **Table 2H, Forecast Based Aircraft,** illustrates an average annual growth rate of approximately 1.6 percent during the planning period. This growth is anticipated based on the ability to provide additional facilities at the airport, as well as due to an anticipated general resurgence of the general aviation industry. **Exhibit 2B, Based Aircraft Forecast,** illustrates the selected based aircraft forecast.

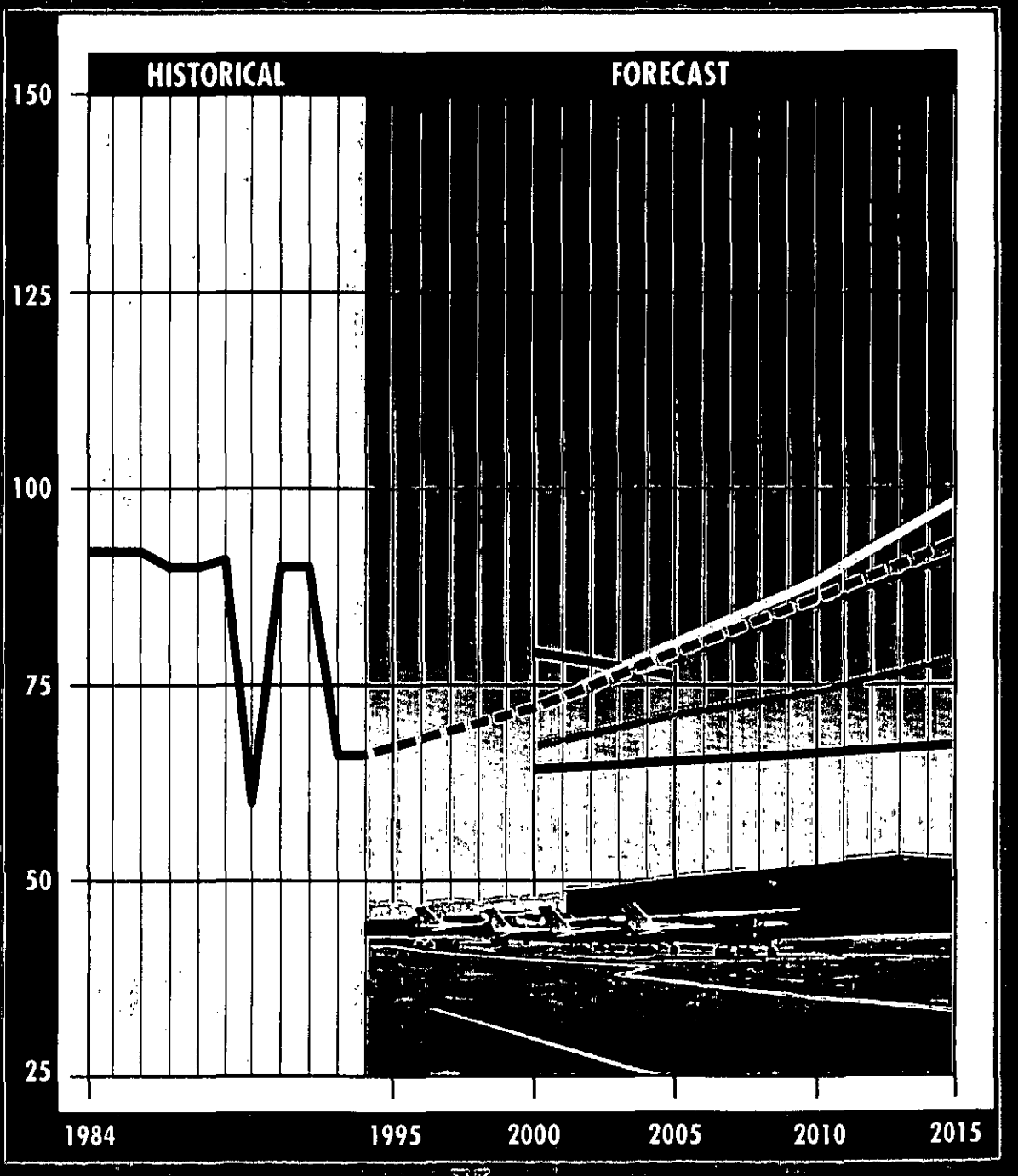
TABLE 2H Forecast Based Aircraft Half Moon Bay Airport	2000	2005	2010	2015
Based Aircraft Per 1,000 Population				
Half Moon Bay Airport Service Area	72	78	85	91
Market Share				
County (Static)	67	71	74	78
County (Increasing)	72	80	88	98
FAA Western Pacific Region	64	65	66	67
Other Studies				
1989 CASP	79	76	N/A	N/A
1990-1999 NPIAS	92	N/A	N/A	N/A
1994 RASP	N/A	N/A	71	N/A
Recommended Forecast				
Based Aircraft Forecast	**72**	**79**	**86**	**93**
Note: N/A - Not Available				

AIRCRAFT FLEET MIX

Knowing the aircraft fleet mix expected to utilize the airport is necessary to properly plan the facilities that will best serve not only the level of activity but also the type of activities occurring at the airport. The mix of based aircraft at Half Moon Bay Airport was determined through an analysis of the types of aircraft currently based at the Airport. This was compared with the FAA existing and forecast general aviation fleet mix. The fleet mix trend at Half Moon Bay Airport is anticipated to consist of a majority of single engine aircraft. The single-engine aircraft percentage is expected to decrease from approximately 97 percent of the total based aircraft to approximately 86 percent by the end of the planning period. This decrease in the percentage of single engine aircraft is due to an anticipated increase in business aircraft activity or more sophisticated aircraft. The multi-engine, turboprop, and turbojet percentages are expected to increase from three percent, zero percent, zero percent, respectively, to 8.6 percent, 2.2 percent, and 1.1 percent, respectively. The numbers of rotorcraft mix is also expected to increase from zero percent to 2.2 percent. The existing and forecast fleet mix are shown in **Table 2J, Based Aircraft Fleet Mix Projections.**

95MP01-2B-2/18/97

Based Aircraft



HALF MOON BAY AIRPORT

Exhibit 2B
BASED AIRCRAFT FORECAST

TABLE 2J
Based Aircraft Fleet Mix Projections
Half Moon Bay Airport

	Existing	Forecast			
Aircraft	1994	2000	2005	2010	2015
Single Engine	64	67	72	77	80
Twin Engine	2	4	5	6	8
Turboprop	0	1	1	2	2
Turbojet	0	0	0	0	1
Rotorcraft	0	0	1	1	2
Total	**66**	**72**	**79**	**86**	**93**

ANNUAL AIRCRAFT OPERATIONS

An aircraft operation is defined as any takeoff or landing performed by an aircraft. There are two types of operations, local and itinerant. A local operation is a takeoff or landing performed by an aircraft that will operate within the local traffic pattern, in sight of the airport, or will execute simulated approaches or touch-and-go operations. Itinerant operations are all arrivals and departures other than local. Generally, local operations are comprised of training operations and itinerant operations are those aircraft with a specific destination away from or to the airport. Typically, itinerant operations increase with business and industry use of the airport since business aircraft are used primarily to move people from one location to another.

Since Half Moon Bay Airport does not have an airport traffic control tower, actual operations data was not available for this evaluation. Historical records were reviewed and were determine to be of little value, due to inconsistencies.

An historical trendline analysis for the period 1984-94 produced a very poor correlation coefficient, due to the poor historical records; therefore, a projection of operations using the trendline analysis method was determined to be of no significant value. Likewise, linear regression analyses were also determined to be of no significant value, due again to poor correlation coefficients.

Another commonly used forecasting method for projecting general aviation operations is the use of a ratio of operations to based aircraft. Based on the CalTrans statistic sampling conducted in 1993, the operation per based aircraft was determined to be 580. The general aviation operations forecast for the 20-year period assume the ratio of operations to based aircraft would remain

constant over the planning period. The results are presented in **Table 2K, Annual Operations Forecast** as well as on **Exhibit 2C, Annual Operations Forecast.**

Also included in **Table 2K** and **Exhibit 2C** are forecasts of operational levels produced in the previously discussed aviation related studies.

The selected forecast of annual operations is predicated on the operations per based aircraft methodology. This forecast represents a 1.1 percent average annual growth rate over the planning period.

TABLE 2K
Annual Operations Forecast
Half Moon Bay Airport

	2000	2005	2010	2015
Operations per Based Aircraft				
Operations per Based Aircraft (580)	41,760	45,820	49,880	53,940
Other Resources				
1989 CASP	53,761	51,415	N/A	N/A
1994 RASP	N/A	N/A	47,527	N/A
NPIAS 1990-1999	71,000	N/A	N/A	N/A
Selected Forecast				
Annual Operations	**42,000**	**46,000**	**50,000**	**54,000**

Note: N/A - Not Available

LOCAL VERSUS ITINERANT OPERATIONAL SPLIT

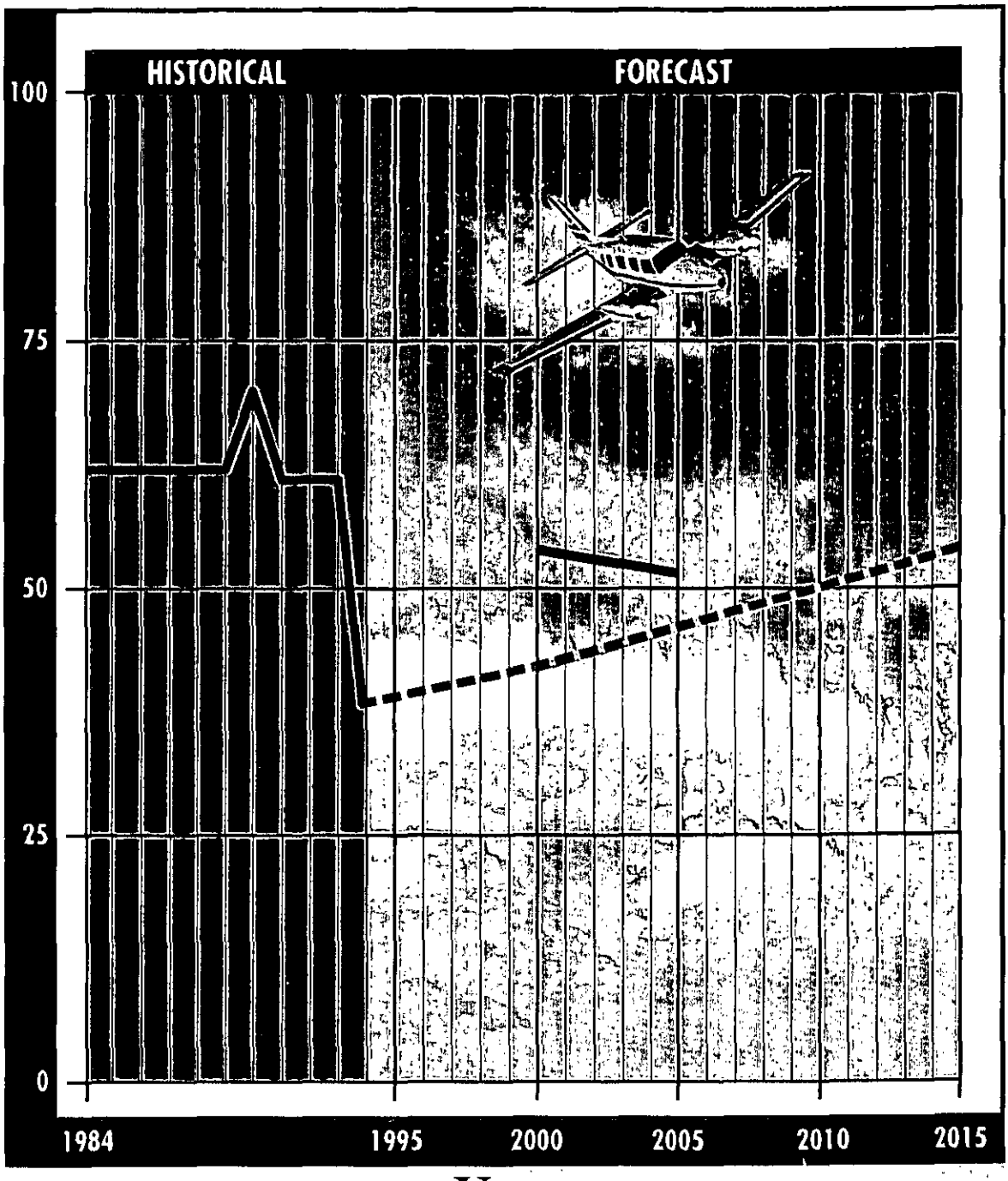
As previously stated, there are two types of operations: Local and itinerant. The split between these two types of operations can provide important insight into the types of facilities needed at the airport (e.g., tiedowns, hangars, navigational aids, etc.).

According to users of the airport, the annual operational split at Half Moon Bay Airport was estimated at approximately 40 percent itinerant and 60 percent local. It is anticipated that this operational percentage will remain constant throughout the planning period.

The distribution of local versus itinerant operations for the 20-year planning period is provided in **Table 2L, Local Versus Itinerant Operations.**

95MP01-2C-2/18/97

Annual Operations (in thousands)



HALF MOON BAY AIRPORT

Exhibit 2C
ANNUAL OPERATIONS FORECAST

TABLE 2L
Local Versus Itinerant Operations
Half Moon Bay Airport

	Existing	Forecast			
Annual Operations	**1994**	**2000**	**2005**	**2010**	**2015**
Itinerant	15308	16800	18,400	20,000	21,600
Local	22963	25200	27,600	30,000	32,400
Total Annual Operations	**38271**	**42000**	**46,000**	**50,000**	**54,000**

ANNUAL INSTRUMENT APPROACHES

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

Instrument weather conditions in the Half Moon Bay Airport area occur approximately 25 percent of the time. The number of AIA's were calculated for the planning period by utilizing 50 percent of the itinerant operations divided by two (to concentration on arrivals), times the percentage of actual IFR conditions. Given the potential for instrument approach capabilities at Half Moon Bay Airport and the increasing number of sophistication of general aviation aircraft, the number of AIA's are expected to increase gradually throughout the planning period. The forecast of AIA's at the Half Moon Bay Airport are described in **Table 2M, Annual Instrument Approach Forecast.**

TABLE 2M
Annual Instrument Approach Forecast
Half Moon Bay Airport

	Existing	Forecast			
	1994	**2000**	**2005**	**2010**	**2015**
Annual Itinerant Operations	15308	16800	18,400	20,000	21,600
Annual Instrument Approaches[1]	957	1,050	1,150	1,250	1,350

Note: [1] Based on the percentage of local IFR weather conditions. Existing AIA's would be expected to be conducted if instrument approach capabilities were provided.

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 Master Plan are:

- **Peak Month** - The calendar month when peak aircraft operations occur.
- **Design Day** - The average day in the Peak Month. Normally, this indicator is easily derived by dividing the Peak Month operations by the number of days in the month.
- **Busy Day** - The busy day of a typical week in the Peak Month. This descriptor is used primarily to determine general aviation ramp space needs.
- **Design Hour** - The peak hour within the design day. Design hour is used particularly in airfield demand/capacity analysis as well as for terminal building and access requirements.

It is important to note that only the peak month is an absolute peak within a given year. All the others will be exceeded at various times during the year; however, they do represent reasonable planning standards that can be applied without over-building or being too restrictive.

The peaking characteristics at Half Moon Bay Airport were estimated based on the general activity in the area. Peak month operations were considered to be approximately 10 percent of annual operations. For planning purposes, the peak month has been projected to remain at 10.0 percent of annual operations throughout the planning period.

The Design Day will vary depending on the number of operations during the peak month. At Half Moon Bay Airport, the average day was determined by dividing the Peak Month operations by 31 (the number of days in an average month).

Design Hour operations at general aviation airports typically range between 10 and 15 percent of the average day depending on the total activity. The Design Hour activity has been projected to remain at a constant 12.5 percent throughout the planning period.

The definition of general aviation passengers (Design Hour Pilot/Passengers), as used in this section, refers to the average number of pilots and passengers expected to utilize an airport's general aviation terminal facilities during a given time. Touch-and-go operations would be an exception to the higher passenger levels anticipated. Pilots conducting touch-and-go operations may only use the terminal facilities at the start and finish of their training activity. At Half Moon Bay Airport, it is estimated that approximately 60 percent of the general aviation operations are training in nature. This percentage is anticipated to remain constant throughout the planning period. In order to ensure that space requirements are not overestimated in the planning effort, these operations

were not considered in determining design hour pilot/passengers. In calculating the design hour pilot/passengers, an average of 2.0 passengers per design hour operation, excluding training operations, was assumed for the existing condition. It is anticipated that this factor would remain constant throughout the planning period. The peaking characteristics for the 20-year planning period at Half Moon Bay Airport are presented in **Table 2N, Forecast Peaking Characteristics.**

TABLE 2N
Forecast Peaking Characteristics
Half Moon Bay Airport

	Existing	Forecast			
	1994	2000	2005	2010	2015
Total Operations					
Annual	38,271	42,000	46,000	50,000	54,000
Peak Month	3,827	4,200	4,600	5,000	5,400
Design Day	123	135	148	161	174
Design Hour	15	17	19	20	22
General Aviation Pilot/Passengers					
Design Hour Pilot/ Passengers	12	14	15	16	18

SUMMARY

This chapter has provided aviation demand forecasts for those indicators that are essential to effective analysis of future facility needs of the Half Moon Bay Airport. The next step in the master planning process is to assess the capacity of the existing facilities and to determine what facilities will be necessary to potentially meet future aviation demands. **Table 2P, Forecast Summary,** is provided as a summary of forecast information for referral in later portions of the study.

TABLE 2P
Forecast Summary
Half Moon Bay Airport

	Existing	Forecast			
	1994	2000	2005	2010	2015
Based Aircraft					
Single Engine	64	67	72	77	80
Multi Engine	2	4	5	6	8
Turboprop	0	1	1	2	2
Turbojet	0	0	0	0	1
Rotorcraft	0	0	1	1	2
Total Based Aircraft	**66**	**72**	**79**	**86**	**93**
Annual Operations					
Itinerant Operations	15,308	16,800	18,400	20,000	21,600
Local Operations	22,963	25,200	27,600	30,000	32,400
Total Annual Operations	**38,271**	**42,000**	**46,000**	**50,000**	**54,000**
Annual Instrument Approaches	957	1,050	1,150	1,250	1,350

SAN MATEO COUNTY
AIRPORTS
HALF MOON BAY

FACILITY REQUIREMENTS

FACILITY REQUIREMENTS

To plan for the future of Half Moon Bay Airport, it is necessary to translate forecast aviation demand into the specific types and quantities of facilities that will adequately serve these needs. This chapter uses established planning criteria to determine the airside (e.g., airfield capacity, runways, taxiways, navigational aids, marking and lighting) and landside (e.g., hangars, terminal building, aircraft parking apron, fueling, automobile parking and access) facility requirements.

Two fundamental planning procedures are utilized in the facility requirements analysis: the demand capacity analysis, and the determination of airport development needs. The objective of this effort is to identify deficiencies in existing facilities and outline which new facilities will be needed to accommodate forecast demands. Having established the facility requirements, the next chapter will address alternatives for providing necessary facilities, and evaluate the most cost-effective and efficient means for implementation.

AIRFIELD CAPACITY

METHODOLOGY

A variety of techniques have been developed for the analysis of airfield capacity. The current methodology, accepted by the Federal Aviation Administration (FAA) and employed in this study, is based on *FAA Advisory Circular 150/5060-5, Airport Capacity and Delay.* With this methodology, airfield runway capacity is described by the following three terms.

- **Hourly Capacity of Runways:** The maximum number of aircraft operations that can take place on the runway system in one hour.

- **Annual Service Volume:** The annual capacity or a maximum level of annual aircraft operations that may be used as reference in planning the runway system.

- **Annual Aircraft Delay:** The total delay incurred by all aircraft on the airfield in one year.

As indicated on **Exhibit 3A, Demand/ Capacity Methodology Factors**, the capacity of an airport is determined by several factors. Among these are airfield layout, meteorology, runway use, aircraft mix, percent arrivals, percent touch-and-go's and exit taxiway locations. Each of these elements and its impact on airfield capacity is discussed in the following paragraphs.

Airfield Layout

The airport layout refers to the location and orientation of runways, taxiways and the terminal area. As previously illustrated on **Exhibit 1B**, the layout of Half Moon Bay Airport consists of a single runway oriented northwest to southeast. Runway 12-30 has a semi-parallel taxiway on one side of the runway and no taxiways that qualify as *exit* taxiways. The semi-parallel taxiway connects the runway to the terminal area via three connecting taxiways. Landside facilities include the terminal building, fixed based operators, T-hangars, port-a-port hangars, and tiedowns.

Meteorology

Weather conditions can affect runway utilization due to changes in cloud ceilings and visibility. When weather conditions deteriorate below Visual Flight Rule (VFR) conditions, the instrument capacity of the airport becomes a factor in determining airport capacity.

During Instrument Flight Rule (IFR) conditions, separations between landing and departing aircraft increase in length and the capabilities of the airfield system to accept operations is reduced.

AC 150/5060-5 recognizes three categories of ceiling and visibility minimums. VFR conditions occur whenever the cloud ceiling is at least 1,000 feet above ground level and the visibility is at least three statute miles. IFR conditions occur whenever the reported cloud ceiling is at least 500 feet but less than 1,000 feet and/or visibility is at least one statute mile but less than three statute miles. Poor Visibility and Ceiling (PVC) conditions exist whenever the cloud ceiling is less than 500 feet and/or visibility is less than one statute mile.

At Half Moon Bay Airport, VFR conditions are estimated to occur approximately 75 percent of the time with IFR conditions accounting for the remaining 25 percent. The available data on the annual percentage of VFR and IFR conditions for the region, was obtained through historical data from the National Weather Service, as well as estimates from local airport users. For the purposes of this study, PVC conditions are included in the IFR percentage.

95MP01-3A-2/18/97

AIRFIELD CAPACITY

1 INPUT

Airport Layout · Meteorology · Aircraft Mix · Percent Arrivals · Touch & Go's · Exit Taxiways

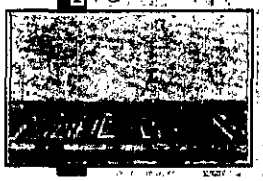
2 PROCESS

Wind & Weather

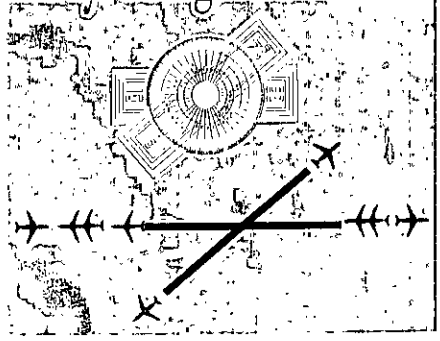
VFR

IFR

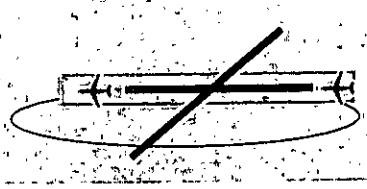
PVC



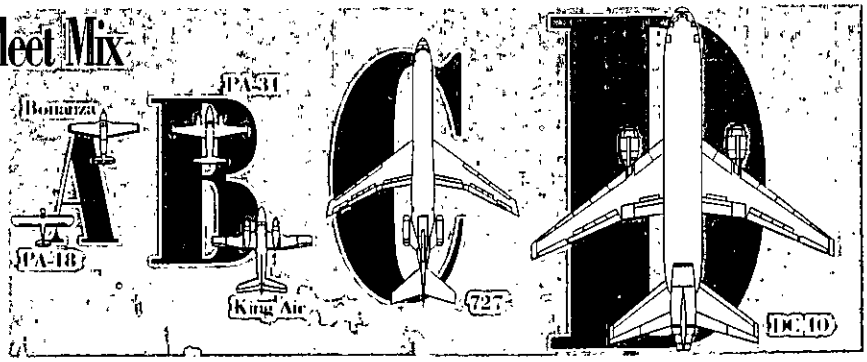
Runway Configuration



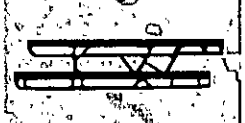
Touch & Go Factor



Fleet Mix



Exit Factor



Operations: Percent Arrivals

3 OUTPUT

Runway Hourly Capacity
Annual Aircraft Delay

ANNUAL SERVICE VOLUME

HALF MOON BAY AIRPORT

Exhibit 3A
DEMAND/CAPACITY
METHODOLOGY FACTORS

Aircraft Mix

The airside capacity methodology identifies four classes into which aircraft are categorized. Classes A and B include small propeller aircraft and jets, weighing 12,500 pounds or less. Class C generally consists of large business turboprop and jet aircraft, while Class D consists of larger jet and propeller aircraft generally associated with airline and military use. The aircraft operational mix used in calculating the capacity of Half Moon Bay Airport, based upon the forecasts of aviation demand, is presented in **Table 3A, Aircraft Operational Mix Forecast.**

TABLE 3A
Aircraft Operational Mix Forecast
Half Moon Bay Airport

	Aircraft Classification			
Year	A	B	C	D
1995	90%	10%	0%	0%
2000	87%	13%	0%	0%
2005	85%	15%	0%	0%
2010	83%	17%	0%	0%
2015	81%	19%	0%	0%

Definitions	
Class A:	Small single-engine, gross weight 12,500 pounds or less
Examples:	Cessna 172/182, Mooney 201, Beech Bonanza, Piper Cherokee/ Warrior
Class B:	Small, twin-engine, gross weight 12,500 pounds or less
Examples:	Beech 1300, Cessna 402, Lear 25, Mitsubishi MU-2, Piper Navajo, Rockwell Shrike, Beech 99, Cessna Citation I, Beech King Air 100
Class C:	Large aircraft, gross weight 12,500 pounds to 300,000 pounds
Examples:	Douglas DC-9, Beech King Air 200, Boeing 727/737/757/767, Gulfstream III, Citation II, DeHavilland DH-8, Lear 35/55, Swearingen Metro, Beech 1900
Class D:	Large aircraft, gross weight more than 300,000 pounds
Examples:	Lockheed L-1011, Douglas DC-8-60/70, Boeing 747, Airbus A-300/A-310

Percent Arrivals

The percentage of arriving aircraft also influences the capacity of runways. In most cases the higher the percentage of arrivals during the peak period, the lower the service volume. At Half Moon Bay Airport, there was no information that indicated a disproportionate share of arrivals to departures during peak

periods; therefore, it was assumed that arrivals equaled departures during peak periods.

Touch-And-Go Operations

A touch-and-go operation refers to an aircraft which lands then makes an immediate takeoff without coming to a full stop or exiting the runway. These operations are normally associated with training and are classified as local operations. Touch-and-go's currently are estimated to comprise approximately 40 percent of all operations at Half Moon Bay Airport. This percentage is expected to remain constant throughout the planning period.

Exit Taxiways

In addition to the runway configuration, the most notable characteristic considered in the airside capacity model is the number and types of taxiways available to exit the runway. The location of *exit* taxiways affects the occupancy time of an aircraft on the runway. The longer a plane remains on the runway, the lower the capacity of that runway. The aircraft mix index determines the distance the taxiway must be located from the runway end to qualify as an exit taxiway. At the current mix index, only those exits located between 2,000 feet and 4,000 feet of the runways ends qualify as exit taxiways in the capacity analysis. Using the mix index criteria, there are no connector taxiways which qualified as exit taxiway at Half Moon Bay Airport. It is assumed that the number of exit taxiways will not change during the planning period.

CAPACITY ANALYSIS

The preceding information was used in conjunction with the FAA airside capacity model to determine the operational capacity at Half Moon Bay Airport. As mentioned earlier, operational capacity is expressed in the following three terms.

- Weighted Hourly Capacity
- Annual Service Volume
- Annual Aircraft Delay

From these three findings, it is possible to determine the adequacy of the current airfield to accommodate potential demand scenarios and to determine the range of aircraft delay associated with each demand level.

WEIGHTED HOURLY RUNWAY CAPACITY

The first step in capacity analysis involves the computation of an hourly runway capacity during VFR and IFR conditions. Because IFR conditions increase separation requirements between aircraft, VFR hourly capacity is normally much higher. From these calculations, a weighted hourly capacity can be calculated.

The airfield capacity is also influenced by the runway configuration. Parallel runway systems provide greater airport capacity than a single runway or two intersecting runways. The weighted

hourly capacity for the existing runway system is 72 operations. This hourly capacity is expected to remain the same if no airfield capacity improvements were completed during this 20-year planning period.

ANNUAL SERVICE VOLUME

Once the hourly capacity is known, the annual service volume (ASV) can be determined. The ASV was calculated using the following equation.

ASV = C x D x H

C = weighted hourly capacity

D = ratio of annual demand to average daily demand during the peak month

H = ratio of average daily demand to average peak hour demand during the peak month

The weighted hourly capacity • for Half Moon Bay Airport is 72 operations and would remain constant with no enhancements to airfield capacity. The daily demand ratio (D) was determined by dividing the annual operations by average daily operations during the peak month. The hourly ratio (H) was determined as the inverse of the percent of daily operations occurring during the peak hour. The data used for these ratios was based on the peaking characteristics developed in Chapter Two.

The ASV for Half Moon Bay Airport's existing configuration is 185,600 operations. The ASV indicates that the airport is currently operating at approximately 21 percent of annual capacity and would be expected to increase to 29 percent of capacity by the year 2015.

ANNUAL DELAY

Even before an airport reaches capacity, aircraft operations begin to experience certain amounts of delay. Delays occur to arriving traffic that must wait in the VFR traffic pattern or in the IFR holding pattern, waiting their turn to land. Departing traffic must hold on the taxiway or the holding apron while waiting for the runway and final approach to be clear.

As an airport's level of operations increases, delay increases exponentially. In 1994, with 38,271 annual operations at Half Moon Bay Airport, aircraft experienced an average delay of approximately 0.13 minutes per aircraft operation. Actual delays to individual aircraft can be as high as ten times this average value. At present operational levels, total annual delay to aircraft at Half Moon Bay Airport is approximately 83 hours. When the airport reaches 54,000 operations, as forecast for the year 2015, delays will average approximately 0.26 minutes per aircraft operation and will total approximately 234 hours annually.

In general, the FAA recommends consideration of development improvements to increase capacity when annual aircraft operations reach 60 percent of ASV or delays become excessive (greater than three minutes per aircraft operation). By the year 2015, operations at Half Moon Bay Airport will reach 29 percent of the ASV, in addition, delays per operation will not be significant.

CAPACITY AND DELAY SUMMARY

Table 3B, Airfield Demand/Capacity and Delay Summary, provides a summary of the operational capacity and delay analysis for Half Moon Bay Airport. The Airport's operational capacity is not expected to become a constraining factor to the future growth of the airport.

TABLE 3B
Airfield Demand/Capacity and Delay Summary
Half Moon Bay Airport

Year	Annual Operations	Weighted Hourly Capacity	Annual Service Volume	Average Delay Per Operation (Minutes)	Total Annual Delay (Hours)
1994	38,271	72	185,600	0.13	83
2000	42,000	72	185,600	0.16	112
2005	46,000	72	185,600	0.19	146
2010	50,000	72	185,600	0.22	183
2015	54,000	72	185,600	0.26	234

AIRSIDE FACILITY REQUIREMENTS

Airside facilities are those that are related to the arrival and departure of aircraft. These facilities are comprised of the following items.

- Runways
- Taxiways
- Navigational Aids
- Marking and Lighting

The selection of the appropriate FAA design standard for the development of airfield facilities is based primarily upon the characteristics of the aircraft which are expected to use the airport. The most critical aircraft characteristics are approach speed and wingspan of the aircraft anticipated to use the airport both today and in the future. The planning for future aircraft use is particularly important because design standards are used to determine separation distances between facilities that could be extremely costly to relocate at a later date.

According to *FAA Advisory Circular 150/5300-13*, aircraft are grouped into

five categories based upon their certificated approach speeds.

Category A: Speeds less than 91 knots.

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

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

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

Category E: Speeds 166 knots or more.

Categories A and B include small, propeller aircraft and certain smaller business jets. Categories C, D, and E consist of the remaining business jets as well as the larger jet and propeller aircraft generally associated with commercial and military use. The categories of aircraft expected to use the Half Moon Bay Airport during the planning period are Categories A and B.

The same advisory circular also describes six Airplane Design Groups (ADG's) according to the physical size of the aircraft. The airplane's wingspan is the principal characteristic affecting airfield design standards.

Group I: Up to but not including 49 feet.

Group II: 49 feet up to but not including 79 feet.

Group III: 79 feet up to but not including 118 feet.

Group IV: 118 feet up to but not including 171 feet.

Group V: 171 feet up to but not including 214 feet.

Group VI: 214 feet up to but not including 262 feet.

The groups of aircraft expected to use Half Moon Bay Airport will range from ADG I to ADG II.

The Airport Reference Code (ARC) is a coding system used to relate airport design criteria to the operational and physical characteristics of the airplanes expected to operate at an airport. The ARC has two components to the airport design aircraft. The first component is the aircraft approach category, (operational characteristic) and the second component is the ADG (physical characteristic). Generally, aircraft approach speed applies to runways and runway related facilities. ADG primarily affects the separation of airfield facilities.

Airport design criteria are more specifically determined by analyzing the aircraft mix and determining the most demanding airplane(s) to be accommodated. Although one type of aircraft may determine runway length, another may determine runway pavement strength or other appropriate design parameters. Based on the forecasts described in Chapter Two, and in accordance with the design criteria established in *FAA Advisory Circular 150/5300-13*, the Half Moon Bay Airport will have an ARC of B-II through-

out the planning period. The following paragraphs detail the criteria used to establish airfield dimensions and requirements.

RUNWAY

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

Runway Orientation

Wind conditions are of prime importance in determining runway orientation. Where prevailing winds are consistently from one direction, runways are generally oriented in that direction. In most areas, however, consistency of wind direction is not found. In such instances, a multiple runway system may be required. The Federal Aviation Administration (FAA) has established guidelines indicating that an airport runway system should provide 95 percent usability of the runway. The 95 percent wind coverage is computed on the basis of the crosswind not exceeding 10.5 knots for Airport Reference Codes (ARC) A-I and B-I, 13 knots for ARC A-II and B-II, and 16 knots for ARC A-III, B-III, and C-I through D-III.

According to the all weather windrose illustrated on **Exhibit 3B, Windrose**, Runway 12-30 meets the recommended wind coverage. There is no indication that there is a demand or need for a crosswind runway at Half Moon Bay Airport.

Airfield Capacity

The evaluation of airfield capacity presented in the Capacity/Demand section of this chapter outlined the capacity of the airport at current and long term stages of the planning period. Operations at Half Moon Bay Airport will reach a level at which planning for additional capacity should be given a priority consideration. The airport's ASV is currently 185,600 operations. The estimated operational level is currently about 21 percent of the ASV. With the establishment of a non-precision GPS approach, the ASV would increase to 219,100 operations. It is, therefore, expected that by the year 2015 the airport's ASV would increase to 219,100 operations. As previously stated, the FAA recommends that steps be initiated to increase capacity when operational levels reach 60 percent of the ASV or delays become excessive.

Runway Length

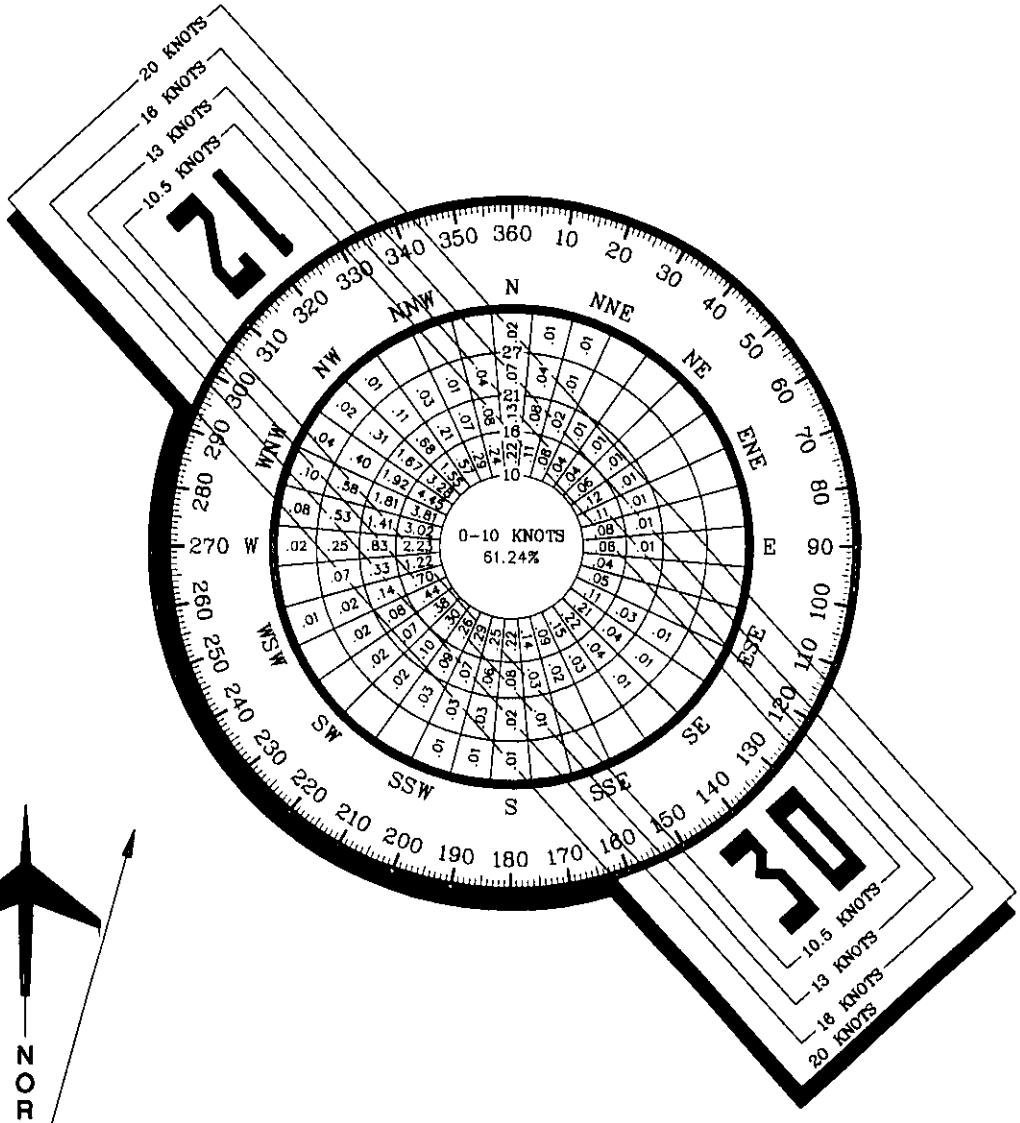
The determination of runway length requirements for the airport are based on four primary factors.

- Critical aircraft type expected to use the airport
- Mean maximum daily temperature of the hottest month
- Runway gradient
- Airport elevation

95MP01-3B-6/13/95

ALL WEATHER WIND COVERAGE

Runways	10.5 Knots	13 Knots	16 Knots	20 Knots
Runway 12-30	*89.45%*	*94.54%*	*98.06%*	*99.49%*



15° 36' East (March 1995)
Magnetic Variance
0.8' West (March 1995)
Annual Rate of Change

SOURCE:
NOAA National Climatic Center
Asheville, North Carolina
San Francisco International Airport
San Francisco, California

OBSERVATIONS:
70,127 All Weather Observations
4,235 IFR CAT-I Observations
1987 - 1994

HALF MOON BAY AIRPORT

Exhibit 3B
Windrose

The recommended length for a runway is determined by considering either the family of airplanes having similar performance characteristics or a specific airplane needing the longest runway. In either case, the choice should be based on airplanes that are forecast to use the runway on a regular basis. According to *FAA Advisory Circular 150/5325-4A, Runway Length Requirements for Airport Design*, a "regular basis" is considered to be at least 250 operations a year. An analysis of the existing and future fleet mix at Half Moon Bay Airport indicates that the turboprop aircraft fleet would influence the required runway length.

According to the aforementioned FAA Advisory Circular and referenced earlier, aircraft operating characteristics are affected by three primary factors: temperature, elevation and runway gradient. The mean maximum temperature of the hottest month at Half Moon Bay Airport is 62 degrees Fahrenheit. The airport elevation is 67 feet MSL and the runway gradient is 0.75 percent. **Table 3C, Runway Length Requirements**, outlines the runway length requirements for various categories of small aircraft according to the most current FAA criteria. As shown in the table, the most demanding small aircraft are those with 10 or more passenger seats. In order to accommodate these types of aircraft, a runway length of approximately 3,800 feet would be required. In addition, 75 percent of aircraft 60,000 pounds or less at 60 percent useful load would require a runway length of approximately 4,930 feet. The existing runway length of 5,000 feet should be maintained throughout the planning period to accommodate the occasional larger aircraft, as well as providing an additional safety margin.

Runway Width

According to *FAA Advisory Circular 150/5300-13*, a minimum runway width of 75 feet would meet the general aviation requirements over the planning period. It is recommended, however, that the existing runway width of 150 feet be maintained throughout the planning period. This will provide an extra safety margin for the existing and future aircraft fleet.

Runway Pavement Strength

As previously identified in the Inventory Chapter, Runway 12-30 has a pavement strength of 30,000 pounds single-wheel loading (SWL), 200,000 pounds dual-wheel loading (DWL) and 360,000 pounds dual-tandem wheel loading (DTWL). Currently, the airport has an administrative weight limitation of 12,500 pounds. It is not anticipated that aircraft over 12,500 pounds SWL will utilize the airport during the planning period. If, in fact, aircraft that weigh more than 12,500 pounds need to utilize the airport in the future, the existing pavement strength would accommodate those aircraft up to the weights previously listed. For the purposes of this study, it was assumed that the number of aircraft over 12,500 pounds will be minimal.

TABLE 3C
Runway Length Requirements
Half Moon Bay Airport

RUNWAY LENGTHS RECOMMENDED FOR AIRPORT DESIGN	
Small airplanes with less than 10 passenger seats	
75 percent of these small airplanes	2,240 feet
95 percent of these small airplanes	2,770 feet
100 percent of these small airplanes	3,280 feet
Small airplanes with 10 or more passenger seats	3,790 feet
Large airplanes of 60,000 pounds or less	
75 percent of these large airplanes at 60 percent useful load	4,930 feet
75 percent of these large airplanes at 90 percent useful load	6,130 feet
100 percent of these large airplanes at 60 percent useful load	5,050 feet
100 percent of these large airplanes at 90 percent useful load	6,950 feet
Reference: AC150/5325-4A, Runway length requirements for airport design.	

TAXIWAYS

Taxiways are constructed primarily to facilitate aircraft movement 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.

According to *FAA Advisory Circular 150/5300-13*, the taxiways should be 35 feet in width and provide a 240-foot separation between the runway and taxiway centerlines. All the taxiways at Half Moon Bay Airport are currently 50 feet in width, which will accommodate the aircraft mix forecast throughout the planning period. The current separation between the runway and the parallel taxiway is 550 feet. It is recommended that the taxiway width be maintained at 50 feet, thus providing an additional safety margin for the occasional larger aircraft.

NAVIGATIONAL AIDS

Airport and runway navigational aid requirements are based on recommendations as depicted in *DOT/FAA Handbook 7031.2C, Airway Planning Standards Number One*, and *FAA Advisory Circular 150/5300-13*. Navigational aids provide visual, non-precision, or precision guidance to a runway or the airport itself. The basic difference between a non-precision and precision navigational aid is that the latter provides electronic decent, alignment (course), and position guidance, while the non-precision navigational aid provides only alignment and position loca-

tion information. The necessity of such equipment is predicated on safety considerations and operational needs. The type, purpose and volume of aviation activity expected at the airport are factors normally used in the determination of the airport's eligibility for navigational aids.

Currently, there are no navigational aids at Half Moon Bay Airport providing instrument approach capabilities. Consideration is being given to providing a nonprecision GPS approach to at least one runway end in the short-term. Nonprecision GPS approach capability allows properly equipped aircraft the ability to approach to land at the airport as long as the visibility is at least one mile.

In addition to the GPS approach, an Automated Surface Observing System (ASOS) would also be recommended. The ASOS would provide real-time weather information to pilots through a radio frequency, as well as by telephone. This piece of equipment would be necessary in order to establish a nonprecision approach to the airport.

Glide path indicator lights are a system of lights located on the side of the runway which provide visual decent guidance information during an approach to the runway. Runway 30 is equipped with a four-light Visual Approach Slope Indicators (VASI-4). It is recommended that both runway ends be equipped with Precision Approach Indicator Lights (PAPIs) by the end of the planning period.

Runway End Identifier Lights (REIL's) are installed to provide rapid and positive identification of the approach end of the runway. REIL's are installed on Runway 30 at Half Moon Bay Airport at this time. If non-precision approaches are provided to both runway ends, then each runway end should be equipped with REILs.

MARKING AND LIGHTING

Lighting on runways, taxiways, and aprons is used to provide safety and security for aircraft movements during night operations. Medium Intensity Runway Lights (MIRL) are available on Runway 12-30. Also, the taxiway connectors associated with the runway system provide Medium Intensity Taxiway Lighting (MITL). It is recommended that MITLs be installed on the semi-parallel taxiway, as well as any new taxiways which may be constructed over the course of the planning period.

Airport pavement markings are associated with the type of approaches that can be done to that runway. Runway 12-30 is currently marked for visual approaches. Runway 12-30 should be planned for nonprecision markings after the establishment of a nonprecision GPS approach. These markings include runway designation, centerline, threshold, and aiming point markings.

Exhibit 3C, Airside Facility Requirements, at the end of this chapter, provides a summary of the airside requirements discussed in this section.

LANDSIDE FACILITY REQUIREMENTS

Components of the landside complex include the following types of facilities.

- T-Hangars
- Local and Itinerant Apron
- Terminal Building
- Vehicle Parking
- Fuel Storage

HANGARS

The space required for hangar facilities is dependent upon the number and type of aircraft expected to be based at the airport. Based upon an analysis of general aviation facilities and the current demand at Half Moon Bay Airport, percentages representing hangar requirements for various types of general aviation aircraft have been calculated.

General aviation airports have been experiencing an increasing trend toward the use of T-hangars. The principal uses of conventional hangars at general aviation airports are for large aircraft storage, storage during maintenance and for housing fixed based operator's activities

Currently, all of the locally based aircraft owners desire their aircraft stored in a hangar. Beware of the corrosive salt air, it was assumed that 100 percent of based aircraft at Half Moon Bay Airport would desire hangars. It was also assumed that 10 percent of the single-engine, 25 percent of the twin-engine aircraft and 100 percent of the helicopter and turbine powered aircraft would be stored in conventional hangars.

A planning standard of 1,500 square feet (SF) was used for T-hangars. Space requirements for conventional hangar space were based on 1,000 SF per single- engine and rotary wing aircraft, 2,000 SF per twin-engine and turboprop aircraft, and 2,500 SF per turbojet aircraft. In addition, service or maintenance hangar areas were estimated at 10 percent of the total hangar storage area. This maintenance hangar area will be in addition to the individual hangar facilities.

Table 3D, Forecast Hangar and Hangar Apron Requirements, outlines the projected hanger requirements throughout the planning period.

TABLE 3D
Forecast Hangar and Hangar Apron Requirements
Half Moon Bay Airport

	Available	1994	2000	2005	2010	2015
Based Aircraft	N/A	66	72	79	86	93
Aircraft to be Hangared						
Single-Engine	N/A	64	67	72	77	80
Multi-Engine	N/A	2	4	5	6	8
Turboprop	N/A	0	1	1	2	2
Turbojet	N/A	0	0	0	0	1
Rotorcraft	N/A	0	0	1	1	2
Total	N/A	66	72	79	86	93
T-Hangar Positions	61	59	63	67	74	78
T-Hangar Area (SF)	N/A	88,5400	94,500	100,500	111,000	117,000
Conventional Hangar Positions	N/A	7	9	12	12	15
Aircraft Storage Area (SF)	N/A	8,000	11,000	12,000	15,000	20,500
Aircraft Maintenance Area (SF)	N/A	9,700	10,600	11,700	12,500	13,800
Total Conventional Hangar Area (SF)	14,700	17,700	21,600	23,700	27,500	34,300

AIRCRAFT PARKING APRON

Adequate aircraft parking apron should be provided to accommodate those local aircraft not stored in hangars as well as transient aircraft. At Half Moon Bay Airport, the local aircraft parking is in one area and the transient aircraft can park in two separate tiedown areas. There are at total of 51 tiedowns available at Half Moon Bay Airport.

In determining future apron requirements, it is necessary to examine local and transient tiedown facilities as separate entities. The local apron should at least meet the demand established by the unhangared based aircraft. Since it was assumed that nearly all based aircraft would be stored in hangars, if available, therefore no additional local tiedowns are necessary.

Transient parking requirements can be determined from a knowledge of busy day operations. The number of transient spaces required at Half Moon Bay Airport was determined to be about 75 percent of the busy-day itinerant operations. A planning criterion of 360 SY per transient aircraft tiedown was used for the analysis presented in **Table 3E, Forecast Apron Requirements.** According to the table, there is not a sufficient number of tiedowns at Half Moon Bay Airport to meet the demand

through the year 2015. The ability to install additional transient tiedowns at the north and south end of the airport will be examined in the following chapter.

TABLE 3E
Forecast Apron Requirements
Half Moon Bay Airport

	Available	1994	2000	2005	2010	2015
Total Tiedowns	51	45	48	53	56	57
- Local	29	0	0	0	0	0
- Transient	22	45	48	53	56	57
Total Aircraft Apron (SY)	N/A	16,200	17,300	19,100	20,200	20,600

GENERAL AVIATION TERMINAL BUILDING

The general aviation terminal building serves several functions at an airport. Space is required for administrative and management offices, pilot's lounge and flight planning area, meeting facilities, food services, storage, restrooms, and various other needs. The methodology used to evaluate terminal building capacity generally calculates the square footage requirements for terminal facilities based on the number of design hour pilots and passengers forecast to use the facility. Space requirements were determined using 75 square feet per design hour passenger. **Table 3F, Terminal Building Requirements**, outlines the space requirements for a general aviation terminal building facility at Half Moon Bay Airport during the planning period. According to the table, the facility provides adequate space. Due to the age of the facility, however, a new terminal building may be necessary during the planning period.

TABLE 3F
Terminal Building Requirements
Half Moon Bay Airport

	Available	1994	2000	2005	2010	2015
Design Hour Pilots and Passengers	N/A	12	14	15	16	18
Terminal Building (SF)	4,000	900	1,050	1,125	1,200	1,350

AUTOMOBILE PARKING

The requirements for automobile parking at general aviation airports are largely dependent upon the level of operations in addition to the type of general aviation facilities and activities at the airport. General aviation terminal area parking facilities are determined under guidelines set forth in FAA publications, while the number of automobile parking spaces for other general aviation facilities would be based on other factors.

The terminal public parking area requirements were based upon the number of design hour pilots and passengers. The total number of parking positions was projected based on a demand of one space per design hour passenger and 350 square feet per automobile parking space. Additional parking space will be necessary to meet the demands of the restaurant activities.

General aviation parking requirements were calculated under the assumption that 10 percent of the based aircraft will require automobile parking positions at any one time. The amount of parking area required per space is the same as that used in determining terminal area parking requirements. **Table 3G, Public Vehicle Parking Requirements,** reflects parking facilities that are currently available and those that will be required in the future.

TABLE 3G
Public Vehicle Parking Requirements
Half Moon Bay Airport

	Available	1994	2000	2005	2010	2015
Pilots and Design Hour Passengers	N/A	12	14	15	16	18
Terminal Vehicle Spaces	60	12	14	15	16	18
Parking Area (SY)	N/A	470	454	585	625	700
General Aviation Spaces	N/A	7	7	8	8	8
Parking Area (SY)	N/A	275	275	315	315	315
Total Parking Spaces	60	19	21	23	24	26

FUEL STORAGE

Fuel at airports is normally stored in underground tanks. This practice has undergone a great deal of scrutiny in the past few years because of the potential for fuel leaks and contamination of soil and groundwater. Consequently, the installation, design and monitoring requirements from both the State and Federal government, related to underground fuel storage, have increased sig-

nificantly. The location of the fuel storage area depends upon the airport's operational activity and management procedures.

Future fuel storage requirements for Half Moon Bay were projected following an analysis of the historical fuel use characteristics at the airport for the past year. The average rate of fuel consumption for 1994 was 0.4 gallons per operation. This ratio can be expected to increase as the higher performance aircraft fleet increases. **Table 3H, Fuel Storage Requirements,** provides a forecast of the monthly fuel storage capacity that will be required at Half Moon Bay Airport. Storage requirements are based on a one month, on-hand supply; however, more frequent deliveries can reduce the fuel storage capacity requirement. As indicated in the table, the current fuel storage capacity of 10,000 gallons is adequate to meet the monthly fuel storage requirements through the year 2010. It is recommended that new storage tanks for both 100LL and Jet A fuel be installed that meet the monthly fuel storage requirements, as necessary.

TABLE 3H
Fuel Storage Requirements
Half Moon Bay Airport

	Available	1994	2000	2005	2010	2015
Annual Operations	N/A	38,271	42,000	46,000	50,000	54,000
Peak Month Operations	N/A	3,827	4,200	4,600	5,000	5,400
Average Fuel Ratio	N/A	0.4	0.8	1.5	2.0	2.5
Monthly Fuel Storage Requirements	10,000[1]	1,531	3,360	6,900	10,000	13,500

Note: [1] Total Fuel Storage Currently Available

The landside facility requirements that should be developed during the planning period are illustrated on **Exhibit 3D, Landside Facility Requirements**, at the end of this chapter.

AIRPORT ACCESS

Access to Half Moon Bay Airport is available off of the Cabrillo Highway, a segment of the Pacific Coast Highway. During the preparation of this study, the Devil's Slide portion of the highway was closed because of a collapse in the road, a periodic occurrence. Consideration being examined included (1) repairing the roadway in its current location, (2) constructing a by-pass roadway around the mountain, or (3) tunneling through the mountains with a new roadway. The determination for which method is constructed is well outside the scope of this master plan project. For the purposed of this study, it was assumed that roadway access of some form will be provided between the cities of Half Moon Bay and Pacifica.

SUPPORT FACILITIES

Airport support facilities are those that are not classified as airside or landside facilities, but do play an important role in the function of the airport. As Half Moon Bay Airport increases in operational activity, utility needs could be affected.

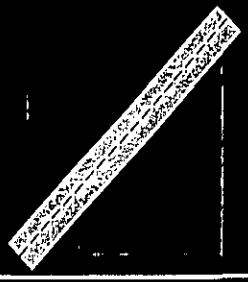
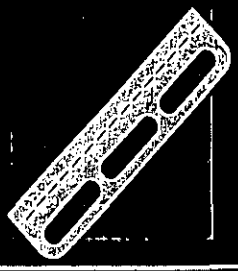
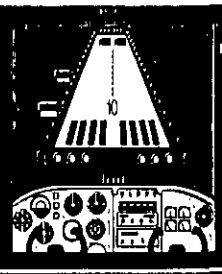
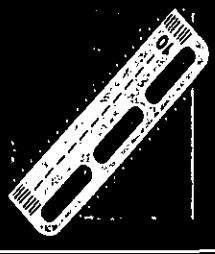
The utility systems serving the airport may be inadequate to serve the projected on-airport developments at the airport, as well as any significant amount of commercial/industrial development on or around the airport. Upgrading the utility systems would be recommended during the planning period, as necessary. Some of the typical upgrades include the installation of additional restrooms, water outlets, electrical outlets, phones, and sewer connections.

SUMMARY

The intent of this chapter is to outline the facilities required to meet aviation demands projected at Half Moon Bay Airport through the year 2015. A summary of airside and landside facility requirements are presented on **Exhibits 3C and 3D**.

The next step in the master planning process is to develop a direction for development to best meet these projected needs. The remainder of the master plan study will be devoted to outlining this direction, its schedule, and the associated costs.

95MP01-3C-2/18/97

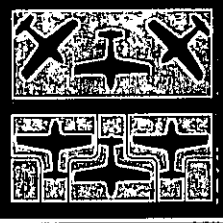
	EXISTING	2000	2005	2015
RUNWAYS 	**Runway 12-30** 5000' x 150' 30,000 lbs SWL 200,000 lbs DWL 360,000 lbs DTWL Aministrative restriction of 12,500lbs SWL	**Runway 12-30** 5000' x 150' 12,500 lbs SWL	**Runway 12-30** SAME	**Runway 12-30** SAME
TAXIWAYS 	**Runway 12-30** Semi. Parallel Connecting 50' width	**Runway 12-30** Full Parallel High Speed Connecting 50' width	**Runway 12-30** SAME	**Runway 12-30** SAME
NAVIGATIONAL AIDS 	Beacon **Runway 12-30** VASI (30) REIL (30)	Beacon, ASOS **Runway 12-30** GPS PAPI REIL	SAME **Runway 12-30** SAME	SAME **Runway 12-30** SAME
LIGHTING and MARKING 	**Runway 12-30** MIRL Visual **Taxiways** MITL Centerline	**Runway 12-30** MIRL Non Precision Edge **Taxiways** MITL Centerline Edge	**Runway 12-30** SAME **Taxiways** SAME	**Runway 12-30** SAME **Taxiways** SAME

HALF MOON BAY AIRPORT

Exhibit 3C
AIRSIDE FACILITY REQUIREMENTS

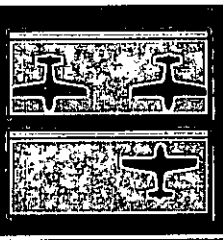
95MP01-3D-2/18/97

HANGARS



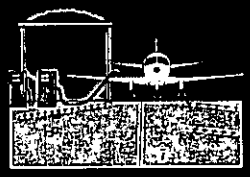
	EXISTING	2000	2005	2015
T-Hangars	61	63	66	76
Conventional Hangar (S.F.)	14,700	21,600	30,300	38,400

APRON TIE-DOWNS



Local Tiedowns	29	0	0	0
Itinerant Tiedowns	22	32	35	38
Total Tiedowns	51	32	35	38

FUEL STORAGE



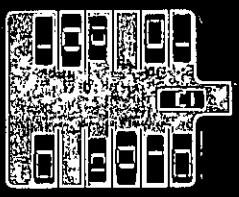
Monthly Fuel Storage Requirements (Gallons)	10,000*	3,360	6,900	13,500

* Existing On-Airport Capacity

GENERAL AVIATION TERMINAL

Total Terminal Area (S.F.)	4,000	1,050	1,125	1,350

AUTO PARKING



Total Parking Spaces	60	21	23	26
Terminal		14	15	18
General Aviation	N/A	7	8	8
Total Area (S.Y.)	N/A	729	900	1,015

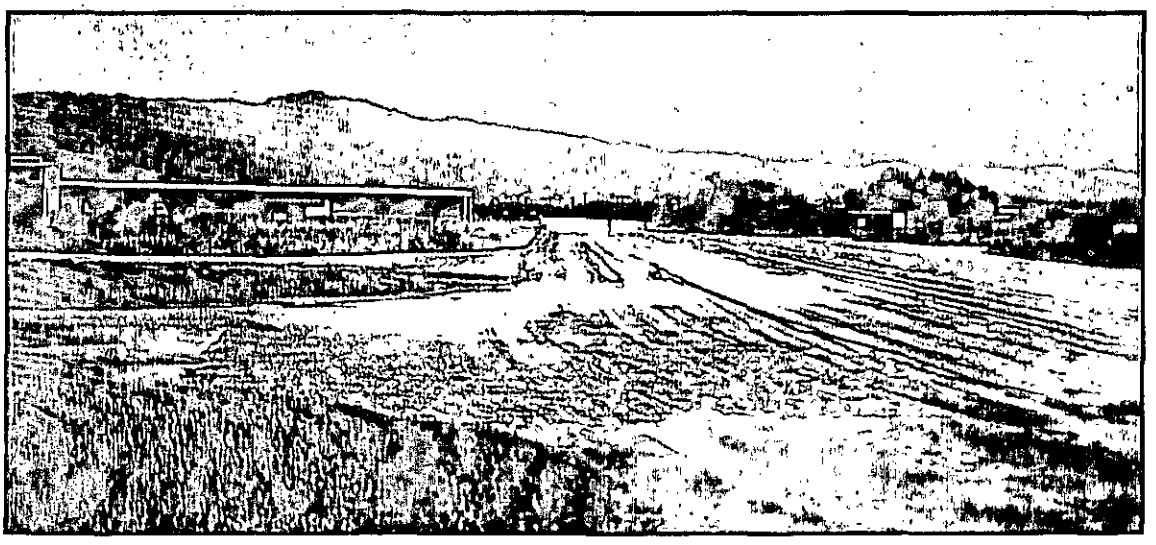
HALF MOON BAY AIRPORT

Exhibit 3D
LANDSIDE FACILITY REQUIREMENTS

SAN MATEO COUNTY
AIRPORTS
HALF MOON BAY

DEVELOPMENT ALTERNATIVES

DEVELOPMENT ALTERNATIVES



In the previous chapter, facility needs for the twenty-year planning horizon were identified. Having quantified these needs, the next step in the planning process is to identify and evaluate the various ways these facilities can be provided. The evaluation of alternatives may be the most important step in the planning process since decisions made in support of a development option will result in significant capital expenditures. A strong program for airport improvement must, therefore, be developed. This is accomplished through careful consideration of the advantages and disadvantages of various development alternatives.

The development alternatives presented in this chapter provide options for meeting both the short-term and long-term aviation demand at Half Moon Bay Airport. Development should be designed to be functional, cost-effective, and environmentally compatible. The alternatives must take into account many factors in order to be considered feasible for implementation, including both the airport's role in the aviation system and its ability to accommodate current and future activity. Alternatives must also be geared to provide flexibility to accommodate expansion beyond the requirements identified for the planning period, in order to meet any future needs. Finally, alternatives must be prepared in compliance with applicable Federal Aviation Administration (FAA) design standards, and other regulatory provisions.

These feasibility and flexibility factors are considered to be the most important elements of facility development. While not all-inclusive, they do provide a starting point from which to evaluate the proposed alternatives.

The possible combinations of development alternatives can be endless; therefore, some intuitive judgement must be used to identify those alternatives which have the greatest potential for implementation. The evaluation of alternatives is a process of deciding which options are most compatible with the community's goals and objectives for the airport. After the alternatives evaluation process, a selected airport concept can then be transformed into a realistic development plan.

There are many alternatives that can be conceived towards meeting the goal of accommodating current and future aviation demand at Half Moon Bay Airport; however, to provide a complete assessment, it cannot be assumed that the improvement of the existing facility comprises the only option. The range of alternatives also includes a *No Action* option and a scenario which investigates the relocation of aviation demand to another existing facility, or even to a new site.

The *No Action* and *Relocation of Services* alternatives evaluate whether it is possible to adequately accommodate aviation demand without further improvement of the existing airport. If these alternatives succeed in meeting the transportation and economic needs of the community, public and private investment might be minimized. Only after these two options have proved infeasible or imprudent should alternatives which analyze improving or expanding the existing airport facilities be considered.

NO ACTION

The *No Action* alternative considers the repercussions of maintaining the airport in its present condition and not providing for any improvement to the existing facilities. In the case of Half Moon Bay Airport, this means the airport would maintain its existing taxiway system which provides for only one exit taxiway and no full parallel taxiway. Also, the airport would be unable to meet either the local or a share of the regional demand for suitable hangar space. Such an approach would be inconsistent with the airport's current role within the San Francisco Bay region as a *Reliever Airport* and would also be contrary to the airport users needs.

Under this alternative, neither of the proposed exit taxiways nor the parallel taxiway would be constructed. The provision of these taxiway improvements would result in more convenient access between the airside and landside facilities by allowing aircraft to exit the runway without taxiing to the runway end and by providing improved access to the landside facilities. By not providing these facilities, implementation of the *No Action* alternative would result in aircraft remaining on the runway longer than necessary and would also require

aircraft to taxi in an area currently shared with automobiles, a notable safety concern. Also, the *No Action* would not provide an Automated Surface Observing System (ASOS) at the airport which gives pilots in the area current and accurate weather information. A number of landside improvements would also not be made, including: the replacement of the existing hangars, which are in poor condition, the provision of new hangars to meet future demand, the provision of automobile parking areas near the hangar facilities, or the expansion of the recreational aircraft parking areas.

The *No Action* alternative would result in adverse impacts to the economic health of the Mid-Coast and Half Moon Bay areas of western San Mateo County. In order to continue to attract general aviation business and vacation travelers, the airport's facilities must be adequate to accommodate their needs. This includes limiting the time needed to taxi an aircraft either into position on the runway for takeoff, or from the runway to the landside facilities. It will also be necessary to provide the business and recreational travelers with the landside facilities they need to meet their needs. Finally, it is also important to provide the business traveler with some form of instrument approach to the airport. The majority of business flights are done under instrument flight rules (IFR) and many of these users only utilize airport facilities with precision or nonprecision instrument approaches.

In order to attract the local users, it is imperative that the airport have sufficient hangar space of adequate quality. A number of the existing hangars at the airport are in poor condition due primarily to the corrosive salt air. It will be necessary to replace these units to provide local aircraft owners with adequate facilities to house their investments. To accomplish this, improvements to the existing airport facility would be necessary.

Finally, implementation of the *No Action* alternative would be inconsistent with investments which the County of San Mateo and the FAA have made over the preceding years to improve the airport facility.

Because implementation of the *No Action* alternative would result in a substandard aviation facility, this alternative was found to be neither feasible nor prudent.

RELOCATION OF SERVICES

The relocation of aviation services either to a new site or to another existing airport should also be considered as an alternative to improving the existing facility. While this option may be favored by those residing closest to the airport, the relocation of an airport is a complex and expensive alternative which can have far-reaching impacts.

In addition to the major financial investment, the development of a new airport also takes a commitment of extensive land area. The location of a new site is usually undeveloped, resulting in potential impacts to wildlife habitat, historical and cultural resources, and farmland. These impacts

are generally greater than at an existing site which has additional development capability, such as Half Moon Bay Airport. Also, because there is limited land between the foot of the Montara Mountains and the shore of the Pacific Ocean, the availability of suitable land convenient to both the local users and the business and recreation destinations would also be an issue. Western San Mateo County is extremely mountainous and little "flat" area is available for the construction of a new airport.

In addition, constructing a new airfield in the San Francisco Bay region may result in airspace impacts. The airport is currently located in an area of complicated airspace. Locating another facility in this area would prove extremely difficult and would likely have some affect on most other airports in the region.

Regional economic impacts may also be expected when relocating an airport facility. Airports provide an economic benefit and advantage to communities in which they are located. When airports are relocated, there is no guarantee the most feasible site will be located within the same community. The high costs associated with new airport development will also continue to limit the number of new facilities that the aviation industry and the public can absorb. It is prudent, therefore, to maximize the existing public investment to meet future needs, before abandoning that investment only to duplicate it elsewhere.

Finally, Half Moon Bay Airport is centrally located within the populated regions of the San Mateo County coastal areas. Should a natural disaster occur in the region, such as an earthquake or severe mud slides, it is conceivable that roads into and out-of the Mid-Coast and Half Moon Bay areas will become inaccessible. The proximity of Half Moon Bay Airport to these communities would allow emergency services and supplies to get into the area and evacuations to occur, as necessary.

The possibility of relocating either some or all services to another, existing airport in the area was also considered; however, it was determined to be neither feasible nor prudent. The nearest airports to Half Moon Bay Airport are San Francisco International and San Carlos, both located on the east side of the Montara Mountains. Access between the coastal area and these airports is via two roads which are not entirely reliable nor convenient. The travel time between San Carlos Airport and Half Moon Bay can exceed one hour when the Cabrillo Highway is closed at Devil's Slide and all traffic is using SR 92.

In addition, according to the recently completed *Metropolitan Transportation Commission Regional Aviation System Plan,* the general aviation airports in the San Francisco Bay region are unable to meet the current demand for hangar space. There are no vacant hangar units in the region. Half Moon Bay Airport not only has existing hangar facilities, but also has the ability

to construct additional hangars to meet all of the local demand and, at the same time, accommodate a portion of the regional demand. The ability of the remaining airports to meet the regional hangar needs without Half Moon Bay Airport, and to also accommodate either some or all of Half Moon Bay's based aircraft in the process, is uncertain.

Given the above considerations, it was determined that further development of the existing airport would accommodate future demands with far less capital improvements, expenditures, and impacts on other facilities and the airport users than would be occur in relocating the aviation services elsewhere.

AIRPORT DEVELOPMENT ALTERNATIVES

In formulating development alternatives, airside facilities are typically considered first because of their primary role in supporting and directing aircraft movements. Airfield development also physically dominates an airport's land uses; therefore, selection of an airfield layout would usually affect the amount and location of other types of uses.

At Half Moon Bay Airport, the primary airside improvement projects are the construction of a parallel taxiway and two exit taxiways to Runway 12-30. The existing taxiway system provides only one exit taxiway which is located at mid-field. Unfortunately, not all aircraft landing at Half Moon Bay Airport can slow down enough to turn onto the mid-field taxiway; therefore, additional exit taxiways, located between mid-field and the two runway ends, would provide an opportunity for these aircraft to exit the runway without having to continue to the runway end. In addition, the exit taxiways will enhance safety at the airport by separating the taxiing aircraft from aircraft in the process of landing.

The parallel taxiway will help separate the landside facilities from the airfield. It will also provide aircraft with a safe place to taxi, separate from the area where automobiles currently share the taxiways. Two engine run-up areas are also proposed at each runway end. Other airside improvements include the provision of an ASOS, the installation of PAPI-2's on each runway end, the relocation of the REILs on Runway 30 and the installation of REILs on Runway 12, construction of a heliport, and the provision for instrument approaches with visibilities minimums greater than one mile to each runway end. It is expected that these approaches will be provided by GPS technology. By providing GPS approaches to Half Moon Bay Airport, pilots will have the ability to operate at Half Moon Bay Airport during some foggy or poor weather conditions.

Another notable airside improvement is the removal of the displaced thresholds from each runway end. Based on discussions with airport officials and historical correspondance, the displacements were originally provided in conjunction with the 12,500 pound weight restriction and airport overlay

zoning revisions. The intent was to "limit" the airport to small aircraft only, thus reducing noise impacts to the surrounding community, as well as to limit the types of development within the airport overlay zone. By removing these displaced thresholds, however, pilots conducting touch-and-go operations would be able to reach a greater altitude prior to leaving airport property, thus reducing noise impacts to the surrounding area. Likewise, arriving aircraft could reduce power, rather than holding power in order to reach the existing displacement. In addition, the airport would continue the 12,500 pound weight restriction.

Proposed landside improvements relate primarily to the provision of hangar space and tiedowns for itinerant aircraft pilots and passengers destined for Princeton-by-the-Sea and Montara. Automobile parking and access also features prominently in the landside improvements. In addition, it is anticipated that the County Sheriff's department will continue to operate a substation at the airport, as well as their drivers training program and vehicle storage facility area. Due to the potential for increased aircraft activity at the airport, extreme caution should be exercised during the drivers training activity. If the sheriff's department would need additional storage or training area, an examination should be conducted to determine the ability to provide additional area at the south end of the airport.

As stated in the previous chapter, the existing terminal building would appear to provide adequate space for the anticipated uses throughout the planning period. The age of the terminal building, however, may require that a new terminal facility be provided to meet the needs throughout this 20-year period. If in fact a new terminal in necessary, it is expected that it would be built in the same location, therefore, no new terminal building is identified on the following alternatives.

Airport property separated by access roads or remotely located are identified for non-aviation commercial/industrial development. Some of these parcels are currently being leased for agricultural purposes and an automobile parking lot. As a part of improving access, emergency vehicle access should be provided to the west side of the airport property.

Three airport development alternatives have been prepared which meet the facility requirements for Half Moon Bay Airport over the planning period. The primary differences between the alternatives is the design of the parallel taxiway and the location of new hangars and parking facilities. All three alternatives assume that the existing port-a-port hangars and the "Andreni" hangars will ultimately be removed and replaced with new T-hangars. These older hangars are considered to be in too poor of condition to attempt to restore or relocate elsewhere on the airport. These hangars would continue to be utilized until they become unsafe or unrepairable.

At the time the *Draft Half Moon Bay Airport Master Plan* document was taken before the San Mateo County Board of Supervisors, the Midcoast Community Council proposed a fourth development alternative. This alternative is both illustrated and discussed in **Appendix C**. Briefly, this alternative represents a scaled down version of the three development alternatives discussed in the following sections. It is distinguished from these other alternatives because (1) it retains the displaced thresholds, (2) it eliminates the provision of a prallel taxiway, and (3) it eliminates any commercial/industrial or aviation-related development on the north end of the airport.

At their July 22, 1997 hearing on the draft document, the San Mateo County Board of Supervisors indicated that Alternative D should be evaluated as part of the environmental review process required under the *California Environmental Quality Act*.

AIRPORT DEVELOPMENT ALTERNATIVE A

Alternative A is illustrated on **Exhibit 4A, Airport Development Alternative A**. On the airside, this alternative provides for the parallel taxiway by connecting potions of the existing taxiway system. The result is a *semi-parallel* taxiway, meaning that the taxiway is not equidistant from both runway ends, but does serve the same function as a parallel taxiway. In addition, this alternative provides for the two exit taxiways, the two run-up areas, and a connecting taxiway from the new parallel taxiway to the general aviation terminal and FBO area. A heliport is located south of the terminal building, near the existing access gate.

The primary landside improvement associated with this alternative is the expansion of the existing hangar complex on the southeast end of the airfield. Four hangar buildings, comprising 56 T-hangar units, are proposed. Some of these units are intended to replace the existing port-a-ports and the Andreni hangars, as well as to meet the forecast hangar demand. A T-hangar expansion area has also been identified to accommodate needs beyond the 20-year planning period.

Other landside improvements include the construction of two 10,000 square foot conventional hangars between the Half Moon Bay Aero hangar and the tiedown ramp. These hangars are expected to be used for aviation-related services and/or aircraft storage. The existing recreational aircraft parking area, located on the southeast end of the airport, would be expanded to accommodate 16 additional aircraft. This ramp is used by pilots/passengers with destinations in Princeton-by-the-Sea. A second recreational aircraft parking area is proposed on the northwest end of the airfield to accommodate 8 aircraft. This ramp would be convenient to the communities of Moss Beach and Montara. The addition of this ramp would also include a pedestrian trail and access gate at the north end of the airport.

Access and roadway circulation improvements are also proposed. The current frontage road which accesses the West Coast Aviation and Half Moon Bay Aero hangars is planned to be extended northwest, along the Cabrillo Highway. The roadway extension would access the area planned for commercial and industrial development. It is also proposed to extend this roadway southeast to Capistrano Road in Princeton-by-the-Sea. The purpose of this extension is to provide an automobile access road to the hangar area, thereby eliminating the need for automobile traffic to use the taxiway. The roadway extension would also provide a secondary means of access to the airport. Currently, the airport has only one access onto Cabrillo Highway. Should this access be closed off for any reason, such as an accident, access to and from the airport would be blocked. Extending the frontage road would allow for access onto a secondary road, thereby avoiding a second curb-cut on the Cabrillo Highway.

Finally, improvements to the availability of automobile parking areas is also proposed under Alternative A. Automobile parking is proposed near the four conventional hangars (two existing, two proposed). This would allow automobiles to access the facilities without having to access them from the airside. This improvement will enhance safety by separating automobiles and aircraft.

The primary advantage to this alternative is that it provides the benefits of a parallel taxiway at the least cost by making use of the existing taxiway system, as much as is possible. With the addition of the exit taxiways, this alternative provides easy and convenient access between the airfield and the landside facilities. Another advantage to this alternative is that it locates the heliport in close proximity to the terminal building and to vehicular access, as is recommended by FAA design guidelines. A common user of airport heliport facilities is the medical evacuation helicopter which benefits from good roadway access for its related ambulances. Roadway access to Captistrano Road is also an advantage to this alternative. As stated earlier, this secondary means of access ensures that the airport will be accessible to local users.

The most notable disadvantage to this alternative is that it does not provide automobile parking in the T-hangar area. This alternative assumes that pilots and passengers will continue to utilize the existing taxiway and taxilane system to access their hangar units and to park their vehicles. Vehicle parking along taxilanes creates potential conflict and safety concerns for pilots operating their aircraft.

AIRPORT DEVELOPMENT ALTERATIVE B

Alternative B, illustrated on **Exhibit 4B, Airport Development Alternative B**, is very similar to Alternative A, with the primary differences being the location of the conventional hangars and the design of the T-hangar area.

95MP01-4A-1-22-97

LEGEND:

1. CONVENTIONAL HANGAR
2. T-HANGAR
3. T-HANGAR EXPANSION AREA
4. AUTO PARKING
5. COMMERCIAL/INDUSTRIAL DEVELOPMENT AREA
6. HELIPORT
7. RECREATIONAL AIRCRAFT PARKING

AIRPORT PROPERTY LINE

NOTE: ALL PORT-A-PORTS AND THE T-HANGAR AT MIDFIELD ARE ULTIMATELY TO BE REMOVED AND THEREFORE ARE NOT SHOWN FOR CLARITY.

MOSS BEACH

DENNISTON CREEK

SAN VICENTE CREEK

BRIDGEPORT DR.

CORAL REEF

SONORA AVE.

ETHELDORE ST.

CABRILLO HIGHWAY

ACCESS ROAD

CAPISTRANO

EXIST. DISPLACED THRESHOLD TO BE REMOVED

ULT. RPZ 250' X 1000' X 450' VISIBILITY NOT LESS THAN ONE MILE

ULT. ASOS

Exist. VASI-4

ULT. PAPI-2

EXIST. 5000' X 150' RUNWAY

AIRPORT ST.

ULT. REIL

EXIST. DISPLACED THRESHOLD TO BE REMOVED

RELOCATED REIL

ULT. PAPI-2

CALIFORNIA AVE.

CORNELL

PRINCETON

STANFORD

POINT AVE.

WEST

HALF MOON BAY

CYPRESS AVE.

MARINE BLVD.

REDONDO PARK

BEACH WAY

LOS BANOS AVE.

BERNAL AVE.

OCEAN BLVD.

DERECHO ST.

LA GRANADA

BARRANCA ST.

CULEBRA ST.

NORTH

0 600 1200

SCALE IN FEET

PACIFIC OCEAN

JAMES V. FITZGERALD MARINE RESERVE

HALF MOON BAY AIRPORT

Exhibit 4A
AIRPORT DEVELOPMENT ALTERNATIVE A

95MP01-4B-1-22-97

LEGEND:

1. CONVENTIONAL HANGAR
2. T-HANGAR
3. T-HANGAR EXPANSION AREA
4. AUTO PARKING
5. COMMERCIAL/INDUSTRIAL DEVELOPMENT AREA
6. HELIPORT
7. RECREATIONAL AIRCRAFT PARKING

AIRPORT PROPERTY LINE

NOTE: ALL PORT-A-PORTS AND THE T-HANGAR AT MIDFIELD ARE ULTIMATELY TO BE REMOVED AND THEREFORE ARE NOT SHOWN FOR CLARITY.

MOSS BEACH

DENNISTON CREEK

SAN VICENTE CREEK

BRIDGEPORT DR.

CORAL REEF

SONORA AVE.

ETHELDORE ST.

CABRILLO HIGHWAY

ACCESS ROAD

CAPISTRANO

MARINE BLVD.

CYPRESS AVE.

ULT. RPZ
250' X 1000' X 450'
VISIBILITY NOT LESS
THAN ONE MILE

ULT. PAPI-2

ULT. ASOS

Exist. VASI-4

EXIST. DISPLACED THRESHOLD TO BE REMOVED

ULT. RPZ
250' X 1000' X 450'
VISIBILITY NOT LESS
THAN ONE MILE

CALIFORNIA AVE.

CONNELL

EXIST. 5000' X 150' RUNWAY

AIRPORT ST.

ULT. PAPI-2

ULT. REIL

EXIST. DISPLACED THRESHOLD TO BE REMOVED

RELOCATED REIL

PRINCETON

DERECHO ST.

REDONDO PARK

LOS BANOS AVE.

BEACH WAY

BERNAL AVE.

OCEAN BLVD.

LA GRANADA

BARRANCA ST.

CULEBRA ST.

STANFORD

POINT AVE.

WEST

HALF MOON BAY

PACIFIC OCEAN

NORTH

0 600 1200

SCALE IN FEET

JAMES V. FITZGERALD MARINE RESERVE

HALF MOON BAY AIRPORT

Exhibit 4B
AIRPORT DEVELOPMENT ALTERNATIVE B

As with Alternative A, Alternative B provides for the parallel taxiway by connecting two portions of the existing taxiway system. It also provides for the same run-up areas, exit taxiways, and heliport location. In addition, Alternative B locates 16 aircraft tiedowns on the southeast end of the airfield and 8 aircraft tiedowns on the northwest end of the airfield. These parking areas are intended to serve the recreational travelers desiring access to Princeton-by-the-Sea and Montara/Moss Beach.

Alternative B also provides for the northwest and southeast extensions to the existing access road. Again, the purpose of the northwest extension is to provide access to the planned commercial/industrial development area. The southeast extension is to provide access to the T-hangar area and to provide a secondary means of access to the airport from Capistrano Road.

Alternative B differs from Alternative A in the location and size of the conventional hangar and in the design of the T-hangar area. Alternative B provides for an 18,000 square foot conventional hangar between the existing Half Moon Bay Aero and West Coast Aviation hangar, west of the terminal building. A second conventional hangar of 24,000 square feet is proposed for the west end of the T-hangar area. Both hangars would be developed with automobile parking areas off of the frontage road. The total size provided by these two hangars would meet the forecast demand through the planning period, assuming the two existing hangars were removed.

The design of the T-hangar area provides an area for automobile parking in the middle of the complex. As with Alternative A, 56 new T-hangar units are proposed for four new hangar buildings located west of the existing hangars. Alternative B, however, differs from Alternative A in that the future T-hangar expansion area is shown on the east side of the existing hangar buildings. Again the 56 hangars are expected to accommodate both the future demand and those aircraft relocated from the port-a-ports and the Andreni hangars.

As with the first alternative, a primary advantage to Alternative B is that it provides for the benefits of a parallel taxiway at less than the cost of constructing an entire taxiway. By being near both the access gate and the terminal building, Alternative B also locates the heliport in a convenient location for the itinerant users, including emergency evacuation helicopters. Another benefit of this alternative is the provision of roadway access to Capistrano Road in Princeton-by-the-Sea.

Alternative B addresses a disadvantage of Alternative A by locating automobile parking areas in the T-hangar complex. This parking area will allow pilots and passengers convenient access to their aircraft from the access road, thereby reducing the potential for conflict between automobiles and aircraft.

The primary disadvantage to this alternative is that is locates the future T-hangar expansion area even further from the terminal building and FBO

services than the existing hangar buildings. Aircraft pilots rely on FBO's for fueling, maintenance and supplies. Ideally, aircraft should be hangared near the service providers. This disadvantage is potentially off-set by the construction of a conventional hangar on the southeast end of the airfield for use by the airport's FBO or other service provider.

AIRPORT DEVELOPMENT ALTERNATIVE C

Alternative C is illustrated on **Exhibit 4C, Airport Development Alternative C**. The primary difference between this alternative and the two previous alternatives is that is provides for a full-parallel taxiway to Runway 12-30. This taxiway would be equidistant from both ends of the runway.

As with Alternatives A and B, this alternative provides for the two run-up areas, the two new exit taxiways, and the taxiway access between the terminal/FBO area and the parallel taxiway. This alternative also provides for the 24 recreational aircraft tiedown spaces, 16 on the southeast end and 8 on the northwest end. It also provides for the northwest extension of the frontage road to access a commercial/ industrial development area.

The primary difference between Alternative C and the previous alternatives is that it provides for only a partial extension of the frontage road to the southeast, ending the road at the T-hangar complex. Under this alternative, no secondary means of access to the airport would be provided.

The T-hangar complex under Alternative C is similar to that of Alternative A with the four new buildings and the future expansion area located west of the existing hangar buildings. It differs in that the hangars are divided by two automobile parking areas. As discussed earlier, this parking would be convenient to the pilots and passengers accessing aircraft in the hangar area, while still separating the automobiles from the aircraft. Parking areas would also be provided near the two conventional hangars located west of the terminal building.

Under Alternative C, a heliport and four helipads would be located near the existing Andreni hangars, which are to be removed. This facility could be served by one of the proposed conventional hangars. Access to this area for emergency vehicles would need to be provided from the existing gate and across the transient ramp, or, preferred, from a new gate located in the vicinity of the new hangar.

The primary advantages to this alternative is that is provides ample parking in the T-hangar area and adjacent the new conventional hangars.

The disadvantages to this alternative are that it provides the benefits of a parallel taxiway at the greatest cost of the three alternatives, that the T-hangars are removed from any existing or potential future FBO provider, and

95MP01-4C-1-22-97

LEGEND:

1. CONVENTIONAL HANGAR
2. T-HANGAR
3. T-HANGAR EXPANSION AREA
4. AUTO PARKING
5. COMMERCIAL/INDUSTRIAL DEVELOPMENT AREA
6. HELIPORT
7. RECREATIONAL AIRCRAFT PARKING

AIRPORT PROPERTY LINE

NOTE: ALL PORT-A-PORTS AND THE T-HANGAR AT MIDFIELD ARE ULTIMATELY TO BE REMOVED AND THEREFORE ARE NOT SHOWN FOR CLARITY.

MOSS BEACH

SAN VICENTE CREEK

DENNISTON CREEK

BRIDGEPORT DR.

CORAL REEF

SONORA AVE.

ETHELDORE ST.

CABRILLO HIGHWAY

ACCESS ROAD

ACCESS ROAD

CAPISTRANO

ULT. RPZ
250' X 1000' X 450'
VISIBILITY NOT LESS
THAN ONE MILE

ULT. ASOS

EXIST. DISPLACED
THRESHOLD TO
BE REMOVED

Exist. VASI-4

ULT. PAPI-2

EXIST. 5000' X 175' RUNWAY

ULT. PAPI-2

AIRPORT ST.

CALIFORNIA AVE.

CORNELL

PRINCETON

MARINE BLVD.

CYPRESS AVE.

REDONDO PARK

ULT. REIL

EXIST. DISPLACED
THRESHOLD TO
BE REMOVED

DERECHO ST.

RELOCATED REIL

STANFORD

BEACH WAY

LOS BANOS AVE.

BERNAL AVE.

LA GRANADA

BARRANCA ST.

CULEBRA ST.

POINT AVE.

WEST

OCEAN BLVD.

NORTH

0 600 1200

SCALE IN FEET

PACIFIC

OCEAN

HALF MOON BAY

JAMES V. FITZGERALD MARINE RESERVE

HALF MOON BAY AIRPORT

Exhibit 4C
AIRPORT DEVELOPMENT ALTERNATIVE C

that a secondary means of access to the airport facility is not provided.

AIRPORT DEVELOPMENT COSTS

Table 4A, Airport Development Cost Comparison, provides an *order of magnitude* cost estimate for each of the three airport alternatives. These reflect *general* cost estimates for site preparation and airport development and should be used for comparison purposes only. As shown in the table, the cost of the three alternatives range from a low of $5.5 million for Alternative A to a high of $7.7 million for Alternative B. Greater detail on the development cost and funding eligibility is provided in Chapter Six, Financial Management and Development Program.

TABLE 4A
Airport Development Cost Comparison
Half Moon Bay Airport

Item	Alternative A	Alternative B	Alternative C
Taxiway Extension	$656,300	$656,300	$923,600
Run-up Areas	$48,000	$48,000	$48,000
Connector Taxiways	$249,200	$249,200	$249,200
Relocate Threshold Lights	$30,000	$30,000	$30,000
Relocate REILS	$10,000	$10,000	$10,000
PAPIs	$60,000	$60,000	$60,000
ASOS	$150,000	$150,000	$150,000
MITLs	$326,000	$326,000	$422,200
Runway Markings	$40,000	$40,000	$40,000
Heliport	$75,000	$75,000	$100,000
Utility System Upgrades	$250,000	$250,000	$250,000
T-Hangars	$1,120,000	$1,120,000	$1,120,000
Conventional Hangars	$1,875,000	$3,937,500	$2,343,800
Recreational Aircraft Tiedowns	$65,000	$65,000	$65,000
Access Roads	$525,000	$525,000	$369,500
Automobile Parking	$62,500	$118,100	$152,800
TOTAL[1]	**$5,542,000**	**$7,660,100**	**$6,334,100**

Note: [1] Cost estimates include an additional 25% for engineering and contingency.

RECOMMENDED AIRPORT DEVELOPMENT ALTERNATIVE

Airport Development Alternative B is the recommended development plan for Half Moon Bay Airport. Alternative B address the disadvantages of the other two alternatives. Contrary to Alternative C, Alternative B provides for an economical way of getting the benefits of a parallel taxiway by utilizing parts of the existing taxiway system. It also locates the heliport in a more convenient location for the itinerant user: near the terminal building and the access gate. In addition, Alternative B provides for the secondary airport access off of Capistrano Road.

Alternative B is recommended over Alternative A because it provides for automobile parking areas adjacent to the T-hangar complex. It also provides for a future conventional hangar building near the T-hangars which can be utilized as a future FBO site in order to provide convenient services to the local airport users. Alternative B is the most expensive of the three alternatives; however, the majority of this cost is related to the development of the conventional hangars. These are typically constructed by the private sector, resulting in no actual cost to the airport sponsor.

SUMMARY

This chapter has examined three airport alternatives, each incorporating different airside and landside concepts which attempt to satisfy the facility requirements throughout the planning period. Current FAA airport design standards were considered throughout the analysis of each alternative. Safety, both air and ground, were given highest priority in the analysis of each of the alternatives presented. Airport Development Alternative B was selected because it address the disadvantages of the other two alternatives.

The remaining chapters will refine the recommended development plan and provide the financial management tools necessary to ensure implementation and proper timing of each project in the development program.

SAN MATEO COUNTY
AIRPORTS
HALF MOON BAY

AIRPORT PLANS

HALF MOON BAY AIRPORT

AIRPORT PLANS

In Chapter Four, a recommendation was made for the future development of Half Moon Bay Airport. As determined in the previous chapters, new airside and landside facilities will be necessary to meet the ultimate forecast demand. The purpose of this chapter is to describe, in narrative and graphic form, the recommended development through the 20-year planning period.

A set of plans, referred to as **Airport Layout Plans**, has been prepared to graphically depict the recommended airfield layout, disposition of obstructions and uses of land within the proposed airport property. This set includes the following.

- Airport Layout Plan
- Terminal Area Plan
- Part 77 Airspace Plan
- Approach Zones Plans
- Runway Protection Zones Plans
- On-Airport Land Use/Noise Plan
- Airport Property Map

The airport layout plan set has been prepared on a computer-aided drafting system for future ease of use. The computerized plan set provides a detailed layout of existing and future facilities on multiple layers that permit the user to focus in on any section of the airport at any desirable scale. The plan set can be used as base information for design and can be easily updated in the future to reflect new development. The plan set is also provided in 24-inch x 36-inch reproducible hard copy in accordance with current FAA standards.

DESIGN STANDARDS

The design standards applied to the development of Half Moon Bay Airport are prescribed in **FAA Advisory Circular 150/5300-13, Airport Design.** These standards are based upon several factors which include the approach speed, operating weights and wingspan of the design aircraft.

Based on forecast aviation demand, Half Moon Bay Airport would ultimately be expected to serve aircraft in Approach Category B (approach speeds between 91 and 121 knots). In addition, a number of aircraft anticipated to operate at the airport would be in Airplane Design Group II (aircraft with wingspans less than 79 feet). The airfield facilities were, therefore, designed to accommodate B-II aircraft. The administrative restricted load bearing strength of the runway should be maintained at 12,500 pounds single-wheel loading (SWL), which should accommodate the anticipated types of aircraft during the planning period.

The FAA design standards used in planning the airside facilities are listed in **Table 5A, Airport Design Standards.** Those existing facilities that do not meet the current standards are identified within the "Modifications to FAA Standards" block on the Airport Data Sheet. Modifications to FAA Standards are methods of requesting an FAA review of the specific standard(s) to determine if there are any actual hazards to navigable airspace or overall airport safety.

TABLE 5A
Airport Design Standards
Half Moon Bay Airport

Descriptor	B-II Standards	Existing 12-30	Ultimate 12-30
Runway Length (ft)	N/A	5,000	5,000
Runway Width (ft)	75	150	150
Runway Strength (thousand lbs)[1]	N/A	12,500 SWL	12,500 SWL
Runway Safety Area Length (beyond the end of the runway (ft))	300	300/300	300/300
Runway Safety Area Width (ft)	150	150	150
Runway Object Free Area Length (beyond the end of the runway (ft))	300	300/300	300/300
Runway Object Free Area Width (ft)	500	500	500
Runway Protection Zones	N/A	V/V	NP/NP
Parallel Taxiway Width (ft)	35	50	50
Parallel Taxiway Strength (lbs)	N/A	12,500 SWL	12,500 SWL
Runway Centerline to:			
Parallel Taxiway (ft)	240	550	550
Aircraft Parking (ft)	250	250	250
15-Foot Building Restriction Line (ft)[2]	355	355	355
Taxiway Centerline to:			
Parallel Taxiway/Taxilane (ft)	105	105	105
Fixed or Movable Object (ft)	65.5	65.5	65.5

Notes: SWL - Single Wheel Loading, V - Visual, NP - Non-precision, N/A - Not Applicable
[1] - Administratively restricted.
[2] - The Building Restriction Line (BRL) provides adequate non-precision approach imaginary surface clearance for a 15-foot tall building. The BRL may be adjusted for buildings/objects of lesser height in relationship to the runway elevation at that location.
Source: FAA AC 150/5300-13, Chg. 4, Airport Design

AIRPORT LAYOUT PLAN

The *Airport Layout Plan (ALP)* graphically presents the existing and planned airport layout and depicts the recommended improvements needed to meet forecast aviation demand. Detailed airport and runway data are provided on the *ALP* (**Sheet No. 1**) to describe the ultimate airport development planning recommendations.

The *ALP* is an overview of the proposed development of the airport through the year 2015. It does not depict the various stages of development leading to the completion of the 20-year plan. Additional exhibits in this report show these development stages in detail (see Chapter Six). The following discusses the airfield related development recommendations.

RUNWAY 12-30

Runway 12-30 is planned to be utilized by a variety of general aviation aircraft. Airside development includes the ultimate removal of both displaced thresholds to Runway 12-30. Additional airside improvements include the construction of a parallel taxiway and exits, as well as the installation of runway and taxiway lighting.

Precision Approach Path Indicators (PAPIs)will be installed on both runway ends and new Runway End Identifier Lights (REILs) will be installed on Runway 12, with the REILs on Runway 30 being relocated to the new threshold.

AIRFIELD DEVELOPMENT STAGING

The 20-year planning period has been divided into three stages: Stage I, Stage II and Stage III. Each stage and associated airside development item are described in the following paragraphs.

Stage I, the first five year period of the development program, has been further divided into individual fiscal years, FY1996/97 through FY2000/01. Stage I includes the following major airside development items; the removal of both displaced thresholds, the construction of a parallel taxiway and connectors, and installation of MIRLs, MITLs, REILs and PAPIs.

Projects identified in the **Stage II** development program encompass the five year period from FY2001/02 through FY2005/06. There are no major airside development projects included during Stage II, however, pavement preservation is expected to occur during this stage.

Stage III contains projects for the longer range needs of the airport that will be accomplished during the period FY2007 to FY2015. There are no major airside development projects included in Stage III, however, pavement preservation is expected to occur during this stage.

TERMINAL AREA PLAN

The *Terminal Area Plan*, **Sheets No. 2**, represents a refinement of the selected development configuration and provides a more detailed drawing of the terminal area facilities on the north side of the airport. The following is the suggested staging.

Stage I landside development consists of the beginning phase of T-hangar/ shade development, and the improvements to access, auto parking, and utility systems.

Projects identified in the **Stage II** development program include the continued development of T-hangars, extension of the access road , and additional auto parking.

Stage III terminal area development includes the construction of additional conventional hangar facilities, extension of the access road, and additional auto parking.

PART 77 AIRSPACE PLAN

The *Part 77 Airspace Plan* for Half Moon Bay Airport, **Sheet No. 3**, is based on **F.A.R. Part 77, *Objects Affecting Navigable Airspace***. The intent of these regulations is to protect the airspace and approaches to each runway from hazards that could affect the safe and efficient operation of the airport.

The *Part 77 Airspace Plan* is a graphic depiction of the imaginary surfaces described for various airport geometric planes, such as the runway (primary and transition surfaces), approach (approach surface) and the airport (horizontal and conical surfaces). Design criteria for surface heights, angles, and radii on this plan are determined by the airport category and runway approach classification.

The *Part 77 Airspace Plan* for Half Moon Bay Airport is based on small aircraft (aircraft less than 12,500 pounds) non-precision approaches to both runway ends. This drawing will permit the County to readily determine if construction of a proposed structure in the vicinity of the airport would penetrate any of the protected airspace surfaces.

The obstructions recorded at Half Moon Bay Airport are indicated on **Sheet No. 3**. Those obstructions that pertain to the runway protection zones and approach zones are explained in greater detail on the appropriate drawings that follow. Obstructions to the other airspace surfaces are describe briefly below.

PRIMARY SURFACES

The primary surface for Runway 12-30 at Half Moon Bay Airport is 500 feet in width, extends 200 feet beyond each runway end and is centered on the runway. In addition, the elevation of the primary surface is the same as the elevation along the associated part of the runway.

Situated adjacent to the runway and taxiway system, the primary surface should remain clear of most objects in order to allow unobstructed passage of aircraft. Within the primary surface, objects are only permitted if they are no taller than two feet above the ground, and if they are constructed on frangible (breakaway) fixtures. The only exception to the two-foot height requirement is for objects whose location is fixed by function. VASIs and PAPIs are examples of such objects within the category of "fixed by function".

TRANSITION SURFACE

The transition imaginary surface is a surface used to join two other surfaces together. The transition surface joins the primary surface to the approach and horizontal surfaces. The transition surface rises at a slope of one foot vertically for each seven feet horizontal distance (7:1), up to a height which is 150 feet above the highest runway elevation.

HORIZONTAL SURFACE

The horizontal surface is established at 150 feet above the highest runway elevation or 217 feet MSL. Having no slope, the horizontal surface connects the transitional and conical surfaces. The horizontal surface has a radius of 5,000 feet from the ends of each runway, with a tangent line connecting the arcs.

CONICAL SURFACE

The conical surface for Half Moon Bay Airport is 4,000 feet in length and slopes away from the horizontal surface at one foot vertical for each twenty feet horizontal (20:1). The conical surface rises to a height of 350 feet above the established airport elevation or to 417 feet MSL.

APPROACH ZONE PLANS

The *Approach Zones Profiles*, **Sheet No. 4**, represents the approach surface profiles off each end of the runway. The plan depicts the physical features near each runway's extended centerline, including significant topographic changes, roadways, etc. The dimensions and angles of the approach surfaces are prescribed in F.A.R. Part 77 and depend upon the runway instrumentation and the type of aircraft served.

The approach slopes for the non-precision approach to Runway 12-30 extend 5,000 feet from the primary surface, and rises at a slope of one foot vertically for each 20 feet of horizontal distance (20:1). The inner width of the approach surface is 500 feet, whereas the width of the approach surface at 5,000 feet from the primary surface is 2,000 feet.

RUNWAY PROTECTION ZONES PLANS

The *Runway Protection Zones Plans*, **Sheet No. 4**, consists of a large scale plan and profile view of the inner portions of the approach surfaces. This plan is designed to facilitate identification of roadways, levees, utility lines, structures, and other possible obstructions that may lie within these safety areas at the ends of each runway.

The runway protection zone (RPZ) dimensions are a function of the size of the aircraft and the runway instrumentation. The existing RPZs are sized for small aircraft utilizing visual approach capabilities (250 feet by 1,000 feet by 450 feet). Ultimately, the airport will support non-precision approaches, however, the RPZ sizes will remain the same. Although RPZs would generally be kept graded and level, the RPZ for Runway 12 at Half Moon Bay Airport contains a small portion of a roadway. This roadway within the RPZ's is considered an obstruction, therefore, no additional notification or marking is necessary.

ON-AIRPORT LAND USE/NOISE PLAN

The objective of the *On-Airport Land Use/Noise Plan*, **Sheet No. 5**, is to

locate land uses within the airport boundaries so that they are compatible and able to function without major constraints or annoyance.

Three major categories of land uses are depicted on the *On-Airport Land Use/Noise Plan*: Airfield, Aviation Related Revenue Support and Non-Aviation Related Revenue Support. The Airfield land use category refers to the runway and taxiway systems, as well as portions of the RPZs. The Aviation Related Revenue Support land use category reserves space for aprons, terminal facilities, FBO facilities, hangars, etc. The Non-Aviation Related Revenue Support land use category refers to those areas which support commercial/industrial tenants that do not require access to the runway/taxiway system. Some of these parcels are currenly being leased for agricultural purposes and an automobile parking lot. Those parcels located within residential areas should be used for agriculture or possible for additional "bed and breakfest" facilities.

As indicated on the *On-Airport Land Use/Noise Plan*, the approximate size of the Airfield, Aviation Related Revenue Support and Non-Aviation Related Revenue Support categories are approximately 179 acres, 125 acres and 16 acres, respectively.

In addition to land uses, the *On-Airport Land Use/Noise Plan* illustrates the 1995 and 2015 noise contours. Noise levels anticipated by aircraft operations in 1995 and 2015 have been determined through the use of the Integrated Noise Model (INM) version No. 5. This is the latest computer modeling tool which predicts noise exposure levels generated by aircraft operations over a 24-hour period. In general, the FAA recommends that residential and other noise sensitive land uses not be constructed within the 65 Community Noise Equivalent Level (CNEL) contour area.

The 1995 and 2015 operational levels and aircraft types were compiled and entered into the INM to generate the resulting CNEL noise contours. As shown, the 65 CNEL noise exposure level for Half Moon Bay Airport is generally contained within the airport's boundary. Both the 1995 and 2015 noise contours include a portion of property outside of the southern property boundary of the airport within the 65 CNEL. It appears that a few residential or noise sensitive land uses are within both the 1995 and 2015 65 CNEL contour.

The *On-Airport Land Use/Noise Plan* is designed to provide basic guidance for the County in making decisions related to on-airport development at Half Moon Bay Airport, as well as to provide the general noise exposure levels anticipated in 1995 and the year 2015.

AIRPORT PROPERTY MAP

The *Airport Property Map*, **Sheet No. 6,** depicts the property that was acquired in order to construct Half Moon Bay Airport, along with the proposed/ potential land acquisition during the 20-year planning period. The documents recording the land acquisitions are de-

scribed. It is recommended that a survey and title search be conducted to accurately determine the airport property line.

SUMMARY

The Airport Plans Set is designed to provide basic guidance for the County in making decisions relative to future development at Half Moon Bay Airport. The Airport Plan Set provides for development to satisfy both short-term and long-range needs. Flexibility will be a key to the future development, since demands may not occur exactly as forecast.

It is prudent for the County to ensure that these plans remain current and that the appropriate authorities be advised whenever significant changes in airport development occur that could affect area land use planning.

AIRPORT MASTER PLAN

HALF MOON BAY AIRPORT

SAN MATEO COUNTY, CALIFORNIA

AIRPORT LAYOUT PLANS
INDEX OF DRAWINGS

AIP #3-06-0210-05

Coffman Associates
Airport Consultants

AIRPORT DATA

HALF MOON BAY AIRPORT (HAF)

CITY: HALF MOON BAY		COUNTY: SAN MATEO, CALIFORNIA	
RANGE: R 6W	TOWNSHIP: T 5S	CIVIL TOWNSHIP: N/A	
		EXISTING	ULTIMATE
AIRPORT SERVICE LEVEL		GENERAL AVIATION	SAME
AIRPORT REFERENCE CODE		B-II	SAME
AIRPORT ELEVATION		67.3' MSL	SAME
MEAN MAXIMUM TEMPERATURE OF HOTTEST MONTH		62°F (July)	SAME
AIRPORT REFERENCE POINT (ARP) COORDINATES (NAD 83)	Latitude	N37°30'49.800"	SAME
	Longitude	W122°30'4.200"	SAME
AIRPORT and TERMINAL NAVIGATIONAL AIDS		ROTATING BEACON --- --- ---	ROTATING BEACON ASOS --- ---

RUNWAY END COORDINATES (NAD 83)		EXISTING	ULTIMATE
RUNWAY 12	Latitude	N37°31'2.2858"	N37°31'7.7906"
	Longitude	W122°30'18.9958"	W122°30'25.4747"
RUNWAY 30	Latitude	N37°30'37.2801"	N37°30'31.8117"
	Longitude	W122°29'49.3593"	W122°29'42.9223"

RUNWAY DATA

RUNWAY DATA	RUNWAY 12-30 EXISTING	RUNWAY 12-30 ULTIMATE
AIRPORT REFERENCE CODE	B-II	SAME
RUNWAY AZIMUTH	318.000	SAME
RUNWAY BEARING	N42°W	SAME
RUNWAY DIMENSIONS	5000' X 150'	SAME
APPROACH VISIBILITY MINIMUMS	≥ 1 MILE/≥ 1 MILE	SAME
RUNWAY INSTRUMENTATION	VISUAL/VISUAL	NONPREC./NONPREC.
RUNWAY APPROACH SURFACES	20:1/20:1	SAME
RUNWAY THRESHOLD DISPLACEMENT	763'/763'	NONE
RUNWAY STOPWAY	NONE	SAME
RUNWAY SAFETY AREA	5600' X 150'	SAME
RUNWAY OBSTACLE FREE ZONE	5400' X 400'	SAME
RUNWAY OBJECT FREE AREA	5600' X 500'	SAME
TAKEOFF RUN AVAILABLE (TORA)	5000'/5000'	SAME
TAKEOFF DISTANCE AVAILABLE (TODA)	5000'/5000'	SAME
ACCELERATE-STOP DISTANCE AVAILABLE (ASDA)	5000'/5000'	SAME
LANDING DISTANCE AVAILABLE (LDA)	4232'/4232'	5000'/5000'
PAVEMENT MATERIAL	ASPHALT	SAME
PAVEMENT SURFACE TREATMENT	NONE	SAME
PAVEMENT STRENGTH (in thousand lbs.)	12.5(S)	SAME
RUNWAY EFFECTIVE GRADIENT (in %)	0.07	SAME
RUNWAY MARKING	VISUAL/VISUAL	NONPREC./NONPREC.
RUNWAY LIGHTING	MIRL	SAME
RUNWAY APPROACH LIGHTING	NONE	SAME
TAXIWAY LIGHTING	MITL	SAME
TAXIWAY MARKING	CENTERLINE	SAME
NAVIGATIONAL AIDS	VASI (30) REIL (30) --- --- ---	GPS (BOTH) PAPI-2 (BOTH) REIL (BOTH) --- ---

*Pavement strengths are expressed in Single(S) wheel loading capacities.

DEVIATIONS FROM FAA AIRPORT DESIGN STANDARDS

DEVIATION DESCRIPTION	EFFECTED DESIGN STANDARD	STANDARD	EXISTING	PROPOSED DISPOSITION
Obstructions	F.A.R. Part 77	See Sheet 3	See Sheet 3	See Sheet 3

LEGEND

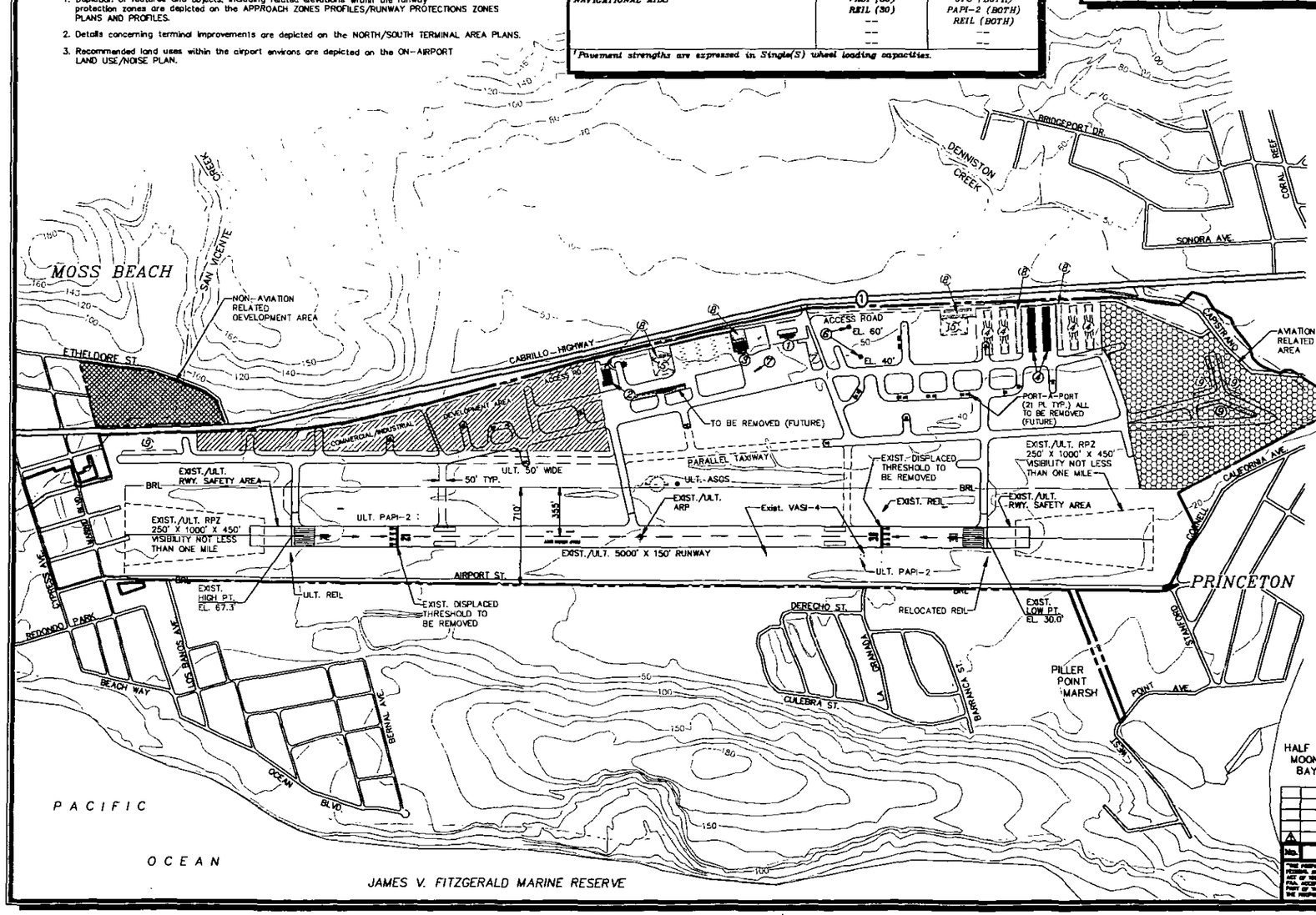
EXISTING	ULTIMATE	DESCRIPTION
		AIRPORT PROPERTY LINE
		AIRPORT REFERENCE POINT (ARP)
		AIRPORT ROTATING BEACON
		AVIGATION EASEMENT (if appicable)
		BUILDING CONSTRUCTION
	BRL	BUILDING RESTRICTION LINE (BRL)
		DRAINAGE
		FACILITY CONSTRUCTION
		FENCING
VASI-4	PAPI-4	NAVIGATIONAL AID INSTALLATION
		RUNWAY END IDENTIFICATION LIGHTS (REIL)
		RUNWAY THRESHOLD LIGHTS
		SEGMENTED CIRCLE/WIND INDICATOR
		SECTION CORNER
		TOPOGRAPHIC CONTOURS (source)
		WIND INDICATOR (Lighted)

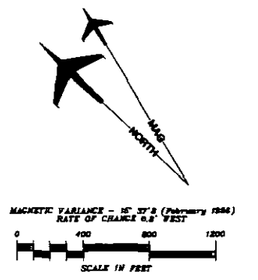
BUILDINGS/FACILITIES

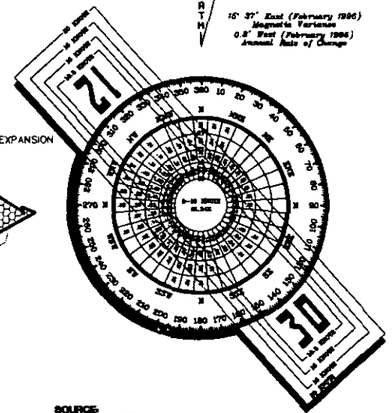
EXISTING	ULTIMATE	DESCRIPTION
1	---	ADMINISTRATION/TERMINAL BUILDING
2	---	FIXED BASE OPERATION HANGAR (Half Moon Bay Aero)
3	---	FIXED BASE OPERATION HANGAR (West Coast Aviation Co.)
4	4	T-HANGAR
---	5	CONVENTIONAL HANGAR
6	---	MICROWAVE TOWER
7	7	FUEL STORAGE FACILITY (Existing Underground) (Ultimate Aboveground)
---	8	AUTO PARKING
9	9	RECREATIONAL AIRCRAFT PARKING

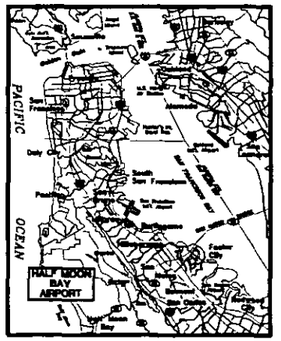
GENERAL NOTES

1. Depiction of features and objects, including related elevations within the runway protection zones are depicted on the APPROACH ZONES PROFILES/RUNWAY PROTECTIONS ZONES PLANS AND PROFILES.
2. Details concerning terminal improvements are depicted on the NORTH/SOUTH TERMINAL AREA PLANS.
3. Recommended land uses within the airport environs are depicted on the ON-AIRPORT LAND USE/NOISE PLAN.









LOCATION MAP
NOT TO SCALE

SOURCE:
NOAA National Climatic Center
Asheville, North Carolina
San Francisco International Airport
San Francisco, California

OBSERVATIONS
TOLLEY AB Weather Observations
4,258 JFB CAT-1 Observations
1987 - 1994

ALL WEATHER WIND COVERAGE

Runways	10.8 Knots	13 Knots	16 Knots	20 Knots
Runway 12-30	89.45%	94.54%	98.06%	99.48%

ALL WEATHER WINDROSE

SUBMITTED BY: Coffman Associates — ON THE DATE OF:
FOR APPROVAL BY:
APPROVED BY: — ON THE DATE OF:
Gary Petersen
Airport Manager

No.	REVISIONS	DATE	BY	APPD.
	-	-	-	-

THE REPRODUCTION OF THESE DOCUMENTS WAS FINANCED IN PART THROUGH A FEDERAL GRANT FROM THE FEDERAL AVIATION ADMINISTRATION AS PROVIDED UNDER SECTION 16 OF THE FEDERAL AVIATION ACT OF 1958. ANY REPRODUCTION OF THESE DOCUMENTS MUST INCLUDE A STATEMENT TO THE EFFECT THAT THE REPRODUCTION WAS FINANCED IN PART BY THE FEDERAL GOVERNMENT AND THAT THE REPRODUCTION DOES NOT CONSTITUTE A GUARANTEE BY THE FEDERAL GOVERNMENT OF THE DATA CONTAINED HEREIN. THE USER OF THESE DOCUMENTS IS RESPONSIBLE FOR DETERMINING THAT THEY ARE SUITABLE FOR HIS INTENDED USE AND THAT HIS USE OF THE INFORMATION IS APPROPRIATE AND CORRECT. THE FEDERAL GOVERNMENT IS ASSUMES NO RESPONSIBILITY WHATSOEVER IN CONNECTION WITH ANY SUCH USE BY THE USER OR ANY OTHER PARTY. THE FEDERAL GOVERNMENT IS NOT RESPONSIBLE FOR, AND DOES NOT ENDORSE, ANY PRODUCT OR SERVICE RESULTING FROM THE USE OF THESE DOCUMENTS. THE USER AGREES TO INDEMNIFY AND HOLD HARMLESS THE FEDERAL GOVERNMENT, ITS AGENTS, AND EMPLOYEES FROM ANY CLAIM, LOSS, OR LIABILITY ARISING OUT OF OR IN CONNECTION WITH THE USE OF THESE DOCUMENTS.

HALF MOON BAY AIRPORT

AIRPORT LAYOUT PLAN

SAN MATEO COUNTY, CALIFORNIA

PLANNED BY: Hall S. Bragg/Kathryn W. Ang
DETAILED BY: W.S. Holland
APPROVED BY: James R. Harris, P.E.
January 22, 1997 — SHEET 1 OF 6

Coffman Associates — Airport Consultants

MATCHLINE - SEE NORTH TERMINAL AREA PLAN (BELOW)

SONORA AVE.

CABRILLO HIGHWAY

ACCESS ROAD

EL. 60'

EL. 40'

CAPISTRANO

AVIATION RELATED EXPANSION AREA

ACCESS ROAD

COMMERCIAL/INDUSTRIAL DEVELOPMENT AREA

TO BE REMOVED (FUTURE)

PORT-A-PORT (21 PL TYP.) ALL TO BE REMOVED (FUTURE)

ULT. 50' WIDE PARALLEL TAXIWAY

ULT. ASOS

BRL

CALIFORNIA AVE.

EXIST./ULT. 5000' X 150' RUNWAY

21

30

MAG. NORTH

MAGNETIC VARIANCE - 15° 37' E (February 1996)
RATE OF CHANGE 0.8° WEST

0 200 400 800
SCALE IN FEET

NON-AVIATION CORRELATED DEVELOPMENT AREA

ACCESS ROAD

COMMERCIAL/INDUSTRIAL DEVELOPMENT AREA

ULT. 50' WIDE PARALLEL TAXIWAY

BRL

50' TYP.

EXIST./ULT. RPZ
250' X 1000' X 450'
VISIBILITY NOT LESS THAN ONE MILE

EXIST./ULT. 5000' X 150' RUNWAY

MARINE BLVD.

AIRPORT ST.

CYPRESS AVE.

REDONDO PARK

BEACH WAY

MATCHLINE - SEE SOUTH TERMINAL AREA PLAN (ABOVE)

DERECHO ST.

LEGEND

EXISTING	ULTIMATE	DESCRIPTION
		AIRPORT PROPERTY LINE
		AIRPORT REFERENCE POINT (ARP)
		AIRPORT ROTATING BEACON
		AVIGATION EASEMENT (if applicable)
		BUILDING CONSTRUCTION
	BRL	BUILDING RESTRUCTION LINE (BRL)
		DRAINAGE
		FACILITY CONSTRUCTION
		FENCING
		NAVIGATIONAL AID INSTALLATION
		RUNWAY END IDENTIFICATION LIGHTS (REIL)
		RUNWAY THRESHOLD LIGHTS
		SEGMENTED CIRCLE/WIND INDICATOR
		SECTION CORNER
		TOPOGRAPHIC CONTOURS (source)
		WIND INDICATOR (Lighted)

BUILDINGS/FACILITIES

EXISTING	ULTIMATE	DESCRIPTION
1	---	ADMINISTRATION/TERMINAL BUILDING
2	---	FIXED BASE OPERATION HANGAR (Half Moon Bay Aero)
3	---	FIXED BASE OPERATION HANGAR (West Coast Aviation Co.)
4	4	T-HANGAR
---	5	CONVENTIONAL HANGAR
6	---	MICROWAVE TOWER
7	7	FUEL STORAGE FACILITY (Existing - Underground) (Ultimate - Aboveground)
---	8	AUTO PARKING
9	9	RECREATIONAL AIRCRAFT PARKING

MAG. NORTH

MAGNETIC VARIANCE - 15° 37' E (February 1996)
RATE OF CHANGE 0.8° WEST

0 200 400 800
SCALE IN FEET

GENERAL NOTES:

1. Depiction of features and objects, including related elevations within the runway protection zones are depicted on the APPROACH ZONES PROFILES/RUNWAY PROTECTION ZONES PLANS AND PROFILES.
2. Recommended land uses within the airport environs are depicted on the ON-AIRPORT LAND USE/NOISE PLAN.

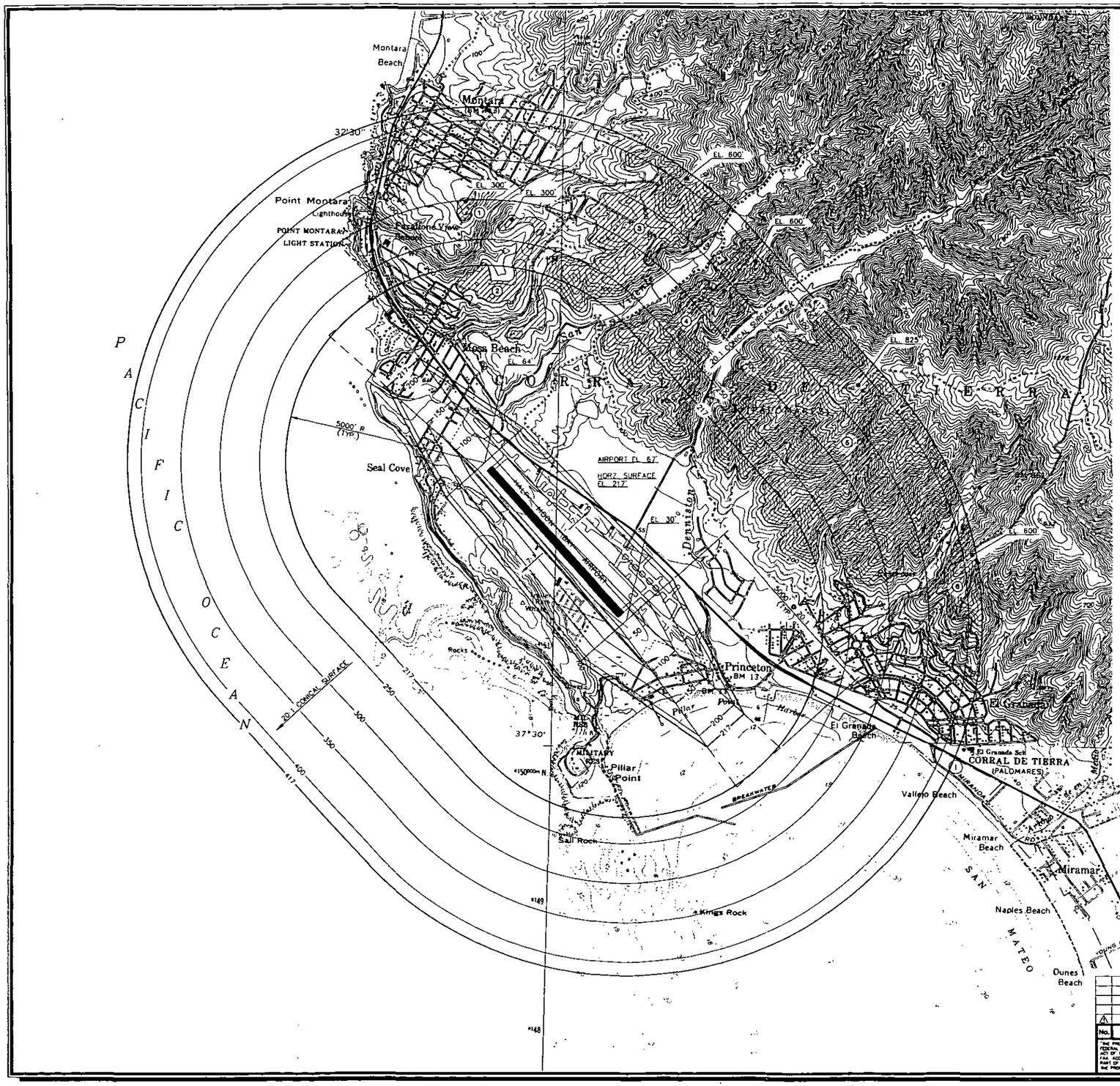
No.	REVISIONS	DATE	BY	APP'D.

"THE PREPARATION OF THESE DOCUMENTS WAS FINANCED IN PART THROUGH A PLANNING GRANT FROM THE FEDERAL AVIATION ADMINISTRATION AS PROVIDED UNDER SECTION 505 OF THE AIRPORT AND AIRWAY IMPROVEMENT ACT OF 1982, AS AMENDED. THE CONTENTS DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THESE DOCUMENTS BY THE FAA DOES NOT & ANY NOT 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."

HALF MOON BAY AIRPORT
NORTH/SOUTH TERMINAL AREA PLANS
SAN MATEO COUNTY, CALIFORNIA

PLANNED BY: Jack S. Gray/Kathryn W. Gray
DETAILED BY: W.R. Holland
APPROVED BY: James M. Haverly, P.E.
January 22, 1997 SHEET 2 OF 6

Coffman Associates
Airport Consultants



OBSTRUCTION TABLE

Object Description	Object Elevation	Obstructed Part 77 Surface	Surface Elevation	Object Penetration	Proposed Object Disposition
① Terrain	Varies 275' to 300'	Conical	Varies	Varies	
② Terrain	Varies 217' to 300'	Conical/Horizontal	Varies	Varies	
③ Terrain	Varies 217' to 600'	Conical/Horizontal	Varies	Varies	Request FAA
④ Terrain	Varies 217' to 600'	Conical/Horizontal	Varies	Varies	Aeronautical Study
⑤ Terrain	Varies 217' to 825'	Conical/Horizontal	Varies	Varies	
⑧ Terrain	Varies 350' to 600'	Conical	Varies	Varies	

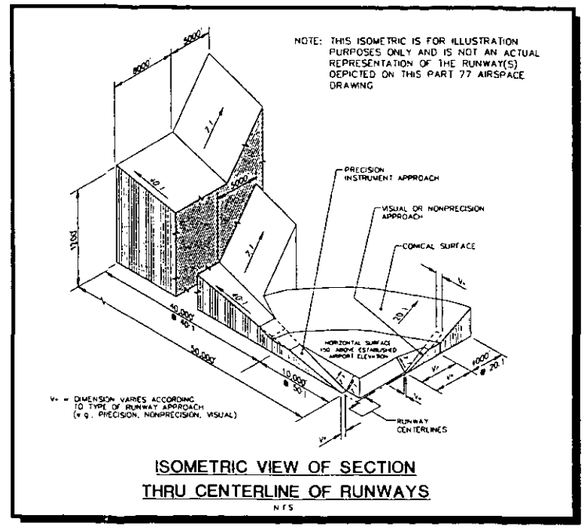
GENERAL NOTES-

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 outer portion of the approach surfaces, is illustrated on the APPROACH ZONES PROFILES, Sheet 4 of these plans
3. Depiction of features and objects within the inner portion of the approach surfaces, is illustrated on the PROTECTION ZONES PLAN, Sheet 4 of these plans
4. Existing and future height and hazard ordinances are to be amended and/or referenced upon approval of updated PART 77 AIRSPACE PLAN

OBSTRUCTION LEGEND

EL 600'
OBSTRUCTION HIGH POINT

(1) GROUP or MULTIPLE OBSTRUCTIONS



ISOMETRIC VIEW OF SECTION
THRU CENTERLINE OF RUNWAYS
NTS

NORTH MAG

MAGNETIC VARIANCE - 15°38' E (May 1995)
RATE OF CHANGE 0.8' WEST

0 1200 2400 3600
SCALE IN FEET

No.	REVISIONS	DATE	BY	APP'D

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

HALF MOON BAY AIRPORT

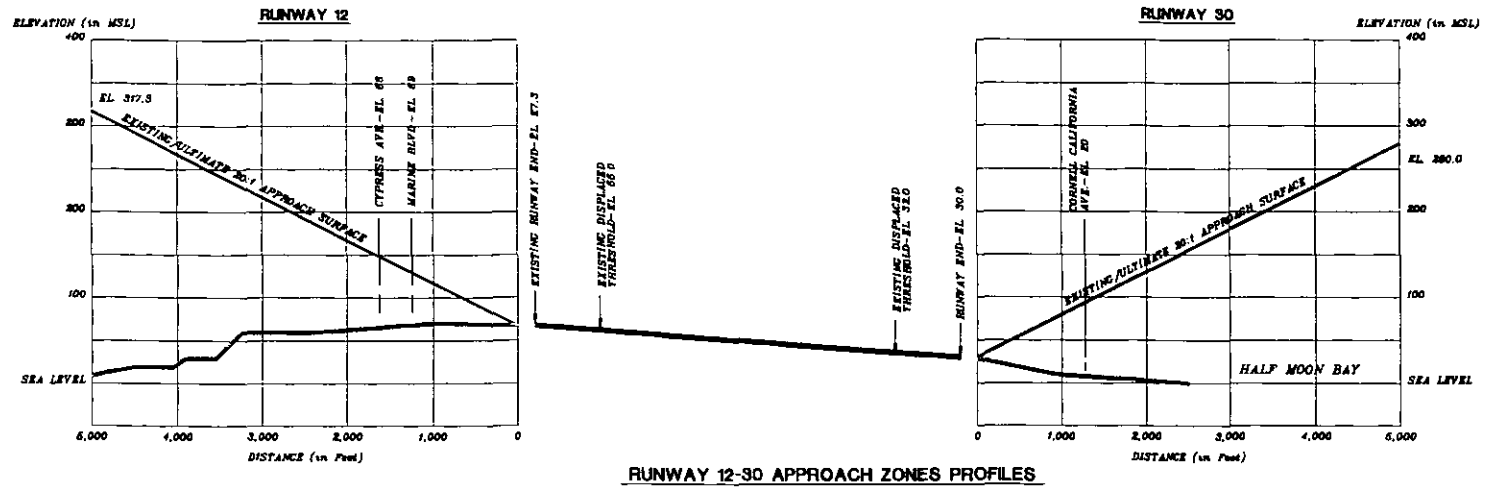
PART 77 AIRSPACE PLAN

SAN MATEO COUNTY, CALIFORNIA

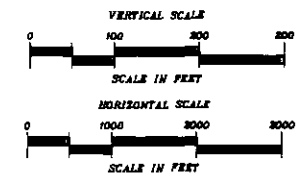
PLANNED BY: Kathryn W. Mayfield & Assoc.
DETAILED BY: W.B. Holland
APPROVED BY: Jeanette D. Hoffman

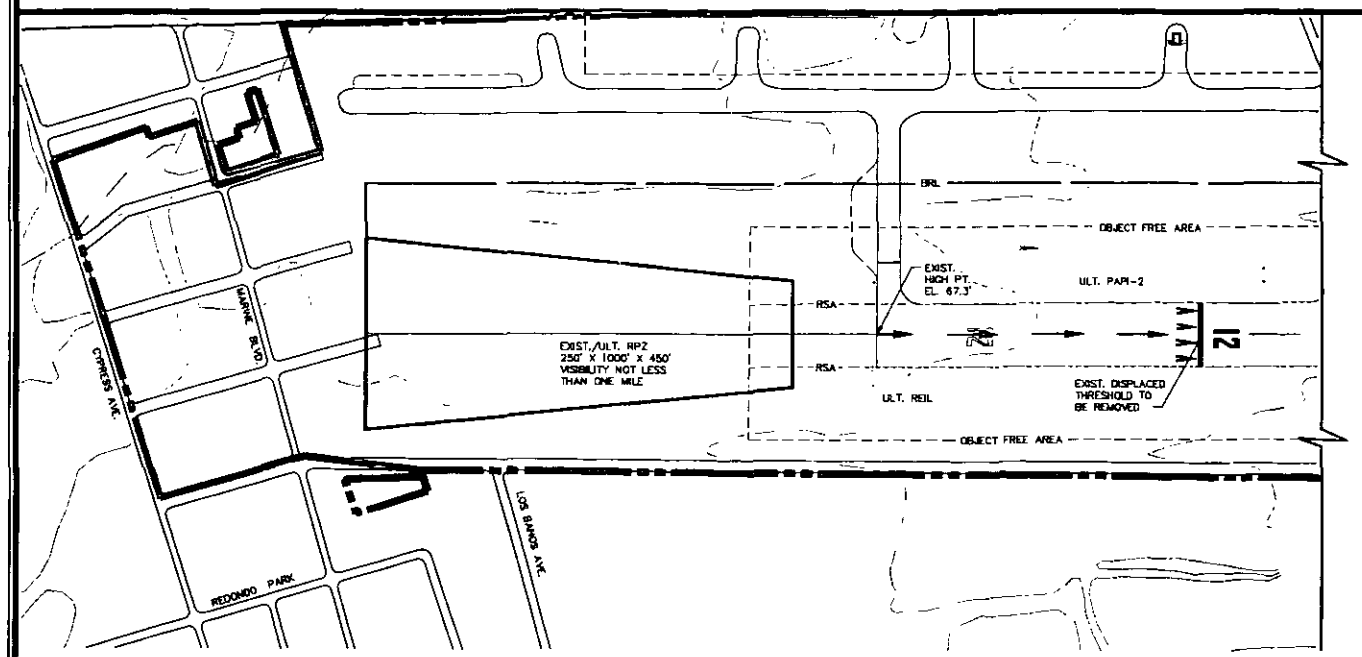
February 16, 1996 | SHEET 3 OF 6

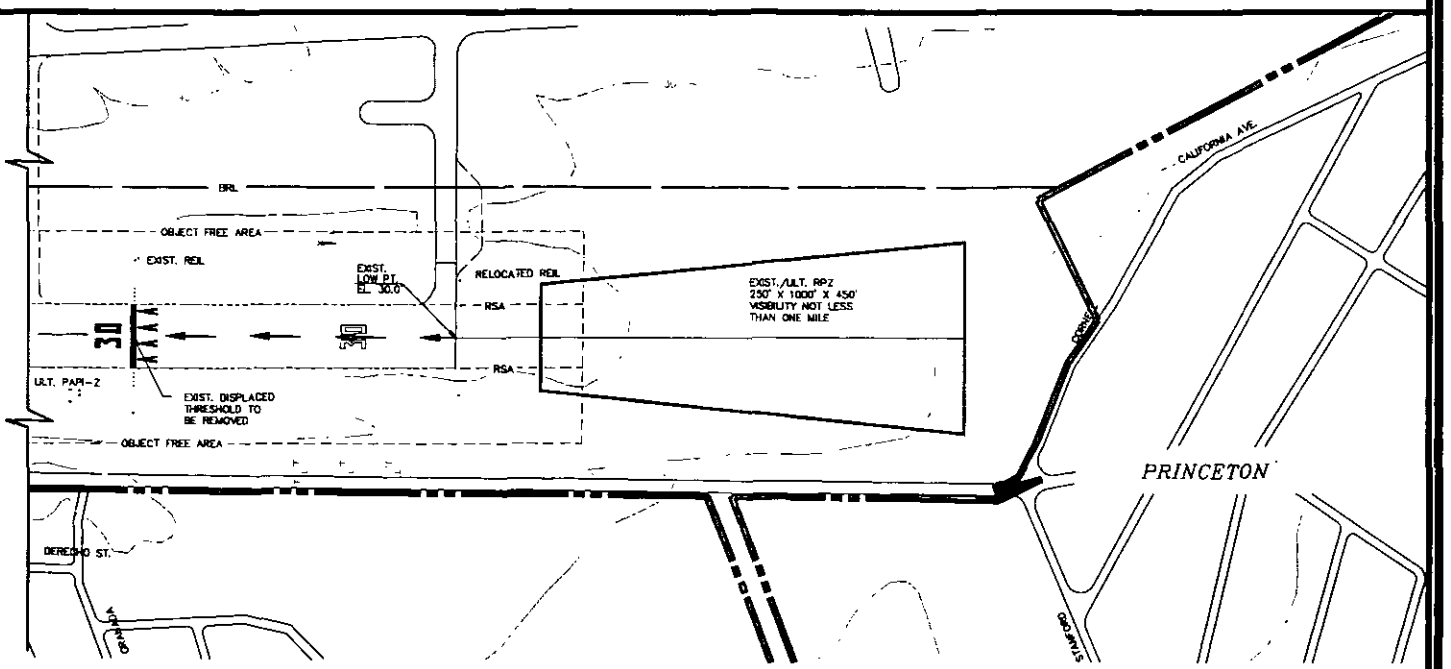
Coffman Associates
Airport Consultants

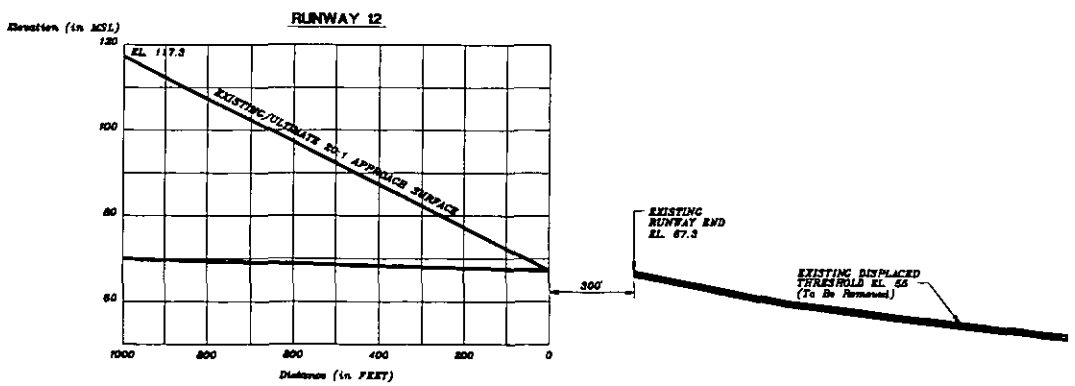


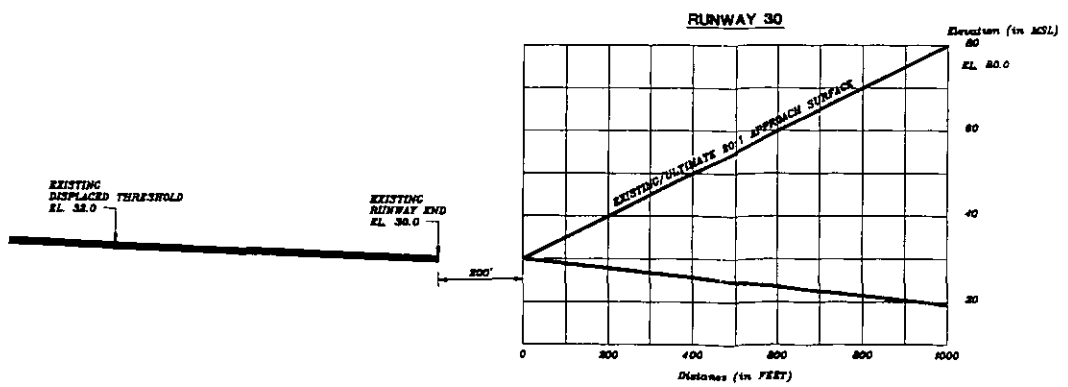
RUNWAY 12-30 APPROACH ZONES PROFILES











RUNWAY 12-30 PROTECTION ZONES PLAN AND PROFILE

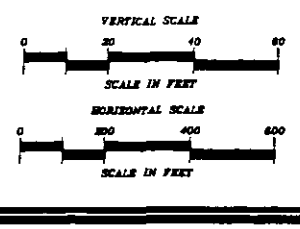
OBSTRUCTION TABLE

Object Description	Object Elevation	Obstructed Part 77 Surface	Surface Elevation	Object Penetration	Proposed Object Disposition
NONE	–	–	–	–	–

GENERAL NOTES:

1. Obstructions, clearances, and locations are calculated from ultimate runway end elevations and ultimate approach surfaces, unless otherwise noted.
2. Depiction of features and objects within the primary, transitional and horizontal Part 77 surfaces is illustrated on the PART 77 AIRSPACE PLAN, Sheet 3 of these plans.

MAGNETIC VARIANCE – 15°36'E (MARCH 1996)
RATE OF CHANGE 0.6' WEST



No.	REVISIONS	DATE	BY	APPD.
–	–	–	–	–

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

HALF MOON BAY AIRPORT

APPROACH ZONES PROFILES/RUNWAY PROTECTION ZONES PLANS AND PROFILES

SAN MATEO COUNTY, CALIFORNIA

PLANNED BY: Kathryn W. Long/Scott S. Young
DETAILED BY: W.E. Kirkland/K.D. Johnson
APPROVED BY: Preston N. Hamrin, P.E.
January 22, 1997 SHEET 4 OF 6

Coffman Associates
Airport Consultants

Coffman Associates 947-A2F.DGN 01-22-1997 11:19

LEGEND

- EXISTING AIRPORT PROPERTY LINE
- 55 CNEL CONTOUR – 1986
- 55 CNEL CONTOUR – 2015

ON-AIRPORT LAND USE LEGEND

- AIRFIELD OPERATIONS (182 ACRES)
- AVIATION RELATED REVENUE SUPPORT (131 ACRES)
- NON-AVIATION REVENUE SUPPORT (20 ACRES)

MOSS BEACH

PRINCETON

HALF MOON BAY

PACIFIC OCEAN

JAMES V. FITZGERALD MARINE RESERVE

DENNISTON CREEK

SAN VICENTE CREEK

BRIDGEPORT DR.

CORAL REEF

SONORA AVE.

ACCESS ROAD

CABRILLO HIGHWAY

CAPISTRANO

CALIFORNIA AVE.

AEROPARK WAY

ETHEL DORE ST.

LANCASTER BLVD.

CYPRESS AVE.

BEACH ST.

SPRING ST.

BEACH WAY

REDONDO PARK

CORONADOS AVE.

BRUCE AVE.

OCEAN BLVD.

AIRPORT ST.

COLEBRA ST.

ARENOSA ST.

PILLAR POINT MARSH

POINT AVE.

STANFORD

55 55 60 60 65 70 75 75 70 65 60 60 55 55

MAG. NORTH

0 400 800 1200

SCALE IN FEET

No.	REVISIONS	DATE	BY	APP'D

HALF MOON BAY AIRPORT

ON-AIRPORT LAND USE/ NOISE PLAN

SAN MATEO COUNTY, CALIFORNIA

PLANNED BY: Hoth S. Young/Kathryn W. Young

DETAILED BY: W.E. Holland

APPROVED BY: Thomas A. Horan, P.E.

January 22, 1997 | SHEET 5 OF 6

Gillmann Associates
Airport Consultants

DEED REFERENCE
HALF MOON BAY AIRPORT

No.	Grantor	Volume and Page	Date Recorded	Description
1	U.S.A.	2961 O.R. 534	1/18/1957	Lots 8-17 Blk. 70 Morton Manor Sur. 8/38
2	Hammon	4286 O.R. 888	8/8/1963	Lots 1 & 2 Blk. 35
3	Tippet	4138 O.R. 169	1/4/1962	Lots 3,4
4	Blanchard	4278 O.R. 106	8/27/1962	Lots 3,8,8,11,10
5	Torres	4440 O.R. 336	3/13/1963	Lots 7,8
6	Mitchell	4388 O.R. 888	1/16/1963	Lots 6,10
7	Hoover	4178 O.R. 168	4/3/1962	Lot 17
8	Coastside Nursery, Inc.	4027 O.R. 573	10/28/1964	Lots 10,10,22,24
9	Coastside Nursery, Inc. et al	4883 O.R. 477	8/24/1963	Lot 20
10	Jay	4821 O.R. 88	8/8/1963	Lot 21
11	Crouse	4342 O.R. 888	12/4/1962	Lot 38
12	Lasky	4284 O.R. 477	7/30/1963	Lot 20
13	Coastside Nursery, Inc.	4388 O.R. 218	2/11/1963	Lots 1,3,5,16,15,19 Blk. 33
14	Flansburg	4423 O.R. 888	3/28/1967	Lot 3
15	Baker	4383 O.R. 88	8/28/1963	Lot 8
16	Swanson et al	4278 O.R. 273	8/24/1962	Lots 7,8
17	Hynard & Kiger	4435 O.R. 367	4/16/1963	Lot 8
18	Gallagher	4388 O.R. 478	7/30/1963	Lot 10
19	Clements	4338 O.R. 289	11/19/1963	Lots 11,12
20	Pebble	4348 O.R. 334	11/28/1962	Lots 13, 14
21	Wing	4088 O.R. 388	8/14/1961	Lot 16
22	Bent	4178 O.R. 168	4/3/1962	Lot 17
23	Bent	4383 O.R. 88	8/28/1963	Lots 20,21
24	Chappell	4388 O.R. 173	1/7/1957	Lot 23
25	Estate of Maude Allison	4818 O.R. 84	12/30/1963	Lot 4
26	Hammon & Boyle	4838 O.R. 348	8/14/1963	Lots 1-3 & Ptn. 4 NE-ly 30' Blk. 35
27	Mansfield	4438 O.R. 543	4/8/1963	Lots 5,7 & S Ptn. 4 SW-ly 5'
28	Woodruff	4387 O.R. 873	10/8/1963	Lot 8
29	Grossworth	4338 O.R. 289	11/19/1963	Lots 10,11
30	Hall	4333 O.R. 288	9/28/1962	Lot 12
31	Sargent	4307 O.R. 873	9/16/1963	Lot 13
32	Coastside Nursery, Inc.	4088 O.R. 418	11/28/1963	Lots 14-17
33	Patterson	4388 O.R. 184	8/1/1962	Lots 18,19
34	Foley - Adams,	4342 O.R. 338	11/28/1962	Lots 20,21
35	Coastside Nursery, Inc.	4878 O.R. 184	10/28/1963	Lots 22,23
36	Manhoff	4838 O.R. 344	3/16/1967	Lots 24, 25
37	Livingston	4307 O.R. 374	3/16/1966	Lot 26
38	Coastside Nursery, Inc.	4388 O.R. 218	2/11/1963	Lot 1 Blk. 21
39	Grossworth	4338 O.R. 289	11/16/1963	Lot 1
40	Garfinkel	4341 O.R. 71	11/28/1962	Lots 3,4
41	Coastside Nursery, Inc.	4878 O.R. 188	10/28/1963	Lot 8
42	Glenn	4318 O.R. 481	10/24/1962	Lots 6-8
43	Bettencourt	4374 O.R. 888	1/21/1966	Lots 6,16
44	Cosmos	4307 O.R. 376	3/16/1966	Lot 11
45	Pepe et al	4388 O.R. 138	1/7/1962	Lots 13,14
46	Lohr	4388 O.R. 388	2/14/1963	Lots 16-17
47	Gottsdiener	4307 O.R. 368	3/16/1966	Lot 18
48	Hammon	4834 O.R. 537	4/16/1968	Lot 19
49	Hynard & Kiger	4438 O.R. 367	4/16/1963	Lot 20
50	Allen	4330 O.R. 888	8/19/1962	Lots 1-4 Blk. 18
51	Coastside Nursery, Inc.	4388 O.R. 218	2/11/1963	Lots 5,6,14-17,22
52	Jensen - Adams, - Smith	4818 O.R. 88	12/28/1963	Lots 7,8
53	Williamson	4342 O.R. 338	11/28/1962	Lot 8
54	Eckberg	4333 O.R. 287	8/22/1962	Lots 10,11
55	Pack Jr.	4178 O.R. 173	4/3/1962	Lots 12,13
56	Bishop	4287 O.R. 388	7/28/1963	Lots 19-21
57	Jensen - Adams, - Lloyd	4818 O.R. 38	12/28/1962	Lot 38
58	French	4284 O.R. 478	7/29/1963	Lot 24
59	Hynard & Kiger	4438 O.R. 367	4/16/1963	Lot 28
60	Quicksilver	4178 O.R. 163	4/2/1962	Lot 1 Blk. 18
61	Griffith	4307 O.R. 376	3/16/1966	Lots 2-8
62	Coastside Nursery, Inc.	4388 O.R. 218	2/11/1963	Lots 8,7,12,13
63	Chevner & Ewell	4177 O.R. 384	4/2/1962	Lot 6
64	Peterson	4886 O.R. 38	8/28/1962	Lots 8-11
65	Bennett	4317 O.R. 388	10/23/1962	Lots 14-15
66	Shattuck	4383 O.R. 138	8/28/1963	Lot 16
67	Olmos	4307 O.R. 888	3/16/1966	Lot 18
68	Hynard & Kiger	4438 O.R. 367	4/16/1963	Lots 17,18
69	Jensen - Adams, - Hammon	4872 O.R. 738	8/16/1968	Lot 20
70	Andrews	4838 O.R. 537	8/27/1962	Lots 21,22
71	Nelson	4388 O.R. 317	1/8/1968	Lot 1 Blk. 18
72	Coastside Nursery, Inc.	4388 O.R. 218	2/11/1963	Lot 2
73	Coastside Nursery, Inc.	4827 O.R. 672	10/28/1964	Lot 3
74	Grossworth	4338 O.R. 288	11/16/1963	Lots 6,16-18
75	Bennett	4317 O.R. 381	10/23/1962	Lots 7-14
76	Lilla	4333 O.R. 388	8/22/1962	Lot 10
77	Hammon	4834 O.R. 537	4/16/1968	Lot 23
78	Lucas	4307 O.R. 318	3/28/1963	Lots 24-28
79	Nelson	4388 O.R. 317	1/8/1968	Lot 27
80	Estate of Lots Way Gates	5438 O.R. 484	1/16/1968	Lots 4,8
81	Bishop	4867 O.R. 367	3/11/1974	Lot 21
82	H.M.B. Prop.	4367 O.R. 289	3/11/1974	Lot 20
83	Fox Carbonier S.M. Co.	5878 O.R. 888	12/18/1978	Lot 20 Blk. 17
84	Coastside Nursery, Inc.	4827 O.R. 673	10/28/1964	Lots 8-8,16,14
85	Hammon	4834 O.R. 537	4/16/1968	Lot 8
86	U.S.A.	3161 O.R. 534	1/18/1957	Lots 43,83-88 Blk. 13 Relocation By Doc. No. 4/22
87	Bell	6388 O.R. 106	11/28/1967	Lot 47 Blk. 14
88	Bell	6488 O.R. 445	12/28/1967	Lots 43-46 Blk. 14
89	Title Insurance & Trust	6438 O.R. 135	1/31/1968	Lots 44-62 Blk. 13
90	Title Insurance & Trust	5414 O.R. 628	1/8/1968	Lot 16 Blk. 14

NOTE: SEE REVERSION TO ACREAGE MAP FILED IN BOOK 71 OF MAPS AT PAGE 9, SAN MATEO COUNTY RECORDS, FOR DIMENSIONS.

NOTE: SEE REVERSION TO ACREAGE MAP FILED IN BOOK 71 OF MAPS AT PAGE 10, SAN MATEO COUNTY RECORDS, RES. NO. 41186 AND DEPARTMENT OF PUBLIC WORKS MAP 22/3596 FOR DIMENSIONS.

DEED REFERENCE (Cont.)
HALF MOON BAY AIRPORT

No.	Grantor	Volume and Page	Date Recorded	Description
91		21 O.S.R. 10	6/19/1978	Stanford Ave. (Ptn.) Aband.
92	MacDonald	6767 O.R. 17	8/27/1974	Lots 14-18 Blk. 12
93	Clarke	6738 O.R. 43	11/16/1974	Lot 16
94	Clarke	7746 O.R. 3218	3/25/1978	Lot 26
95	H.M.B. Prop.	7746 O.R. 3236	3/28/1978	Lot 17
96	Caballeros	7747 O.R. 2434	3/28/1978	Lots 8-10
97	Martin	7786 O.R. 1147	6/5/1978	Lot 91
98	Design	7786 O.R. 849	6/28/1978	Lots 6,7,16
99	Hynard & Blair	7787 O.R. 1888	10/11/1978	Lots 11-13
100		38164 16	4/18/1991	Abandon Ptn. California Ave. & Ptn. Stanford Ave.
101	U.S.A.	11231 O.R. 1	5/28/1946	Ptn. Rancho Corral De Tierra (Pulse Harmon)

NOTE: LOTS COVERED BY GRANT NUMBERS 84 THROUGH 99 WERE ACQUIRED BY ROAD DEPARTMENT AND EXCHANGED WITH AIRPORTS FOR PROPERTY OF EQUAL VALUE.

GENERAL NOTES:

1. ALL EXISTING PROPERTY INFORMATION DEPICTED ON THIS MAP IS BASED ON AN UNTITLED AND UNDATED PROPERTY MAP DRAWING PROVIDED BY THE COUNTY OF SAN MATEO. IT IS RECOMMENDED THAT THIS INFORMATION BE CHECKED THROUGH LEGAL DESCRIPTIONS AND/OR FIELD VERIFICATION. THE SCOPE OF THIS DOCUMENT IS FOR PLANNING PURPOSES ONLY.

No.	REVISIONS	DATE	BY	APP'D.

THE PREPARATION OF THESE DOCUMENTS WAS FINANCED IN PART THROUGH A PLANNING GRANT FROM THE FEDERAL AVIATION ADMINISTRATION AS PROVIDED UNDER SECTION 505 OF THE AIRPORT AND AIRWAY DEVELOPMENT ACT OF 1970, AS AMENDED. THE CONTENTS DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THESE DOCUMENTS BY THE FAA DOES NOT IN ANY RESPECT 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.

HALF MOON BAY AIRPORT

AIRPORT PROPERTY MAP

SAN MATEO COUNTY, CALIFORNIA

PLANNED BY: Hall S. Wray/Kathryn W. Ang
DETAILED BY: W.E. Rolland
APPROVED BY: James A. Kerns, P.E.
January 22, 1997 SHEET 6 OF 6

Coffman Associates Airport Consultants

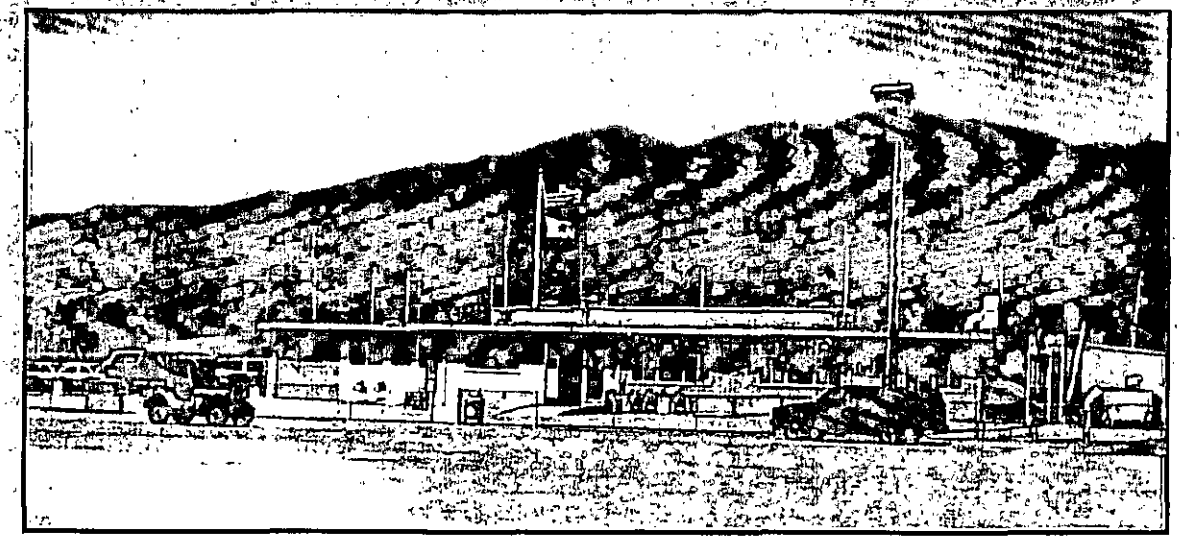
Coffman Associates M:\PROJ\2000 01-23-1997 11:38

SAN MATEO COUNTY
AIRPORTS
HALF MOON BAY

FINANCIAL MANAGEMENT AND DEVELOPMENT PROGRAM

HALF MOON BAY AIRPORT

FINANCIAL MANAGEMENT AND DEVELOPMENT PROGRAM



The analyses conducted in previous chapters have evaluated airport development needs based upon forecast aviation activity, environmental factors, and operational efficiency. One of the most important elements of the master planning process, however, is the application of basic economic, financial, and management rationale so that the feasibility of implementation can be assured. This chapter will concentrate on those factors that will help make the plan successful. A logical development schedule is essential to maintain a realistic and cost effective program for Half Moon Bay Airport.

The program outlined on the following pages has been evaluated from a number of perspectives. The plan is not dependent exclusively upon the County for funding new facilities. In fact, it is quite possible for the County to implement $8,698,400 in improvements at Half Moon Bay Airport over the next twenty years, with continued federal funding.

CAPITAL IMPROVEMENT PROGRAM

Once the specific needs of the airport have been established, the next step is to determine realistic costs for each development item. Day-to-day operating expenses will also be an important factor in determining the amount of funds available for the local share. Development and operating costs will be compared to the potential funds available. A schedule will then be

developed in an attempt to balance the need for each facility and its cost with the projected income sources that can be identified.

This section examines the total cost of each development project and a schedule for the projects. The following sections will examine the revenue sources and expenses of the airport operation. From this evaluation, any shortcomings can be determined and adjustments made to establish a financial program for the airport.

AIRPORT DEVELOPMENT SCHEDULE

In order to better assess the effects of the airport development costs on the overall financial system, the timing or schedule of each development item should be estimated. This evaluation can initially be conducted by dividing the development needs into three stages covering the first five years, the second five years and the final ten year periods, respectively. The first stage includes those items of highest priority to meet immediate and short-term safety and activity needs. The second five-year stage includes those items associated with the redevelopment of the general aviation tiedown and hangar area and to enhance the capacity of the facility. The third, long-term phase, covering the remaining years of the planning period, includes those additional items necessary to maintain the overall operational effectiveness of airport facilities. Of course, each phase should also include basic maintenance and revenue generating components. **Table 6A, Summary of Total Costs,** provides the total cost associated with the 20-year planning period.

TABLE 6A
Summary of Total Costs
Half Moon Bay Airport

Stage I (FY1996-FY2000)	$4,806,300
Stage II (FY2001-FY2005)	$1,322,600
Stage III (FY2006-FY2015)	$2,819,500
TOTAL DEVELOPMENT COST	**$8,948,400**

Prior to summarizing the staged capital costs, two important points should be emphasized. First, the staging of development projects is based upon projected airport activity levels and should be considered in conjunction with Capital Improvement Projects already being contemplated and funded by the County. Secondly, all of the projects will be determined by the actual level of airport activity. Actual activity levels may vary from the projected or forecast levels. Implementation of capital improvement projects should only occur

after the demand has been achieved. The airport development program is based on a fiscal year which coincides with the County's annual financial period. **Table 6B, Capital Improvements Program**, includes a breakdown of the development items during each stage.

Stage I, the first five year period of the development program, has been subdivided into individual fiscal years, FY1996/97 through FY2000/01. The projects in Stage I include the construction of the parallel taxiway, T-hangars, conventional hangars, the installation of PAPIs, MITLs, and REILs, as well as pavement preservation. The total development cost associated with Stage I was estimated at $4,806,300.

Projects identified in the **Stage II** development program encompass the five year period from FY2001/02 through FY2005/06. Stage II development is generally associated with construction of additional auto parking, as well as continued T-hangar development and pavement preservation. The total development cost associated with Stage II was estimated at $1,322,600.

Stage III contains the development items proposed between FY2006/07 and FY2015/16. The projects included in Stage III are generally associated with the continued T-hangar and conventional hangar development, as well as expansion of auto parking. The total development cost associated with Stage III was estimated at $2,819,500

TABLE 6B
Capital Improvement Program
Half Moon Bay Airport

	TOTAL	FAA	STATE	LOCAL	PRIVATE
STAGE I (FY1996-FY2000)					
FY1996/1997					
1. Install ASOS-III	$150,000	$135,000	$6,750	$8,250	$0
2. Install PAPIs	$60,000	$54,000	$2,700	$3,300	$0
3. Install/Relocate REILs	$25,000	$22,500	$1,125	$1,375	$0
4. Runway Markings	$15,000	$13,500	$675	$825	$0
FY1996/1997 Subtotal	$250,000	$225,000	$11,250	$13,750	$0
FY1997/1998					
5. Construct Parallel Taxiways (31,250 SY)	$1,093,800	$984,420	$49,221	$60,159	$0
6. Install MITLs (12,100 LF)	$529,400	$476,460	$23,823	$29,117	$0
FY1997/1998 Subtotal	$1,623,200	$1,460,880	$73,044	$89,276	$0
FY1998/1999					
7. Construct Auto Parking (2,200 SY)	$68,800	$0	$61,920	$6,880	$0
6. Construct T-hangars (30 units)	$750,000	$0	$0	$750,000	$0
9. Construct Taxilanes (9,500 SY)	$297,000	$267,300	$13,365	$16,335	$0
10. Construct Access Road (4,200 SY)	$131,300	$118,170	$5,909	$7,222	$0
FY1998/1999 Subtotal	$1,247,100	$385,470	$81,194	$780,437	$0
FY1999/2000					
11. Pavement Preservation	$500,000	$0	$450,000	$50,000	$0
12. Utility Systems Improvements	$250,000	$225,000	$11,250	$13,750	$0
FY1999/2000 Subtotal	$750,000	$225,000	$461,250	$63,750	$0
FY2000/2001					
13. Construct Conventional Hangar	$900,000	$0	$0	$0	$900,000
14. Install Recreational Tiedowns (1,900SY)	$36,000	$32,400	$1,620	$1,980	$0
FY2000/2001 Subtotal	$936,000	$32,400	$1,620	$1,980	$900,000
STAGE I TOTAL	**$4,806,300**	**$2,328,750**	**$628,358**	**$949,193**	**$900,000**
STAGE II (FY2001/2002-FY2005/2006)					
1. Access Roads (7,000 SY)	$218,800	$196,920	$9,846	$12,034	$0
2. Construct Auto Parking (3,000 SY)	$93,800	$0	$84,420	$9,380	$0
3. Construct Taxilane (3,200 SY)	$100,000	$90,000	$4,500	$5,500	$0
4. Construct T-hangars (15 units)	$375,000	$0	$0	$375,000	$0
5. Install Recreational Tiedowns (1,400 SY)	$35,000	$31,500	$1,575	$1,925	
6. Pavement Preservation	$500,000	$0	$450,000	$50,000	$0
STAGE II TOTAL	**$1,322,600**	**$318,420**	**$550,341**	**$453,839**	**$0**
STAGE III TOTAL (FY2006/2007-FY2015/2016)					
1. Construct Taxilane (1,600 SY)	$50,000	$45,000	$2,250	$2,750	$0
2. Construct T-hangars (15 units)	$375,000	$0	$0	$375,000	$0
3. Construct Conventional Hangar	$1,200,000	$0	$0	$0	$1,200,000
4. Access Road (3,400 SY)	$106,300	$95,670	$4,784	$5,847	$0
5. Construct Auto Parking (1,700 SY)	$53,200	$0	$47,880	$5,320	$0
6. Install Recreational Tiedowns (1,400 SY)	$35,000	$31,500	$1,575	$1,925	$0
7. Pavement Preservation	$1,000,000	$0	$900,000	$100,000	$0
STAGE III TOTAL	**$2,819,500**	**$172,170**	**$956,489**	**$490,842**	**$1,200,000**
TOTAL COSTS (FY1996/1997-FY2015/2016)	**$8,948,400**	**$2,819,340**	**$2,135,187**	**$1,893,873**	**$2,100,000**

AIRPORT DEVELOPMENT COST SUMMARY

The listing of projects under each stage in the development program, as outlined in **Table 6B**, represents the basic budget factors and priority assignments for the airport development through the planning period. Although development items have been numbered, this should not be construed to indicate actual development priority. The construction of any development item should be based on the current demand at that time.

Cost estimates were developed from information provided by construction industry sources as well as a review of actual costs on similar airport projects. This information was applied to pavement, earthwork, and building size requirements for Half Moon Bay Airport to determine the estimated construction costs. A 25 percent contingency for engineering, legal fees, and unforseen costs are included in the estimates. Private funding, funding from businesses or entities operating or wanting to operate at the airport, is indicated for projects such as FBO facilities and conventional hangars.

In future years, the cost shown in **Table 6B** will need to be adjusted for inflation. This may be accomplished by converting the interim change in the United States Consumer Price Index (USCPI) into a multiplier ratio through the following formula:

$$\frac{X}{Y} = Z\ (Change\ Ratio)$$

X = USCPI in any given year
Y = USCPI in 1996
Z = Change Ratio

Multiplying the change ratio (Z) by any 1996-based cost estimate presented in this study will yield the adjusted dollar amounts appropriate in any future year. The local or state CPI may be used since the national CPI may not be representative of this community.

AIRPORT DEVELOPMENT AND FUNDING SOURCES

As previously mentioned, financing for the development and operation of an airport does not typically come from only one funding source. Such is the case with Half Moon Bay Airport, where federal, state, local, and private funding will be necessary during the next 20 years. The primary contributor to the development and operation of the airport will be the aviation community.

FEDERAL AND STATE AID TO AIRPORTS

Airport development and funding in California is accomplished through a cooperative effort involving three levels of government: local, state and federal.

A brief description of the funding sources is provided in the following paragraphs.

Federal Airport Improvement Program

A major funding mechanism that is anticipated to exist throughout the 20-year program, is the Federal Airport Improvement Program (AIP). This program, funded by airport users through user taxes and fees, was recently reauthorized to provide $2.28 billion in FY1997 and $2.347 billion in FY1998.

AIP monies are distributed to airports in two ways: in the form of entitlements (based on actual levels of passenger enplanements), and through discretionary grants. The County is currently only eligible for discretionary grants. In California, Airport projects that meet the FAA's discretionary funds eligibility requirements, could receive 90 percent of the project cost from the AIP.

The funding level authorized in the legislation, however, are not always the levels appropriated in the annual Congressional budget process. For example, the AIP authorized level for FY1997 is $2.28 billion, but only $1.46 billion has been appropriated. When the appropriation level is too low to meet the full entitlement formula, the formula is prorated to the appropriated levels. In FY1996 for example, entitlements were approximately 77 percent of the authorized level. As a result, entitlements are anticipated to be approximately $385,000 rather than $500,000.

As often the case, major capital improvements require funds in excess of the airport's annual entitlement. Additional funds from the discretionary apportionments under the AIP are desirable. The primary feature of AIP discretionary funds that must be recognized is that these funds are distributed on a priority basis. These priorities are established by each FAA regional office based upon the dollar amount of applications received. Since the AIP program funds up to 90 percent of eligible projects, it is essential to most public airport development programs. As a result, the airport will be competing with other airports in California, the FAA Western Pacific Region, as well as the remainder of the country for discretionary funds. Whereas entitlement monies are guaranteed on an annual basis, discretionary funds are not assured.

FAA Facilities and Equipment Program

When activity levels warrant, airports are considered for various FAA installed navigational aids, including Air Traffic Control Towers (ATCT). This is especially true at commercial service airports. Funding for these facilities is normally obtained from the Facilities and Equipment (F&E) section of the FAA. It does not appear that any development items anticipated during this planning period will be eligible for this funding source.

California Aid to Airports

In support of the state aviation 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. As of 1994, tax revenues have been collected and deposited in the Aeronautics Account from the sale of general aviation jet fuel ($0.02 per gallon) and avgas ($0.18 per gallon).

The California Transportation Commission has established three grant programs to distribute funds deposited in the Aeronautics Account: Annual Grants, Acquisition and Development (A&D) Grants, and AIP Matching Grants. Another funding source provided by the CTC is low interest loans. Each item is briefly discussed in the following sections.

Annual Grants

Annual Grants are distributed by the CTC for projects considered "airport and aviation purposes" as defined in the State Aeronautics Act. This grant provides up to $10,000 annually to airports which are not designated as a reliever or commercial service airport. Half Moon Bay Airport is currently designated as a Reliever Airport to San Francisco International Airport, therefore, Half Moon Bay Airport is not eligible to receive an Annual Grant.

Acquisition and Development (A&D) Grant

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. Grant requests are initiated through the CIP process and require a local match of 10 to 50 percent of the projects cost (the level has been 10 percent for the last 10+ years). Unlike Annual Grants, reliever and commercial service 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. Only state eligible projects can be awarded an AIP Matching Grant (projects involved with air carrier improvements are not eligible). This grant provides 4.5 percent of the projects eligible cost (i.e., five percent of the AIP Grant) and counts towards the yearly $500,000 maximum grant dispersement 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 which will benefit the airport and improve self-sufficiency. 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 8 to 15 years for its payback and the interest rate is based upon the most recent State bond sale. San Mateo County could apply for these loans to construct T-hangars at Half Moon Bay Airport.

AIRPORT OPERATING REVENUE AND EXPENDITURES

The County has established an Airport Enterprise Fund accounting system for the fiscal operation of the County's two airports. The FY1991/92 through FY1993/94 actual, FY1994/95 adopted, and FY1995/96 budgeted revenues and expenses associated with the operation of the two County airports are presented in **Table 6C, Airport Enterprise Fund Summary**. Because the County utilizes one Airport Enterprise Fund for the operation of both airports, the following sections will include the revenue, expense, and cash flow for both airports.

TABLE 6C
Airport Enterprise Fund Summary
San Mateo County

	Actuals			Adopted	Budget
	FY1991/92	FY1992/93	FY1993/94	FY1994/95	FY1995/96
REVENUES					
Use of Money and Property	$1,022,441	$951,465	$875,481	$967,000	$1,068,500
Intergovernmental Revenues	$10,000	$32,860	$1,606,449	$1,750,500	$2,131,000
Charges for Services	$47,957	$30,988	$30,966	$25,000	$25,000
Interfund Revenues	$482,861	$563,909	$595,400	$0	$0
Misc. Revenues	$16,163	$13,519	$12,101	$10,000	$10,000
TOTAL REVENUES	**$1,579,422**	**$1,592,741**	**$3,120,397**	**$2,752,500**	**$3,234,500**
EXPENSES					
Salaries and Benefits	$335,893	$344,585	$376,046	$381,668	$515,845
Services and Supplies	$1,136,420	$1,329,787	$2,373,350	$2,891,817	$421,288
Other Charges	$258,669	$175,135	$365,495	$0	$2,467,567
Fixed Assets	$0	$0	$0	$0	$75,000
TOTAL EXPENSES	**$1,730,982**	**$1,849,507**	**$3,114,891**	**$3,273,485**	**$3,479,700**

Source: San Mateo County Airport Administration

The County has recently implemented a new accounting system that provides more detailed breakdowns of the revenues and expenses associated with each airport. Based on the breakdowns of FY 1994/95, San Carlos Airport accounts for approximately 83 percent of the total revenues and 72 percent of the total expenses, while Half Moon Bay Airport accounts for approximately 17 percent of total revenues and 28 percent of total expenses. This breakdown by airport can provide the County with important information when determining the value of certain capital improvements at the two airports. The following description of revenue and expense categories will provide the County with general insight into the Airports Division's future cash flow.

Airport Operation Revenues

Revenue related to the County's Airport Enterprise Fund is anticipated to be derived from seven sources. A brief description of each revenue source is provided in the following sections.

T-hangar

The revenue identified in this category is derived from the lease of T-hangars. This revenue is expected to increase during the planning period with the construction of additional aircraft storage facilities. The fees currently being assessed are escalated by two percent annually throughout the planning period. This revenue source is expected to comprise 53.7 percent of the total Airport Enterprise Fund revenues.

Concessions

The Concessions category includes other rents and concessions that are collected by the County which are not included in the other specific categories. It is expected that concession revenues will account for approximately 8.2 percent of the total Airport Enterprise Fund revenues over the planning period.

Aircraft Tiedowns

Aircraft tiedown fees are collect on a monthly basis from aircraft owners that lease tiedown space at both County airports. The fees currently being assessed are escalated by two percent annually throughout the planning period. This revenue source is expected to account for approximately 19.3 percent of the total Airport Enterprise Fund revenues.

Transient Parking Fees

Transient aircraft are currently assessed a parking fee for over-night use of the airport. Utilizing the forecast transient aircraft activity, revenue from this source was project though the planning period. Approximately 1.2 percent of the total Airport Enterprise Fund revenues are expected to be derived from this source.

Fuel Concessions

Fuel flowage fees are one of the most common revenue sources for public airports. The fee is usually established

on a per-gallon basis and is collected from the fuel concessionaires on the airport. Care must be taken in establishing a reasonable fee that will not discourage aircraft operators from refueling at the airport. The existing FBOs at San Carlos Airport are permitted to sell fuel and are responsible for distributing the fuel to aircraft. The County provides fuel service at Half Moon Bay Airport. Utilizing the forecast fuel sales for the planning period, fuel flowage revenues were projected for the County's two airports. It is expected that fuel flowage revenue will account for approximately 1.9 percent of the total Airport Enterprise Fund revenues over the planning period.

Land and Building Rents

Revenues included in this category include those collected from the leases of County owned land and buildings. The uses of currently leased airport parcels include agricultural and an automobile parking lot associated with the Princeton Inn. Additional revenue could be generated by leasing additional airport parcels for non-aviation related activities. This revenue source includes a two percent escalation annually throughout the planning period. This revenue source is expected to be approximately 14.9 percent of the total airport revenue during the planning period.

Miscellaneous Revenue

Miscellaneous revenues are collect for special events, special use fees, etc. This revenue source is expected to account for less than one percent of the Airport Enterprise Fund total revenues during the planning period.

Airport Operating Expenses

The County is anticipated to accounts for expenses in the following four general categories. Each of these categories are briefly described in the following sections.

Salaries & Benefits

The Salaries & Benefits category includes the personnel expenses of airport related staff. Personnel expenses include an annual two percent increase throughout the planning period. This category is expected to be approximately 44.1 percent of the total Airport Enterprise Fund expenses during the planning period.

Services Fees

Services Fees include those fees associated with contract service provided by non-County employees, as well as services provided by other County departments or divisions (i.e., legal, engineering, purchasing, etc.). It is expected that the Airports Division will continue to utilize other County departments for their expertise during the planning period. This expense category includes a two percent annual increase. This category is expected to comprise approximately 21.6 percent of the Airport Enterprise Fund total expense during the planning period.

Supplies and Equipment

This category includes those office and maintenance supplies and equipment used on a day-to-day basis. This expense includes a two percent annual increase throughout the planning period. This category is expected to consist of approximately 6.7 percent of the total Airport Enterprise Fund expenses.

Indirect Costs

The cost associated with this category include the cost of facilities maintenance, insurance, and utilities. This category is expected to account for approximately 27.6 percent of the total Airport Enterprise Fund expenses during the planning period.

CASH FLOW ANALYSIS

The ideal and ultimate goal of any airport should be to support its own operation through self-generated user fees. Reasonable fees should be established in order to keep the airport competitive with airports in the surrounding area. There is a general tendency to raise rates and fees when income cannot meet the expenses of operation. Caution should be used when considering a rate or fee that is higher than the market condition. Higher fees may result in a short-term revenue increase but can be detrimental in the long-run by discouraging new business and/or causing the relocation of established businesses.

Long-term leases for tenants should contain automatic cost increases. Lease contracts should also contain provisions for the acquisition of any privately constructed buildings or hangars after a reasonable length of time. Lease agreements should allow sufficient time for the private investor to amortize the debt and include incentives for complying with airport rules and procedures.

Table 6D, Cash Flow Analysis, illustrates the revenue/expense projections of the County's Airport Enterprise Fund throughout the planning period. As shown in **Table 6D**, the cost of operating the County's two airports is not expected to exceed the anticipated revenues during the 20-year planning period. In addition, the capital improvement funding requirements are also indicated. Below the Combined CIP Local Shares line item is the anticipated annual payment towards the development of T-hangar/shades at both airports utilizing the State Loan Program. Any net excess revenue is anticipated to be utilized for rehabilitating existing facilities (i.e., terminal building, hangers, etc.) at both airports.

FINANCING THE LOCAL SHARE OF CAPITAL IMPROVEMENTS

The County will need to consider other sources of funding for obtaining the local share of its capital improvement projects. In addition to the revenues derived from airport operations, several other methods are available for financing the local share of airport development costs. The more common methods involve debt financing which amortize

the debt over the useful life of the project or a specified period. Methods of financing available to the County are discussed below.

Revenue Bonds

Revenue Bonds are retired solely from the revenue of a particular project or from the operating income of the issuing agency, such as the County. Generally, they fall outside statutory limitations on public indebtedness and, in many cases, do not require voter approval. Because of the limitations on other public bonds, airport sponsors are increasingly turning to revenue bonds whenever possible.

Revenue Bonds, however, normally carry a higher rate of interest because they lack the security of tax supported General Obligation (GO) bonds issued by other government bodies. Revenue Bonds are more suited to airports that have sufficient cash flow and income to retire the debt in a reasonable time period.

Bank Financing

Some airport sponsors have successfully used bank financing as a means of providing airport development capital. Generally, two conditions are required: the airport must demonstrate the ability to repay the loan at current market rates, and the capital improvement must be less than the value of the present facility. These are standard conditions which are applied to almost all bank loan transactions. This method of financing is particularly useful for smaller development items that will produce revenues and a positive cash flow, and for cases when no private financing is available.

Third-Party Support

Several types of funding would be classified as third-party support. For example, individuals or interested organizations may contribute portions of the required development funds. Private donations are not a common means of airport financing; however, the private financial contributions not only increase the financial support of the project, but also stimulate tenant and community support to airport development.

A slightly more common method of third party support involves permitting the Fixed Based Operators (FBOs) to construct their own hangar and maintenance facilities on property leased from the airport. The advantage to the airport in this type of an arrangement is that it lowers the local share of development costs, a large portion of which is building construction. The advantage to the FBO is that the development may qualify for investment tax credit and that they would be allowed depreciation on the facilities. The disadvantage with this option, however, is that the County will receive a smaller percentage of the revenue generated at the airport. For this reason, it is important to consider all possibilities before entering into a specific lease agreement.

TABLE 6D
Cash Flow Analysis
San Mateo County
Airport Enterprise Fund

	1996/97	1997/98	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06
OPERATING INCOME:										
T-hangar/shades	$617,700	$707,052	$879,701	$897,295	$915,241	$924,849	$943,346	$962,213	$981,458	$1,001,087
Concessions	$131,433	$134,062	$136,743	$139,478	$142,267	$145,113	$148,015	$150,975	$153,995	$157,075
Tiedowns	$308,760	$314,935	$321,234	$327,659	$334,212	$340,896	$347,714	$354,668	$361,762	$368,997
Transient Parking Fees	$19,137	$19,615	$20,106	$20,608	$21,123	$21,651	$22,193	$22,748	$23,316	$23,899
Fuel Concessions	$22,385	$23,504	$24,679	$25,913	$27,209	$28,569	$29,998	$31,498	$33,073	$34,726
Land & Building Rents	$102,053	$214,253	$218,538	$198,138	$202,101	$206,143	$210,266	$214,471	$218,760	$223,136
Miscellaneous Revenues	$12,164	$12,407	$12,655	$12,908	$13,166	$13,429	$13,698	$13,972	$14,251	$14,537
OPERATING INCOME	$1,213,631	$1,425,828	$1,613,656	$1,621,999	$1,655,319	$1,680,651	$1,715,230	$1,750,545	$1,786,615	$1,823,456
OPERATING EXPENSES:										
Salaries & Benefits	$394,000	$401,880	$409,918	$418,116	$426,478	$435,008	$443,708	$452,582	$461,634	$470,866
Services Fees	$193,000	$196,860	$200,797	$204,813	$208,909	$213,088	$217,349	$221,696	$226,130	$230,653
Supplies & Equipment	$60,000	$61,200	$62,424	$63,672	$64,946	$66,245	$67,570	$68,921	$70,300	$71,706
Indirect Costs	$247,000	$251,940	$256,979	$262,118	$267,361	$272,708	$278,162	$283,725	$289,400	$295,188
OPERATING EXPENSES	$894,000	$911,880	$930,118	$948,720	$967,694	$987,048	$1,006,789	$1,026,925	$1,047,463	$1,068,413
OPERATING INCOME(LOSS)	$319,631	$513,948	$683,538	$673,279	$687,625	$693,603	$708,441	$723,620	$739,151	$755,043
CIP FUNDING SAN CARLOS AIRPORT										
Recommended CIP (-)	$150,000	$270,500	$60,000	$0	$500,000	$1,637,020	$1,637,020	$1,637,020	$1,637,020	$1,637,020
Private Funds (+)	$0	$0	$0	$0	$0	$1,200,000	$1,200,000	$1,200,000	$1,200,000	$1,200,000
Federal Funds (+)	$135,000	$243,450	$54,000	$0	$0	$270,018	$270,018	$270,018	$270,018	$270,018
State Funds (+)	$6,750	$12,173	$2,700	$0	$450,000	$103,501	$103,501	$103,501	$103,501	$103,501
Local Share (-)	$8,250	$14,877	$3,300	$0	$50,000	$63,501	$63,501	$63,501	$63,501	$63,501
CIP FUNDING HALF MOON BAY AIRPORT										
Recommended CIP (-)	$250,000	$1,623,200	$497,100	$500,000	$936,000	$189,520	$189,520	$189,520	$189,520	$189,520
Private Funds (+)	$0	$0	$0	$0	$900,000	$0	$0	$0	$0	$0
Federal Funds (+)	$225,000	$1,460,880	$385,470	$0	$32,400	$63,684	$63,684	$63,684	$63,684	$63,684
State Funds (+)	$11,250	$73,044	$81,194	$450,000	$1,620	$110,068	$110,068	$110,068	$110,068	$110,068
Local Share (-)	$13,750	$89,276	$30,436	$50,000	$1,980	$15,768	$15,768	$15,768	$15,768	$15,768
COMBINED CIP LOCAL SHARES (-)	$22,000	$104,153	$33,736	$50,000	$51,980	$79,269	$79,269	$79,269	$79,269	$79,269
STATE LOAN PROGRAM										
T-hangars/shades Development (-)	$153,263	$222,928	$385,945	$385,945	$385,945	$438,194	$438,194	$438,194	$438,194	$438,194
NET EXCESS OR (DEFICIT)	$144,368	$186,867	$263,857	$237,334	$249,700	$176,140	$190,978	$206,157	$221,689	$237,580

Note: Any Net Excess is anticipated to be utilized by the County to rehabilitate existing facilities (i.e., terminal building, hangars, etc.) at both airports

TABLE 6D (Continued)
Cash Flow Analysis
San Mateo County
Airport Enterprise Fund

	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16
OPERATING INCOME:										
T-hangar/shades	$1,005,891	$1,026,009	$1,046,529	$1,067,459	$1,088,809	$1,110,585	$1,132,797	$1,155,452	$1,178,562	$1,202,133
Concessions	$160,216	$163,420	$166,689	$170,023	$173,423	$176,892	$180,429	$184,038	$187,719	$191,473
Tiedowns	$376,377	$383,904	$391,582	$399,414	$407,402	$415,550	$423,861	$432,339	$440,985	$449,805
Transient Parking Fees	$24,497	$25,109	$25,109	$25,737	$25,737	$26,380	$26,380	$27,040	$27,040	$27,716
Fuel Concessions	$36,463	$38,286	$40,200	$42,210	$44,321	$46,537	$48,864	$51,307	$53,872	$56,566
Land & Building Rents	$227,598	$232,150	$236,793	$241,529	$246,360	$251,287	$256,313	$261,439	$266,668	$272,001
Miscellaneous Revenues	$14,827	$15,124	$15,426	$15,735	$16,049	$16,370	$16,698	$17,032	$17,372	$17,720
OPERATING INCOME	$1,845,869	$1,884,002	$1,922,329	$1,962,107	$2,002,101	$2,043,601	$2,085,342	$2,128,646	$2,172,218	$2,217,413
OPERATING EXPENSES:										
Salaries & Benefits	$480,284	$489,889	$499,687	$509,681	$519,875	$530,272	$540,878	$551,695	$562,729	$573,984
Services Fees	$235,266	$239,971	$244,771	$249,666	$254,659	$259,753	$264,948	$270,247	$275,652	$275,652
Supplies & Equipment	$73,140	$74,602	$76,095	$77,616	$79,169	$80,752	$82,367	$84,014	$85,695	$87,409
Indirect Costs	$301,092	$307,113	$313,256	$319,521	$325,911	$332,429	$339,078	$345,860	$352,777	$359,832
OPERATING EXPENSES	$1,089,781	$1,111,577	$1,133,808	$1,156,484	$1,179,614	$1,203,206	$1,227,270	$1,251,816	$1,276,852	$1,296,876
OPERATING INCOME(LOSS)	$756,088	$772,426	$788,521	$805,623	$822,487	$840,395	$858,071	$876,830	$895,365	$920,537
CIP FUNDING SAN CARLOS AIRPORT										
Recommended CIP (-)	$300,000	$300,000	$300,000	$300,000	$300,000	$300,000	$300,000	$300,000	$300,000	$300,000
Private Funds (+)	$200,000	$200,000	$200,000	$200,000	$200,000	$200,000	$200,000	$200,000	$200,000	$200,000
Federal Funds (+)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
State Funds (+)	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000
Local Share (-)	$10,000	$10,000	$10,000	$10,000	$10,000	$10,000	$10,000	$10,000	$10,000	$10,000
CIP FUNDING HALF MOON BAY AIRPORT										
Recommended CIP (-)	$244,450	$244,450	$244,450	$244,450	$244,450	$244,450	$244,450	$244,450	$244,450	$244,450
Private Funds (+)	$120,000	$120,000	$120,000	$120,000	$120,000	$120,000	$120,000	$120,000	$120,000	$120,000
Federal Funds (+)	$17,217	$17,217	$17,217	$17,217	$17,217	$17,217	$17,217	$17,217	$17,217	$17,217
State Funds (+)	$95,649	$95,649	$95,649	$95,649	$95,649	$95,649	$95,649	$95,649	$95,649	$95,649
Local Share (-)	$11,584	$11,584	$11,584	$11,584	$11,584	$11,584	$11,584	$11,584	$11,584	$11,584
COMBINED CIP LOCAL SHARES (-)	$21,584	$21,584	$21,584	$21,584	$21,584	$21,584	$21,584	$21,584	$21,584	$21,584
STATE LOAN PROGRAM										
T-hangars/shades Development (-)	$337,180	$267,515	$104,498	$104,498	$104,498	$52,249	$52,249	$52,249	$52,249	$52,249
NET EXCESS OR (DEFICIT)	$397,324	$483,327	$662,439	$679,541	$696,405	$766,562	$784,238	$802,997	$821,532	$846,704

Note: Any Net Excess is anticipated to be utilized by the County to rehabilitate existing facilities (i.e., terminal building, hangars, etc.) at both airports

CONTINUOUS PLANNING

The successful implementation of the Half Moon Bay Airport Master Plan will require sound judgement by airport management. Among the more important factors influencing management decisions to implement a recommendation are timing and airport activity. Both of these factors can be used as references in plan implementation. While it was necessary for scheduling and budgeting purposes to focus on the timing of airport development, the actual need for facilities is in fact established by levels of activity. Proper master plan implementation suggests the consideration of the airport activity rather than time as a guide toward scheduling future airport development.

Experience has indicated that major problems materialize from a rigid format for master plans. These problems involve the plan's inflexibility and inherent inability to deal with new issues that develop from unforeseen changes that may occur during the planning period. The format used in the development of the Master Plan has attempted to deal with this issue. This section is titled Continuous Planning for several reasons. The first reason is to emphasize that planning is a continuous process that does not end with the completion of a major project. The second is to recognize this fact without invalidating the overall Master Plan. The primary issues upon which this Master Plan is based are expected to remain valid for a number of years.

The real value of a usable master plan is that it keeps the issues and objectives in the mind of the user. Consequently, the manager is better able to recognize change and its effect. The continuous planning process can make the preparation of a master plan much more cost effective by extending the period of time for which the plan is valid, and can eliminate the need for costly updates.

Guidelines and worksheets are included in the following section for each future year during the initial five-year stage of development from FY1996 to FY2000. Summary worksheets are also included for Stage II (FY2001-FY2005) and Stage III (FY2006-FY2015). All estimated development costs are based on 1996 dollars; therefore, costs must be adjusted by the appropriate inflation rate factor in effect at the time of development.

CONTINUOUS PLANNING AIDS

The continuous planning process allows airport management to consistently monitor the progress of the airport in terms of growth in based aircraft and annual operations, because this growth is critical to the specific timing and need for new airport facilities. The information obtained from this monitoring process will provide the data necessary to determine if the development schedule should be accelerated, decelerated, or maintained as scheduled.

On an annual basis, airport management should compile this information and determine the actual number of total based aircraft, total annual air-

craft operations, and total amounts of fuel sales. Use of the Continuous Planning Chart, **Exhibit 6A**, and the Continuous Planning Graph, **Exhibit 6B**, will enable management to visualize airport activity growth and compare it to the forecast levels. These exhibits are located at the end of this chapter.

With this information, adjustments in the development schedule can be made to effectively deal with variations in forecast or any unanticipated demand that may arise. By closely monitoring the activity and availability of funds with the worksheets provided on the following pages, management will be able to effectively implement the Half Moon Bay Airport Master Plan.

SUMMARY AND CONCLUSIONS

As previously indicated, federal funding will be the primary funding source for development of both County airports and will be instrumental in the implementation of the plan. Airport revenue, private funding, and the State Loan Program will also contribute to financing airport development. The airport will need to keep abreast of all potential funding sources, and will need to research each source on a continuing basis. By closely monitoring the activity and availability of funds with the worksheets provided at the end of this chapter, the Master Plan can be successfully implemented.

95MP15-6A-2/18/97

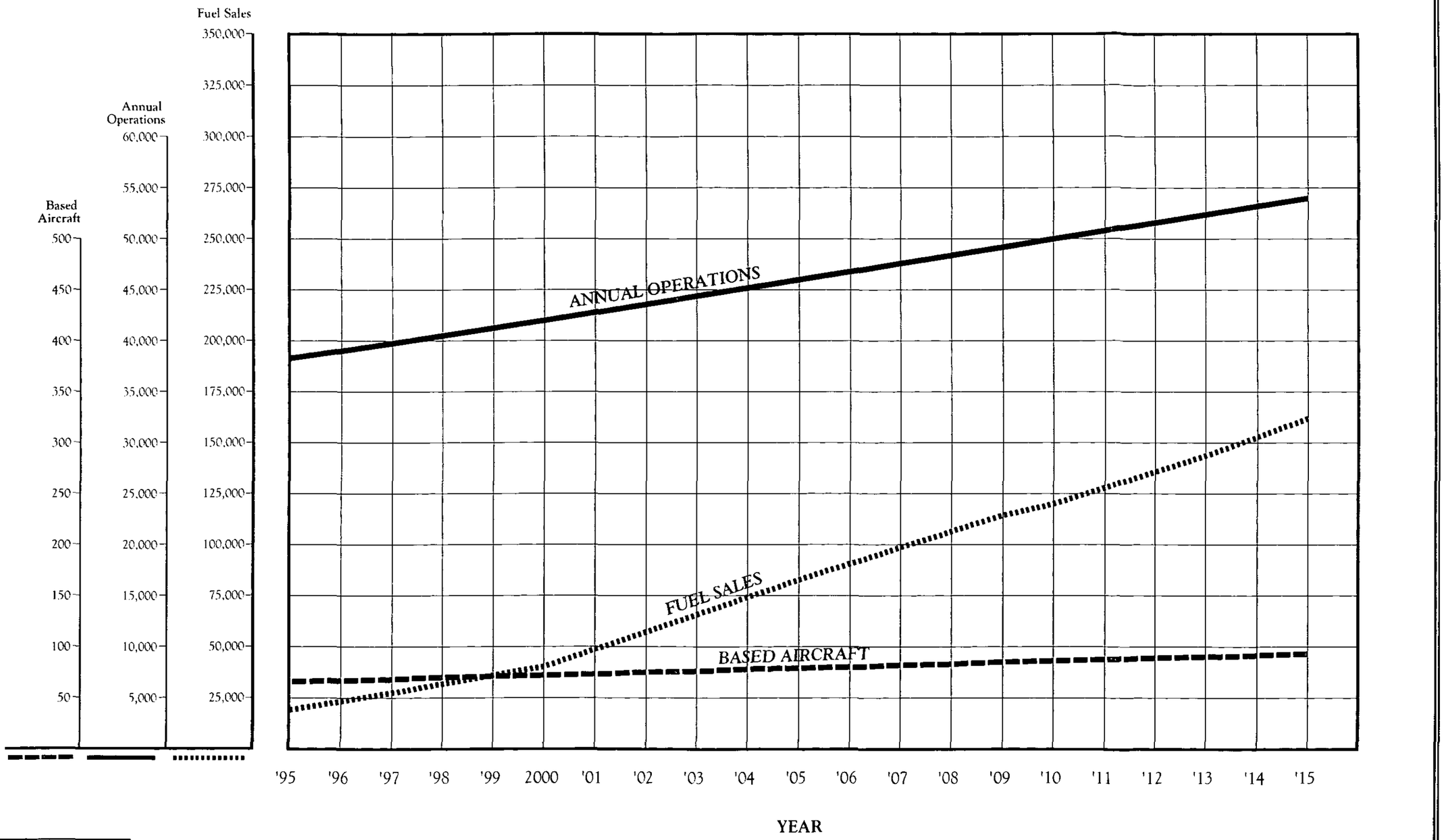
HALF MOON BAY

	Based Aircraft		Annual Operations		Fuel Sales	
Year	Forecast	Actual	Forecast	Actual	Forecast	Actual
1995	66		38,300		19,200	
1996	67		39,040		23,424	
1997	68		39,780		27,648	
1998	70		40,520		31,872	
1999	71		41,260		36,096	
2000	72		42,000		40,320	
2001	73		42800		48,816	
2002	75		43,600		57,312	
2003	76		44,400		65,808	
2004	78		45,200		74,304	
2005	79		46,000		82,800	
2006	80		46,800		90,720	
2007	82		47,600		98,640	
2008	83		48,400		106,560	
2009	85		49,200		114,480	
2010	86		50,000		120,000	
2011	87		50,800		127,920	
2012	89		51,600		135,840	
2013	90		52,400		143,760	
2014	92		53,200		151,680	
2015	93		54,000		162,000	

HALF MOON BAY AIRPORT

Exhibit 6A
CONTINUOUS PLANNING CHART

95-MP01-6B-2/18/97



HALF MOON BAY AIRPORT

Exhibit 6B
CONTINUOUS PLANNING GRAPH

STAGE I
FY1996-FY2000 Airport Development Program and Funding

The following section has been designed to note the funds available so that they can be kept in mind while analyzing the development factors outlined for this period on the next few pages. This section also provides a reminder of other potential sources that might be used in critical situations.

Airport Funds Balance $_____
Contributions/Other $_____
TOTAL $_____

As a reminder, airport development should be keyed to demand (***actual*** activity) rather than to a specific time frame (***forecast*** activity). The spaces provided below allow actual activity data to be recorded for comparison with the forecast levels. This should be the first step in the process of initiating the recommended development program for this period. Significant difference between forecast and actual activity may justify acceleration or deceleration of the airport development schedule.

Item	FY1996		FY1997		FY1998		FY1999		FY2000	
	FCST	ACT	FCST	ACT	FCST	ACT	FCST	ACT	FCST	ACT
Based Aircraft	67		68		70		71		72	
Operations	39,040		39,780		40,520		41,260		42,000	
Fuel Sales (Gal)	23,424		27,648		31,872		36,096		40,320	

Based on the activity comparison above, should the recommended development schedule be maintained? Have new problems, needs or development potentials occurred which may impact the development program? What adjustments in the development schedule are required to effectively deal with these factors?

In order to maintain the continuity of a staged development plan and to meet forecast activity demand, the following development items are recommended. Each item is numbered so that it can be cross-referenced on **Exhibit 6C, Stage I (FY1996-2000) Airport Development Program.** The costs for every development includes 25 percent for engineering, contingency, and administration costs.

STAGE I (Continued)
FY1996-FY2000 Airport Development Program and Funding

TABLE 6E
Capital Improvement Program
Half Moon Bay Airport

	TOTAL	FAA	STATE	LOCAL	PRIVATE
STAGE I (FY1996-FY2000)					
FY1996/1997					
1. Install ASOS-III	$150,000	$135,000	$6,750	$8,250	$0
2. Install PAPIs	$60,000	$54,000	$2,700	$3,300	$0
3. Install/Relocate REILs	$25,000	$22,500	$1,125	$1,375	$0
4. Runway Markings	$15,000	$13,500	$675	$825	$0
FY1996/1997 Subtotal	$250,000	$225,000	$11,250	$13,750	$0
FY1997/1998					
5. Construct Parallel Taxiways (31,250 SY)	$1,093,800	$984,420	$49,221	$60,159	$0
6. Install MITLs (12,100 LF)	$529,400	$476,460	$23,823	$29,117	$0
FY1997/1998 Subtotal	$1,623,200	$1,460,880	$73,044	$89,276	$0
FY1998/1999					
7. Construct Auto Parking (2,200 SY)	$68,800	$0	$61,920	$6,880	$0
8. Construct T-hangars (30 units)	$750,000	$0	$0	$750,000	$0
9. Construct Taxilanes (9,500 SY)	$297,000	$267,300	$13,365	$16,335	$0
10. Construct Access Road (4,200 SY)	$131,300	$118,170	$5,909	$7,222	$0
FY1998/1999 Subtotal	$1,247,100	$385,470	$81,194	$780,437	$0
FY1999/2000					
11. Pavement Preservation	$500,000	$0	$450,000	$50,000	$0
12. Utility Systems Improvements	$250,000	$225,000	$11,250	$13,750	$0
FY1999/2000 Subtotal	$750,000	$225,000	$461,250	$63,750	$0
FY2000/2001					
13. Construct Conventional Hangar	$900,000	$0	$0	$0	$900,000
14. Install Recreational Tiedowns (1,900SY)	$36,000	$32,400	$1,620	$1,980	$0
FY2000/2001 Subtotal	$936,000	$32,400	$1,620	$1,980	$900,000
STAGE I TOTAL	$4,806,300	$2,928,750	$628,358	$949,193	$900,000

Inflation Adjustment: _____% X $4,806,300 = $_____

STAGE I (Continued)
FY1996-FY2000 Airport Development Program and Funding

Plus or Minus Other Proposed Development:

Development Items	Total	FAA	State	Local	Private/ Loan
1.					
2.					
3.					
4.					
Total					

Since the FAA Fiscal Year is from October through September, efforts should begin immediately to identify the development that will be eligible for federal, state or other funding during this period. San Mateo County should have applications submitted early for the maximum funding possible in case additional funds become available.

95MP01-6C-2-19-97

LEGEND:

1. CONVENTIONAL HANGAR
2. T-HANGAR
3. T-HANGAR EXPANSION AREA
4. AUTO PARKING
5. COMMERCIAL/INDUSTRIAL DEVELOPMENT AREA
6. HELIPORT
7. RECREATIONAL AIRCRAFT PARKING

AIRPORT PROPERTY LINE

KEY:

(1) DEVELOPMENT ITEM

NOTE: ALL PORT-A-PORTS AND THE T-HANGAR AT MIDFIELD ARE ULTIMATELY TO BE REMOVED AND THEREFORE ARE NOT SHOWN FOR CLARITY.

MOSS BEACH

SAN VICENTE CREEK

DENNISTON CREEK

BRIDGEPORT DR.

CORAL REEF

SONORA AVE.

ETHELDORE ST.

CABRILLO HIGHWAY

ACCESS ROAD

ACCESS ROAD

CAPISTRANO

MARINE BLVD.

CYPRESS AVE.

REDONDO PARK

ULT. RPZ
250' X 1000' X 450'
VISIBILITY NOT LESS
THAN ONE MILE

ULT. PAPI-2

ULT. ASOS

Exist. VASI-4

EXIST. DISPLACED THRESHOLD TO BE REMOVED

ULT. RPZ
250' X 1000' X 450'
VISIBILITY NOT LESS
THAN ONE MILE

CALIFORNIA AVE.

CONNELL

EXIST. 5000' X 150' RUNWAY

AIRPORT ST.

ULT. PAPI-2

ULT. REIL

EXIST. DISPLACED THRESHOLD TO BE REMOVED

PRINCETON

DERECHO ST.

RELOCATED REIL

LOS BANOS AVE.

BEACH WAY

BERNAL AVE.

OCEAN BLVD.

LA GRANADA

BARRANCA ST.

CULEBRA ST.

STANFORD

POINT AVE.

MSM

HALF MOON BAY

NORTH

0 600 1200

SCALE IN FEET

PACIFIC OCEAN

JAMES V. FITZGERALD MARINE RESERVE

HALF MOON BAY AIRPORT

Exhibit 6C
STAGE I (FY 1996 - 2001)
AIRPORT DEVELOPMENT PROGRAM

STAGE II
FY2001-FY2005 Airport Development Program and Funding

The following section has been designed to note the funds available so that they can be kept in mind while analyzing the development factors outlined for this period on the next few pages. This section also provides a reminder of other potential sources that might be used in critical situations.

Airport Funds Balance $_____
Contributions/Other $_____
TOTAL $_____

As a reminder, airport development should be keyed to demand (***actual*** activity) rather than to a specific time frame (***forecast*** activity). The spaces provided below allow actual activity data to be recorded for comparison with the forecast levels. This should be the first step in the process of initiating the recommended development program for this period. Significant difference between forecast and actual activity may justify acceleration or deceleration of the airport development schedule.

Item	FY2001		FY2002		FY2003		FY2004		FY2005	
	FCST	ACT	FCST	ACT	FCST	ACT	FCST	ACT	FCST	ACT
Based Aircraft	73		75		76		78		79	
Operations	42,800		43,600		44,400		45,200		46,000	
Fuel Sales (Gal)	48,816		57,312		65,808		74,304		82,800	

Based on the activity comparison above, should the recommended development schedule be maintained? Have new problems, needs or development potentials occurred which may impact the development program? What adjustments in the development schedule are required to effectively deal with these factors?

In order to maintain the continuity of a staged development plan and to meet forecast activity demand, the following development items are recommended. Each item is numbered so that it can be cross-referenced on **Exhibit 6D, Stage II (FY2001-2005) Airport Development Program.** The costs for every development includes 25 percent for engineering, contingency, and administration costs.

STAGE II (Continued)
FY2001-FY2005 Airport Development Program and Funding

TABLE 6F
Capital Improvement Program
Half Moon Bay Airport

	TOTAL	FAA	STATE	LOCAL	PRIVATE
STAGE II (FY2001/2002-FY2005/2006)					
1. Access Roads (7,000 SY)	$218,800	$196,920	$9,846	$12,034	$0
2. Construct Auto Parking (3,000 SY)	$93,800	$0	$84,420	$9,380	$0
3. Construct Taxilane (3,200 SY)	$100,000	$90,000	$4,500	$5,500	$0
4. Construct T-hangars (15 units)	$375,000	$0	$0	$375,000	$0
5. Install Recreational Tiedowns (1,400 SY)	$35,000	$31,500	$1,575	$1,925	
6. Pavement Preservation	$500,000	$0	$450,000	$50,000	$0
STAGE II TOTAL	$1,322,600	$318,420	$550,341	$453,839	$0

Inflation Adjustment: _____% X $1,322,600 = $_____

Plus or Minus Other Proposed Development:

Development Items	Total	FAA	State	Local	Private/ Loan
1.					
2.					
3.					
4.					
Total					

Since the FAA Fiscal Year is from October through September, efforts should begin during Stage I to identify the development that will be eligible for federal, state or other funding during this period. San Mateo County should have applications submitted early for the maximum funding possible in case additional funds become available.

95MPD1-6D-2-19-97

LEGEND:

1. CONVENTIONAL HANGAR
2. T-HANGAR
3. T-HANGAR EXPANSION AREA
4. AUTO PARKING
5. COMMERCIAL/INDUSTRIAL DEVELOPMENT AREA
6. HELIPORT
7. RECREATIONAL AIRCRAFT PARKING

AIRPORT PROPERTY LINE

KEY:

(1) DEVELOPMENT ITEM

NOTE: ALL PORT-A-PORTS AND THE T-HANGAR AT MIDFIELD ARE ULTIMATELY TO BE REMOVED AND THEREFORE ARE NOT SHOWN FOR CLARITY.

MOSS BEACH

SAN VICENTE CREEK

DENNISTON CREEK

BRIDGEPORT DR.

CORAL REEF

SONORA AVE.

ETHELDORE ST.

CABRILLO HIGHWAY

ACCESS ROAD

CAPISTRANO

CYPRESS AVE.

MARINE BLVD.

ULT. RPZ
250' X 1000' X 450'
VISIBILITY NOT LESS
THAN ONE MILE

ULT. PAPI-2

ULT. ASOS

Exist. VASI-4

EXIST. DISPLACED
THRESHOLD TO
BE REMOVED

ULT. RPZ
250' X 1000' X 450'
VISIBILITY NOT LESS
THAN ONE MILE

CALIFORNIA AVE.

CONNELL

EXIST. 5000' X 150' RUNWAY

AIRPORT ST.

ULT. PAPI-2

ULT. REIL

EXIST. DISPLACED
THRESHOLD TO
BE REMOVED

PRINCETON

DERECHO ST.

RELOCATED REIL

REDONDO PARK

LOS BANOS AVE.

BEACH WAY

BERNAL AVE.

OCEAN BLVD.

LA GRANADA

BARRANCA ST.

CULEBRA ST.

STANFORD

POINT AVE.

WEST

HALF MOON BAY

PACIFIC

OCEAN

NORTH

0 600 1200

SCALE IN FEET

HALF MOON BAY AIRPORT

JAMES V. FITZGERALD MARINE RESERVE

Exhibit 6D
STAGE II (FY 2001 - 2005)
AIRPORT DEVELOPMENT PROGRAM

STAGE III
FY2006-FY2015 Airport Development Program and Funding

The following section has been designed to note the funds available so that they can be kept in mind while analyzing the development factors outlined for this period on the next few pages. This section also provides a reminder of other potential sources that might be used in critical situations.

Airport Funds Balance $_____
Contributions/Other $_____
TOTAL $_____

As a reminder, airport development should be keyed to demand (***actual*** activity) rather than to a specific time frame (***forecast*** activity). The spaces provided below allow actual activity data to be recorded for comparison with the forecast levels. This should be the first step in the process of initiating the recommended development program for this period. Significant difference between forecast and actual activity may justify acceleration or deceleration of the airport development schedule.

Item	FY2006		FY2007		FY2008		FY2009		FY2010	
	FCST	ACT	FCST	ACT	FCST	ACT	FCST	ACT	FCST	ACT
Based Aircraft	80		82		83		85		86	
Operations	46,800		47,600		48,400		49,200		50,000	
Fuel Sales (Gal)	90,720		98,640		106,560		114,480		120,000	

Item	FY2011		FY2012		FY2013		FY2014		FY2015	
	FCST	ACT	FCST	ACT	FCST	ACT	FCST	ACT	FCST	ACT
Based Aircraft	87		89		90		92		93	
Operations	50,800		51,600		52,400		53,200		54,000	
Fuel Sales (Gal)	127,920		135,840		143,760		151,680		162,000	

Based on the activity comparison above, should the recommended development schedule be maintained? Have new problems, needs or development potentials occurred which may impact the development program? What adjustments in the development schedule are required to effectively deal with these factors?

In order to maintain the continuity of a staged development plan and to meet forecast activity demand, the following development items are recommended. Each item is numbered so that it can be cross-referenced on **Exhibit 6E, Stage III (FY2006-2015), Airport Development Program.** The costs for every development includes 25 percent for engineering, contingency, and administration costs.

TABLE 6G
Capital Improvement Program
Half Moon Bay Airport

	TOTAL	FAA	STATE	LOCAL	PRIVATE
STAGE III TOTAL (FY2006/2007-FY2015/2016)					
1. Construct Taxilane (1,600 SY)	$50,000	$45,000	$2,250	$2,750	$0
2. Construct T-hangars (15 units)	$375,000	$0	$0	$375,000	$0
3. Construct Conventional Hangar	$1,200,000	$0	$0	$0	$1,200,000
4. Access Road (3,400 SY)	$106,300	$95,670	$4,784	$5,847	$0
5. Construct Auto Parking (1,700 SY)	$53,200	$0	$47,880	$5,320	$0
6. Install Recreational Tiedowns (1,400 SY)	$35,000	$31,500	$1,575	$1,925	$0
7. Pavement Preservation	$1,000,000	$0	$900,000	$100,000	$0
STAGE III TOTAL	$2,819,500	$172,170	$956,489	$490,842	$1,200,000

Inflation Adjustment: _____% X $2,819,500 = $_____

Plus or Minus Other Proposed Development:

Development Items	Total	FAA	State	Local	Private/ Loan
1.					
2.					
3.					
4.					
Total					

Since the FAA Fiscal Year is from October through September, efforts should begin during Stage II to identify the development that will be eligible for federal, state or other funding during this period. San Mateo County should have applications submitted early for the maximum funding possible in case additional funds become available.

95MP01-6E-2-19-97

LEGEND:

1. CONVENTIONAL HANGAR
2. T-HANGAR
3. T-HANGAR EXPANSION AREA
4. AUTO PARKING
5. COMMERCIAL/INDUSTRIAL DEVELOPMENT AREA
6. HELIPORT
7. RECREATIONAL AIRCRAFT PARKING

AIRPORT PROPERTY LINE

KEY:

(1) DEVELOPMENT ITEM

NOTE: ALL PORT-A-PORTS AND THE T-HANGAR AT MIDFIELD ARE ULTIMATELY TO BE REMOVED AND THEREFORE ARE NOT SHOWN FOR CLARITY.

MOSS BEACH

SAN VICENTE CREEK

DENNISTON CREEK

BRCOKEPORT DR.

CORAL REEF

SONORA AVE.

ETHELDORE ST.

CABRILLO HIGHWAY

ACCESS ROAD

CAPISTRANO

MARINE BLVD.

ULT. RPZ
250' X 1000' X 450'
VISIBILITY NOT LESS
THAN ONE MILE

ULT. PAPI-2

ULT. ASOS

Exist. VASI-4

EXIST. DISPLACED THRESHOLD TO BE REMOVED

ULT. RPZ
250' X 1000' X 450'
VISIBILITY NOT LESS
THAN ONE MILE

CALIFORNIA AVE.

CORNELL

EXIST. 5000' X 150' RUNWAY

AIRPORT ST.

ULT. PAPI-2

ULT. REIL

EXIST. DISPLACED THRESHOLD TO BE REMOVED

PRINCETON

CYPRESS AVE.

REDONDO PARK

LOS BANOS AVE.

DERECHO ST.

RELOCATED REIL

STANFORD

BEACH WAY

BERNAL AVE.

LA GRANADA

BARRANCA ST.

CULEBRA ST.

POINT AVE.

WEST

HALF MOON BAY

OCEAN BLVD.

NORTH

0 600 1200

SCALE IN FEET

PACIFIC OCEAN

JAMES V. FITZGERALD MARINE RESERVE

HALF MOON BAY AIRPORT

Exhibit 6E
STAGE III (FY 2006 -2016)
AIRPORT DEVELOPMENT PROGRAM

SAN MATEO COUNTY
AIRPORTS
HALF MOON BAY

Appendix A
GLOSSARY/ABBREVIATIONS

GLOSSARY

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

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

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

Airport Reference Code (ARC): A coding system used to relate airport design criteria to the operational and physical characteristics of the airplanes expected to operate at the airport.

Airport Traffic Control Tower (ATCT): a central operations facility in the terminal air traffic control system, consisting of a tower, including an associated IFR room if radar equipped, using air/ground communications and/or radar, visual signaling and other devices, to provide safe and expeditious movement of terminal air traffic.

Air Route Traffic Control Center (ARTCC): a facility established to provide air traffic control service to aircraft operating on an IFR flight plan within controlled airspace and principally during the enroute phase of flight.

Approach 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.

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

Base leg: a flight path at right angles to the landing runway off its approach end. The base leg normally extends from the downwind leg to the intersection of the extended runway centerline.

Compass locator (LOM LMM): a low power low/medium frequency radio-beacon installed in conjunction with the instrument landing system at one or two of the marker sites.

Control zone: airspace extending upward from the ground which may include one or more airports and is normally a circular area of five statute miles in radius with extensions, where necessary, to include instrument approach and departure paths.

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

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

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

Downwind leg: A flight path parallel to the landing runway in the direction *opposite* the landing direction.

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

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

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

General aviation (GA): that portion of civil aviation which encompasses all facets of aviation except air carriers holding a Certificate of Convenience and Necessity, large aircraft commercial operators military aircraft.

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

Global Positioning Satellite System (GPS): a navigational system utilizing satellites to provide non-precision guidance in azimuth, elevation, and distance measurement.

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

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. It is prescribed and approved for a specific airport by competent authority.

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

Instrument Landing System (ILS): a precision instrument approach system which normally consists of the following electronic components and visual aids: localizer, glide slope, outer marker, middle market, and approach lights.

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

Localizer type directional aid (LDA): a facility of comparable utility and accuracy to a localizer, but is not part of a complete ILS and is not aligned with the runway.

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

Non-directional beacon (NDB): a radio beacon transmitting non-directional signals that a pilot of an aircraft equipped with direction finding equipment can determine his/her bearing to or from the radio beacon and "home" on or track to or from the station. When the radio beacon is installed in conjunction with the Instrument Landing System market, 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, GPS, NDB, or LOC.

Operation: a take-off or a landing.

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

Poor Visibility Condition (PVC): Weather conditions whenever cloud ceiling is less that 500 feet and/or visibility is less than one statute mile.

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

Precision approach procedure: a standard instrument approach procedure in which an electronic glide slope is provided, such as ILS. GPS precision approach may be provided in the future.

Precision instrument runway: a runway having a existing Instrument Landing System (ILS).

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

Special VFR (SVFR): Weather conditions less than VFR, but greater that IFR. SVFR operations can only be conducted if approved by the controlling ATC facility.

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

Victor airway: a control area or portion thereof established in the form of a corridor, the centerline of which is defined by VOR's.

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

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

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

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/Tactical Air Navigation (VORTAC): a navigation aid providing VOR azimuth, TACAN azimuth, and TACAN distance-measuring equipment (DME) at one site.

ABBREVIATIONS

AGL: above ground level

AIP: airport improvement program

ALP: airport layout plan

ALS: approach lighting system

ARFF: airport rescue and firefighting

ARTCC: air route traffic control center

ASOS: automated surface observing system

ATCT: airport traffic control tower

AWOS: automated weather observing system

CIP: capital improvement program

DME: distance measuring equipment

DNL: average yearly day-night sound level

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

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

FAA: Federal Aviation Administration

F.A.R.: Federal Aviation Regulations

FBO: fixed base operator

GPS: global positioning satellite system

GS: glide slope

IFR: instrument flight rules (F.A.R. Part 91)

ILS: instrument landing system

LMM: compass locator at middle marker

LOC: ILS localizer

LOM: compass locator at outer marker

MIRL: medium intensity runway lights

MITL: medium intensity taxiway lights

MM: middle marker

MSL: mean sea level

NAVAID: navigational aid

NDB: non-directional beacon

NM: nautical mile

OM: outer marker

PAPI: precision approach path indicator

PVC: poor visibility condition

REIL: runway end identifier lights

SEL: sound exposure level

SVFR: special visual flight rules

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

TACAN: tactical air navigation system

TRACON: terminal radar approach control

UHF: ultra high frequency

VASI: visual approach slope indicator

VFR: visual flight rules (F.A.R. Part 91)

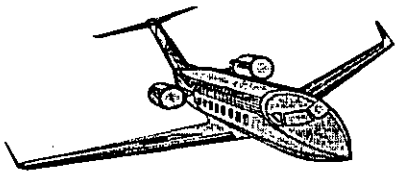
VHF: very high frequency

VOR: very high frequency omnidirectional range

VORTAC: (see VOR and TACAN)

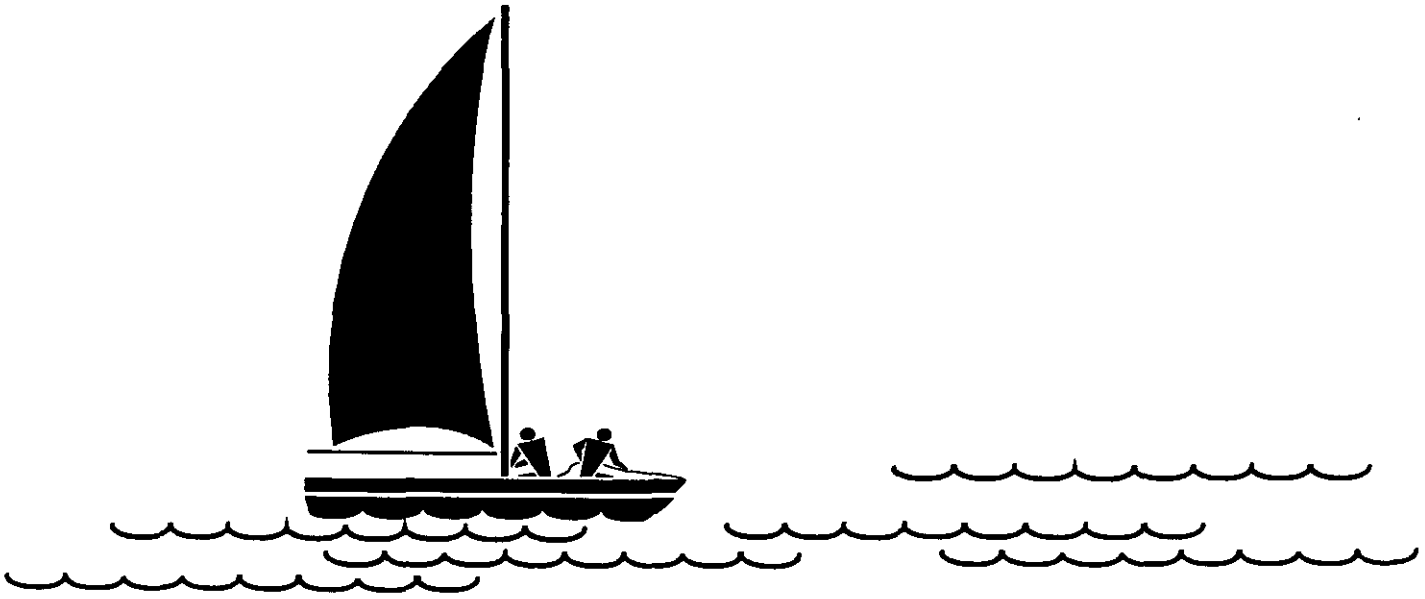
SAN MATEO COUNTY
AIRPORTS
HALF MOON BAY

Appendix B
ECONOMIC BENEFITS -1995



Economic Benefit Study

Half Moon Bay Airport



Coffman Associates
and
Arizona State University

Contents

Economic Benefit Study
Half Moon Bay Airport

ECONOMIC BENEFIT STUDY *Half Moon Bay Airport*

OVERVIEW

This report presents the results of a study of the economic benefits of Half Moon Bay Airport on the airport service area for calendar year 1995. (The airport service area is the coastal portion of San Mateo County, California, with a population of some 45,000 residents.)

BENEFIT TYPES AND MEASURES

The methodology follows procedures recommended by the Federal Aviation Administration and the California Department of Transportation (Caltrans).

There are three ***types*** of economic benefits associated with activity at Half Moon Bay Airport.

Direct Benefits result from (a) **on-airport economic activity** of airport business such as fixed base operators, all other airport tenants, and government agencies including the airport authority as well as (b) **off-airport economic activity**, which includes spending by air travelers for lodging, restaurants, entertainment, ground transportation and retail goods and services.

Induced Benefits are the multiplier effects of the Direct Benefits. For example, when an aircraft mechanic's wages are spent to purchase food, housing, clothing, and medical services, these dollars induce more jobs and income in the general economy of the region, creating "second round" spending.

Total Benefits are the sum of the Direct and Induced Benefits, and therefore encompass both the initial and secondary economic impacts of the airport on the service area.

There are four ***measures*** of economic benefits used in this study:

- **Gross Revenues**
- **Value Added**
- **Payroll**
- **Employment**

Gross revenues measure the total flow of dollars from aviation-related activity and include total sales of business firms and budgets of administrative agencies.

Value added is a measure of new output created within the region. Value added results when input materials are processed by labor to produce products or services.

For example, if aviation fuel is brought into the region at a wholesale price of $1,000 and sold at retail to general aviation aircraft pilots for $1,100, the gross revenue is $1,100 and the value added is $100.

Typically, economic benefit studies emphasize value added as the major indicator of economic significance.

Payroll is one component of value added, representing the payment for the labor used to create new output from aviation-related activity

Employment is a measure of the number of jobs required to create the gross revenues, and value added.

ECONOMIC BENEFITS: 1995

The economic benefits of Half Moon Bay Airport in the year 1995 are shown below and in detail in Table 1.

The airport was the source of gross revenues of $2.8 million dollars, including Direct and Induced Benefits incorporating all multiplier effects of second round spending.

Value added, or net new production related to the presence of Half Moon Bay Airport, was $2.3 million.

This spending and output supported 52 jobs within the service area of the airport, with a payroll of $1.3 million.

Half Moon Bay Airport

Total Economic Benefits

- 52 Jobs Supported
- $1.3 Million Total Payroll
- $2.3 Million Total Value Added
- $2.8 Million Gross Revenues

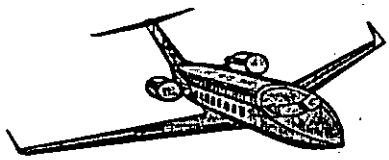


Table 1
Half Moon Bay Airport

Total Economic Benefits: 1995

	Gross Revenues	Value Added	Payroll	Employees
Airport Operations	**$772,220**	**$519,410**	**$256,000**	**12**
Air Taxi				
Fuel Sales				
Food Services				
Charter Services				
Aircraft Maintenance				
Airport Administration				
Capital Projects				
Air Visitors	**$749,700**	**$531,216**	**$285,422**	**18**
Lodging				
Food/Drink				
Retail Goods/Services				
Entertainment				
Transportation				
Direct Benefits	**$1,521,920**	**$1,050,626**	**$541,422**	**30**
Induced Benefits	**$1,295,660**	**$1,295,660**	**$748,000**	**22**
TOTAL BENEFITS	**$2,817,580**	**$2,346,286**	**$1,289,422**	**52**

Notes: Gross Revenues are total sales. Value Added is spending for goods and services supplied within the region plus payroll outlays to workers. Only Value Added has a multiplier effect within the regional economy. Total Benefits include spending induced by multiplier effects. Multipliers are from the Regional Input Output Modeling System, U. S. Department of Commerce, and Caltrans.

DIRECT BENEFITS

The combined Direct Benefits from on-airport and off-airport economic activity in the Half Moon Bay Airport service area in 1995 were:

- **$1.5 Million Gross Revenues**
- **$1.1 Million Value Added**
- **$541,422 Payroll**
- **30 Jobs**

These measures represent the amount of "first round" gross spending, value added (new output), payroll, and jobs in the service area that were due to the direct suppliers and users of aviation services at Half Moon Bay Airport during 1995.

Airport Operations

The suppliers of aviation services located on Half Moon Bay Airport include fixed base operators providing fuel, maintenance and aircraft storage; charter services; food services; and the airport administration.

On-airport operations at Half Moon Bay Airport created 1995 economic benefits of:

- **$772,220 Gross Revenues**
- **$519,410 Value Added**
- **$256,000 Payroll**
- **7 Aviation Jobs**
- **5 Construction Jobs**

Gross revenues measure total sales by businesses on the airport and are equivalent to total spending by all customers for the year. Gross revenues from on-airport operations in 1995 were $772,220.

On-airport economic activity at Half Moon Bay Airport created value added within the service area of $519,410 in 1995.

There were 7 full time equivalent on-airport aviation workers employed by private businesses and 1 employee assigned to Half Moon Bay Airport from the Airports Division of the Department of Public Works of San Mateo County. This is a rotating position budgeted to San Carlos Airport and is not included in payroll figures for Table 1. Capital projects at Half Moon Bay Airport created an additional 5 worker-years from construction contracts. Airport workers earned a payroll of $256,000 in 1995.

Air Visitors

Substantial economic benefits of aviation result from spending by the many visitors that arrive in the coastal region by general aviation aircraft. These travelers spent throughout the year for lodging, food and drink, entertainment (such as golf and other attractions), retail goods and services, and ground transportation.

Air travelers visiting Half Moon Bay Airport created 1995 economic benefits of:

- **$749,700 Gross Revenues**
- **$531,216 Value Added**
- **$285,422 Payroll**
- **18 Jobs**

During calendar year 1995, there were 9,000 general aviation visitors to San Mateo

County that arrived at Half Moon Bay Airport. These travelers contributed 10,710 visitor days of spending to the local economy, at $70 per person per day.

Spending by air travelers on lodging, food, drink, entertainment, retail goods and services, and various ground transportation services summed to $749,700 of gross revenues for regional businesses in the hospitality industry in 1995.

Value added created in the local economy due to spending by air travelers arriving at Half Moon Bay Airport was $531,216.

There were 18 workers in San Mateo County employed serving air visitors to Half Moon Bay Airport, earning a payroll of $285,422 .

On-airport operations and off-airport spending by air visitors are two distinct categories of Direct Benefits stemming from the presence of Half Moon Bay Airport. On-airport employment of 12 private sector workers plus the one worker assigned from the San Mateo County Division of Airports was smaller than the off-airport employment of 18 jobs created by visitor spending. The off-airport payroll for workers serving visitors was approximately $30,000 greater than the payroll created by on-airport activity.

INDUCED BENEFITS

The Direct Benefits described above include no multiplier effects. However, dollars spent in the Half Moon Bay Airport service area by suppliers or users of aviation services create or induce additional output, jobs and payroll, as they circulate within the economy, creating "second round" benefits. Induced impacts occur throughout the service area whenever an aviation-related firm or agency buys supplies and services locally, pays wages to its workers, or undertakes capital expenditures. All of these outlays create local jobs, revenues, and income as the dollars re-circulate through the economy.

The Induced Benefits of Half Moon Bay Airport in 1995 included:

- **$1.3 Million Value Added**
- **$748,000 Payroll**
- **22 Jobs**

Induced multiplier effects created value added of $1.3 million, and an additional 22 jobs in the service area with a payroll of $748,000. The average salary of these jobs was $34,000. While first round spending creates jobs in industries related to suppliers and users of aviation services, second-round effects create jobs in *all* sectors including medical, financial, and technical, as well as retail and services.

TOTAL BENEFITS

The Total Benefits of the airport in 1995, combining Direct and Induced Benefits were:

- **$2.8 Million Gross Revenues**
- **$2.3 Million Value Added**
- **$1.3 Million Payroll**
- **52 Jobs**

Note that gross revenues (sales) are not subject to multiplier effects, since only the value added component stays within the local economy. However, as value added increases, revenues increase by the same amount, reflecting spending on new output within the service area.

Therefore, total revenues can be computed as the sum of Direct gross revenues plus the revenues created from spending on Induced value added. Total revenues created by Direct and Induced spending summed to $2.8 million in 1995, but value added was only 83 percent of this amount.

Total revenues are important as a base for tax collections. Value added is important as a measure of locally produced output. The total value added benefit of Half Moon Bay Airport was $2.3 million in 1995.

The value added created by Half Moon Bay Airport represents the contribution of the airport to California Gross State Product, a measure of the market value of all final goods and services produced in the state.

Payroll contributes to the earnings component of California Personal Income. The payroll of $1.3 million accounts for 55 percent of the total of $2.3 million value added created by the airport.

The ratio of Total Benefits to Direct Benefits as measured by value added was $2.8 million divided by $1.5 million = 1.87. This is the average multiplier for Half Moon Bay Airport, implying that each $100 spent on airport operations or by air travelers created an additional $87 of new output before it left the service area.

Similarly, every job on the airport or serving air travelers created, on the average, three-fourths of an additional job in the service area. Each $100 of payroll spending by aviation-related workers re-circulated in the economy to create an additional $138 of payroll in all other sectors.

TAX BENEFITS

in addition to the various fees paid by users of the airport, the presence of the airport contributes to tax revenues through both state and local tax collections.

In 1995, an estimated $251,000 of tax revenues were collected as a result of activity related to Half Moon Bay Airport, including both Direct Benefits and Induced Benefits due to multiplier effects (Table 2).

Table 2
Half Moon Bay Airport
Tax Benefits From Airport Activity

Direct Taxes	
Local Taxes	$109,736
State Taxes	23,410
Subtotal	**$133,146**
Induced Taxes	
Local Taxes	$97,175
State Taxes	20,731
Subtotal	**$117,906**
Direct + Induced	
Local Taxes	$206,911
State Taxes	44,141
TOTAL TAXES	**$251,052**

Source: Derived from *State of California Airport Economic Impact Model*, Caltrans

The estimates in Table 2 were based on the historical relationship of Gross State Product and the operating budgets of state agencies and local jurisdictions built into the Caltrans *State of California Airport Economic Impact Model*. The relatively higher amount of local taxes compared to state taxes reflects the return of state taxes to local jurisdictions.

Economic activity due to the presence of Half Moon Bay Airport created Direct (aviation-related) tax revenues of $133,146 in 1995. This figure included sales and excise taxes from airport tenants such as FBO's and charter services, possessory interest property taxes paid by businesses located on the airport, assessments on based general aviation aircraft, and income taxes on wages earned as a result of airport operations.

Direct taxes also include government revenues collected from air visitors as sales and bed taxes, as well as taxes paid by businesses such as auto rental that serve air travelers.

Induced taxes, however, are a broader measure of revenues, representing taxes from all sources, including sales, property, and income, created after first round spending from suppliers and users of aviation services recirculates within the economy. Total Induced taxes contributed an additional $117,906 to state and local revenues in 1995.

Combined first-round tax revenues from airport operations and visitor spending plus tax revenues from Induced spending produced overall local tax collections related to aviation activity of $206,911, while Direct plus Induced state tax collections were an additional $44,141.

DAILY BENEFITS

Airports are available to serve consumers, businesses, and the flying public every day of the year. Therefore, it is often illuminating to measure the daily benefits of an airport to illustrate its importance to the local economy.

On a typical day in 1995, there were 42 operations by itinerant general aviation aircraft and an additional 63 local operations at Half Moon Bay Airport.

During each day of the year in 1995, Half Moon Bay Airport generated $7,700 gross revenues within its service area (see figure). These revenues created daily value added for the region of $6,425.

Revenues and production create jobs, not only for the suppliers and users of aviation services, but throughout the economy. Each day, the economic activity associated with Half Moon Bay Airport provided 12 jobs directly on the airport and in total supported 52 local jobs in the airport service area.

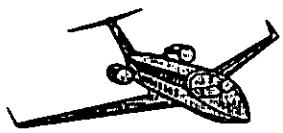
These 52 workers earned a daily payroll of $3,500 in 1995, which was re-circulated in the local economy as consumer spending for goods and services.

Daily tax revenues averaging $688 were generated by economic activity on and off the airport and within the local economy by successive effects of aviation related spending.

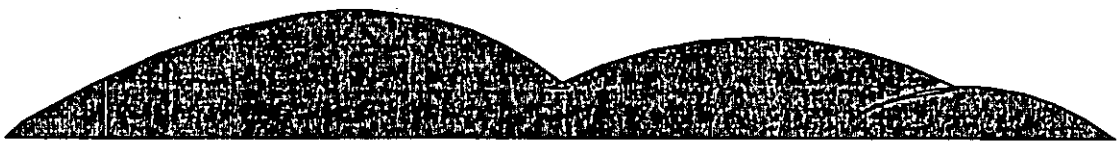
On a typical day during the year, there were 29 visitors in the area who arrived at Half Moon Bay Airport by general aviation aircraft. The average expenditures for these visitors on a given day was $2,050.

Half Moon Bay Airport
Daily Economic Benefits

- $7,700 Gross Revenues
- $6,425 Value Added
- 52 Local Jobs Supported
- $3,500 Payroll Earned



- $688 Tax Revenues
- 29 General Aviation Visitors
- $2,050 Visitor Spending



DETAIL ON BENEFITS

This section provides detail on the benefits of Half Moon Bay Airport, including the Direct Benefits of airport operations and visitor spending, and the Induced Benefits due to multiplier effects.

AIRPORT OPERATIONS

Table 3 illustrates the Direct Benefits from the annual operation of Half Moon Bay Airport. Data on revenues, expenditures, payroll, and employment were obtained from a survey conducted on the airport during 1995.

There were 6 aviation-related private employers on the airport during the 1995 study period. Aviation supplies and services available at Half Moon Bay Airport include fuel, maintenance, air taxi and charter services, in addition to food services. Private contractors also carried out various improvement projects during the year and employed workers on the airport.

There is no tower at Half Moon Bay Airport and therefore no assigned FAA or contract staff for air traffic control. Non-aviation employers and workers on the airport are not included in this study.

On-airport employers reported gross revenues of $772,220 in 1995. Private employers had revenues of $287,220. However, the largest source of revenue flows was $485,000 paid out for capital improvement projects on the airport that directly benefitted aviation activity.

Among the capital improvements at Half Moon Bay Airport during 1995 were:

- aircraft run up areas
- taxiway repairs
- wash water recycling system
- hangar sewage system
- fuel system replacement

Run up areas were needed to reduce prop blast effects on aircraft in line to depart. Taxiway repairs included overlay and reconstruction of pavement. The wash water drainage system improvements were intended to bring the airport into compliance with drainage regulations.

Value added due to the direct presence of on-airport operations was $519,410. The value added entries of Table 3 represent the sum of (a) spending for materials, supplies and services plus (b) personnel outlays made by airport employers.

Expenditures by on-airport businesses for local goods, materials, and supplies are an important part of the total significance of the airport, since this spending creates revenues, jobs, and payroll within the service area. Airport tenants spent $142,160 on goods and services in 1995.

Similarly, paychecks received by workers on the airport are used for purchases in the local community, and thus create additional revenues, income, and employment in the airport service area. The total payroll for aviation employers was $62,000 in 1995. Capital improvements required contract worker labor equivalent to 5 full time private sector jobs in construction and maintenance.

Table 3
Half Moon Bay Airport

Direct Benefits From Airport Operations:
Revenues, Value Added, Payroll and Jobs

	Gross Revenues	Value Added	Payroll	Employees
Airport Businesses	**$287,220**	**$204,160**	**$62,000**	**7**
Fuel Sales				
Food Services				
Charter Services				
Aircraft Storage				
Aircraft Maintenance				
Airport Administration				
Capital Projects	**$485,000**	**$315,250**	**$194,000**	**5**
DIRECT BENEFITS	**$772,220**	**$519,410**	**$256,000**	**12**

Note: Value Added is expenditures by airport businesses, airport administration, all other airport tenants, and construction firms for goods and services produced locally, including labor and personnel.

Source: Survey of airport employers and tenants, 1995.

BENEFITS FROM BASED AIRCRAFT

Half Moon Bay Airport is home for 66 based general aviation aircraft used for business and recreation. A substantial portion of the revenue created on the airport can be attributed to operating outlays and maintenance expenditures by based aircraft owners. A survey of owners was conducted in 1995 to compile current information on expenditures and usage patterns for based aircraft at Half Moon Bay Airport.

The typical aircraft based at Half Moon Bay Airport had a reported market value of $51,300 in 1995. Extrapolating this average value over all aircraft, the estimated market value was $3.4 million.

Owners reported expenditures averaging $5,379 per year on maintenance and operations. Using these values, annual expenditures by owners on maintenance and operations of based aircraft can be estimated as approximately $355,000.

Half Moon Bay Airport
Based Aircraft Profile

- **$51,300 Average Aircraft Value**
- **$5,379 Annual Average Outlays**
- **53 Annual Average Trips**
- **47 Percent Some Business Use**

According to records supplied by the office of the San Mateo County Assessor's Office, aircraft owners paid property taxes of $14,500 in 1995.

Based general aviation aircraft owners reported an average of 53 non-training trips per year, approximating one trip per week.

Eighty nine percent of all general aviation trips were for personal reasons and eleven percent of all trips were for business purposes. However, nearly one half of all owners (47 percent) reported that they used their aircraft for business trips sometime during the year. Of these business users, 20 percent stated that they would suffer a loss of revenues and have to lay off employees if Half Moon Bay airport services were not available.

The airport is a significant factor in determining where aircraft owners live and work. Nearly nine out of ten owners (88%) say that Half Moon Bay airport is " very important" or " important" to their residential location and 50 percent state that the airport is "very important" or "important" to their business location. Only six percent of aircraft owners responded that the airport is not important in determining the location of their residence (see figures).

GENERAL AVIATION VISITORS

Half Moon Bay Airport attracts general aviation visitors from throughout California and the Western United States who come to the area for both business and personal travel. These visitors were surveyed during 1995 to determine such factors as average party size, length of stay and spending patterns for lodging, food, and other goods and services while in San Mateo County

There were 15,000 itinerant general aviation operations at Half Moon Bay Airport in 1995 (see Table 4). Analyzing survey responses, tie down records and information from the airport administration, it was estimated that 50 percent of these itinerant operations could be attributed to "true transient travelers" who originated their trip at a distant home airport. Applying this proportion to Half Moon Bay Airport itinerant operations yields 7,500 true transient operations and 3,750 arriving travel parties in 1995.

Average general aviation travel party size in 1995 was 2.4 persons. Multiplying 3,750 arriving aircraft by 2.4 persons gives 9,000 general aviation visitors in 1995.

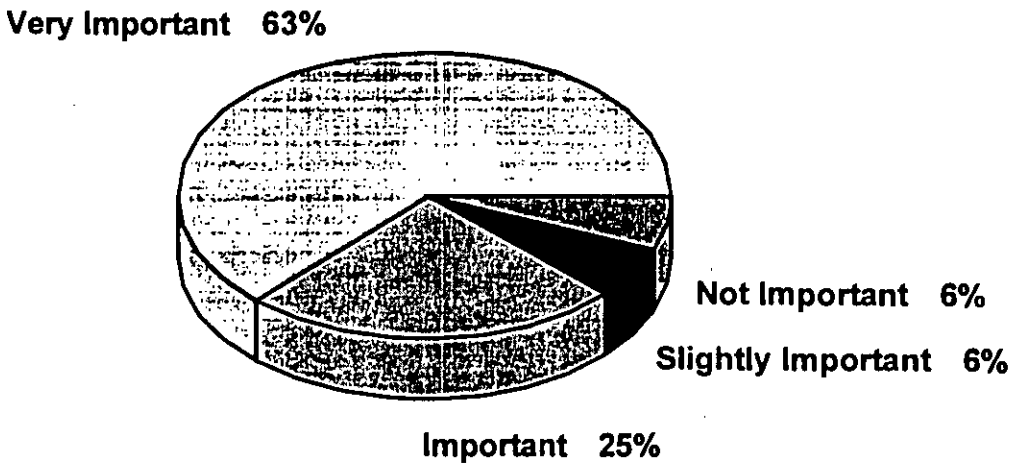
According to the visitor survey, ninety percent of those arriving by itinerant general aviation aircraft recorded no overnight stay, and were in the Half Moon Bay area for just one day. The remaining ten percent of visitors stayed an average of 2.9 days. The weighted average stay is equal to 1.19 days as shown below:

(.90 X 1 Day) + (.10 X 2.9 Days) = 1.19

Multiplying 9,000 general aviation visitors by the 1.19 day average stay yields visitor days of 10,710 in 1995.

Half Moon Bay Airport
Based Aircraft Owner Survey

"Importance of Airport for Residential Location"



"Importance of Airport for Business Location"

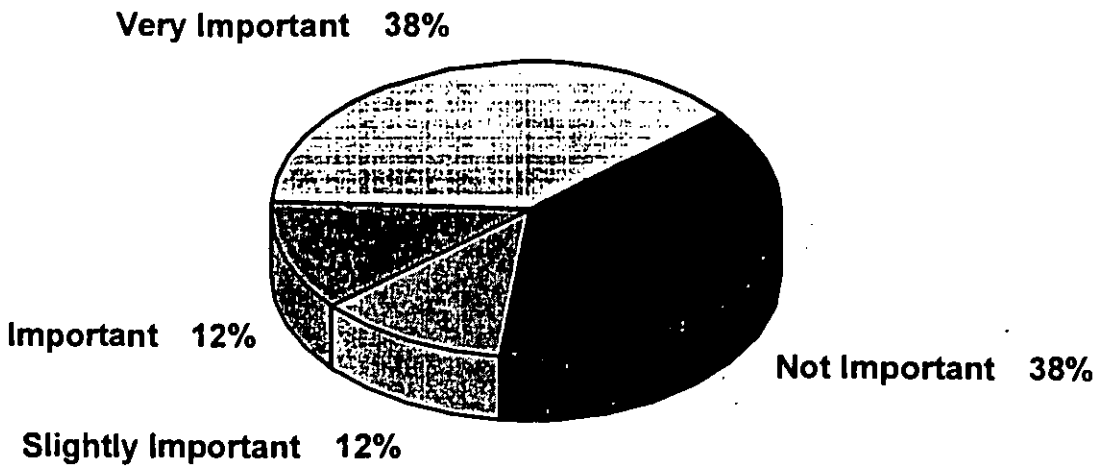


Table 4
Half Moon Bay Airport
General Aviation Visitor Patterns

Itinerant GA Operations	15,000
Transient GA Operations*	7,500
Transient GA Arrivals	3,750
Average GA Passengers	2.4
One-day Aircraft	3,375
One-day Visitors	8,100
Overnight Aircraft	375
Overnight Visitors	900
Overnight Average Stay (days)	2.9
Total GA Visitors	9,000
Average Visitor Stay (days)	1.19
Total GA Visitor Days	10,710

*Based on 50 percent "true transients"

Source: General Aviation Survey, 1995.

Day visitors had no lodging expenses but during their stay each general aviation traveler spent a reported $28 per day for food and beverages in the area. Retail spending was $17 per person per day.

The estimated economic value of each arriving general aviation aircraft carrying travelers who spent the day in the service area but did not stay overnight was $147.

During their one day stay, each aircraft travel party spent $67 on food, $41 on retail, $19 on entertainment, and $20 on ground transport.

Although overnight visitors accounted for only ten percent of all travelers, their spending per person was significantly larger due to expenditures for lodging and a longer stay in the area. The economic value of an arriving general aviation aircraft carrying overnight visitors completing an average 2.9 day stay in the area was $769.

Lodging was the single largest component of spending, averaging $343 for the overnight travel party. During an average overnight stay, each aircraft travel party spent $195 for food, $118 for retail, $54 for entertainment, and $59 for ground transportation.

Overall general aviation visitor spending is the weighted average of day visitors and overnight travel parties (Table 5). General aviation travelers spent a weighted average of $70 per day while visiting the Half Moon Bay area. Food, at $27 per person per day, was the single largest category of daily spending. Overall spending per person per trip was calculated to be $87.

Multiplication of the average expenditures per person per trip ($87) by the average number of persons per aircraft (2.4) yields $208, the weighted average Direct gross revenues injected into the local economy by each arriving itinerant general aviation flight.

Combining the impacts of both day and overnight visitors, each arriving general aviation aircraft represents weighted average lodging expenditures of $33, food outlays of $81, retail spending of $48, entertainment of $22, and ground transportation expenses of $24.

Table 5
Half Moon Bay Airport

Expenditures By General Aviation Visitors

	Expenditures: Person Per Day	Expenditures: Person Per Trip	Expenditures: Aircraft Per Trip
Hotel and Lodging	$11	$14	$33
Food and Beverage	27	34	81
Retail	16	20	48
Entertainment	8	9	22
Transportation	8	10	24
TOTAL	**$70**	**$87**	**$208**

Source: General Aviation Survey, 1995.

Table 6 shows the gross revenues and value added benefits resulting from spending in the region by combined day and overnight visitors arriving at Half Moon Bay Airport in 1995.

Multiplying daily expenditures for each category of spending by the number of visitor days (10,710) yields total outlays for lodging, food and drink, transportation, entertainment, and retail spending due to general aviation visitors during the year.

(Following the Caltrans methodology, retail and entertainment spending have been combined into a "miscellaneous" category in Table 6 to allow for compatibility with Caltrans internal impact coefficients.)

Gross revenues from air visitor spending on goods and services during 1995 summed to $749,700. This figure is important in computing economic benefits since sales and other taxes generated by visitors are based on total revenues.

Expenditures in the food, beverage, and retail spending category were adjusted by retail margin to arrive at an estimate of value added. The hospitality industry is often regarded as a key sector for a region because it is relatively environmentally friendly while providing a high level of value added to the economy. Value added due to spending by general aviation visitors to Half Moon Bay Airport was $531,216 in 1995.

Table 6
Half Moon Bay Airport

Direct Benefits From Air Visitors:
Gross Revenues and Value Added

	Air Traveler Visitor Days	Average Daily Expenditures	Gross Revenues	Value Added
Hotel and Lodging	10,710	$11	$117,810	$117,810
Food and Beverage[1]	10,710	27	289,170	173,502
Transportation	10,710	8	85,680	85,680
Miscellaneous[1]	10,710	24	257,040	154,224
Total		**$70**	**$749,700**	**$531,216**

1. Food and Beverage revenues are adjusted for value added and retail and entertainment categories are combined and adjusted for value added equal to average retail margin, estimated at 60 percent based on reported California averages. "Value Added" column is used with multipliers to compute Induced Impacts.

Visitor revenues from spending on lodging, entertainment, and transportation contribute fully to value added, since the services are produced locally at the time of consumption by visitors.

However, only a portion of food and retail outlays contribute to value added. This is because these goods are typically manufactured in other areas and brought into the region as finished products for resale at a markup.

The food and beverage category contributed the greatest flow of gross revenues, accounting for nearly 40 percent of all gross revenues from visitor spending. Food and beverage spending was also the largest component of value added.

On an average day, there were 29 visitors in the Half Moon Bay area that had arrived by general aviation aircraft. Combined spending per day in 1995 was equal to $2,050 of gross revenues and $1,455 of value added.

The accompanying figure illustrates the distribution of the dollars from air visitor expenditures in the San Mateo County area by spending categories. Each one hundred dollars of visitor spending results in

- $39 spent on food and beverages
- $23 spent on entertainment
- $16 spent on lodging
- $12 spent on ground transportation
- $10 spent on retail outlays

Lodging expenditures reported on the visitor survey were influenced by the large proportion of travelers that stayed in the area for only one day (90%). These visitors incurred no costs for lodging, but typically spent on food, transportation, retail and entertainment.

In addition, many overnight visitors stayed with friends or relatives and reported no outlays for lodging. For those visitors that did stay in a hotel or other lodging facility overnight while in the Half Moon Bay area, average hotel expenditures per trip were $457.

Half Moon Bay Airport

Air Visitor Spending by Category

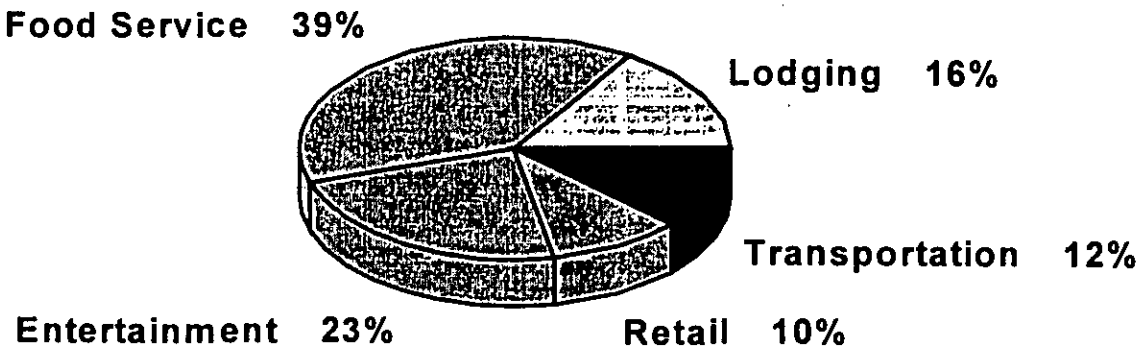


Table 7 presents the benefits of general aviation visitor spending on employment and payroll in the Half Moon Bay Airport service area.

Of the gross revenues of $749,700 created by aviation visitors, $285,422 (an average of 38 cents of each dollar) stayed in the local economy as payroll to employees whose jobs were supported by this spending.

Based on average salaries as shown in Table 7 for each category of spending, an estimated 18 full-time-equivalent jobs in the Half Moon Bay Airport service area were supported by air visitor spending in 1995.

The food and beverage sector accounted for the greatest number of employees (8) with an average annual salary of $12,651 and a payroll of $101,210 for the year 1995. Employment in eating and drinking places accounted for nearly one half of all jobs supported directly by air visitor spending in the Half Moon Bay area.

Air visitor spending created 3 jobs in hotels and lodging and an additional 6 jobs in the combined retail and entertainment sectors. The highest salary paid was in transportation, at $34,272 with one worker. The average salary for all jobs created by visitor spending was $15,857.

Table 7
Half Moon Bay Airport

Direct Benefits From Air Visitors:
Jobs and Payroll

	Gross Revenues	Percent To Labor	Payroll	Average Salary	Number of Jobs
Hotel/Lodging	$117,810	40	$47,124	$15,708	3
Food/Beverage	289,170	35	101,210	12,651	8
Transportation	85,680	40	34,272	34,272	1
Miscellaneous	257,040	40	102,816	17,136	6
Total	**$749,700**		**$285,422**		**18**

Source: *State of California Airport Economic Impact Model*, Caltrans

SUMMARY AND OUTLOOK

Half Moon Bay Airport provides significant economic benefits for its service area. In 1995, airport gross revenues exceeded $2.8 million in spending injected into the local economy. Value added, or net new output associated with the presence of the airport, was $2.3 million, after accounting for all multiplier effects.

Aviation-related activity supported 52 jobs in the service area, with a regional payroll of $1.3 million in 1995.

Economic activity due to on-airport operations created Direct Benefits with gross revenues of $772,220 and value added of $519,410. On-airport employers provided jobs for 12 workers in private businesses and government agencies. The on-airport payroll was $256,000.

Visitors arriving by air contributed to 10,710 visitor days for the year. Spending by air travelers brought gross revenues of $749,700 into the regional economy, creating 18 jobs in tourism and the hospitality industry. Written comments from general aviation visitors arriving at Half Moon Bay Airport suggest that the airport is well-regarded and popular with travelers (see the appendix).

Accounting for all spending and multiplier effects associated with the airport, some $251,000 in tax revenues were generated by the presence of the airport.

THE FUTURE

As general aviation operations at Half Moon Bay Airport grow over time, the economic significance of the Airport will steadily increase. Benefits were estimated for the years 2000 and 2005 by applying projected general aviation traffic growth rates to gross revenues, value added, payroll, and employment.

Benefits for the year 2000 were based on 42,000 projected operations. Estimates for the year 2005 were based on a forecast of 46,000 general aviation operations. Benefit estimates are shown in Tables 8 and 9 in constant 1995 dollars.

In the year 2000, the Total Benefits of Half Moon Bay Airport are estimated at $2.1 million of gross revenues and approximately $1.8 million of value added to the regional economy (Table 8). This estimate includes $339.7 thousand in Direct annual revenues from on-airport operations and $839.2 thousand in air visitor revenues, but does not include capital improvement spending of $500,000 recommended for that year. The airport is projected to support 57 jobs in the local economy in the year 2000.

In the year 2005, when general aviation operations reach 46,000, the Total Benefits of the airport will include gross revenues of $2.3 million and nearly $2 million of value added for the region. Payroll supported by the presence of the airport will exceed $1 million and the airport is forecast to support 61 jobs in the service area (Table 9).

Table 8
Half Moon Bay Airport

Summary of Economic Benefits ($1995): 2000

Category	Gross Revenues	Value Added	Payroll	Employment
Airport Operations*	$339,720	$228,750	$112,470	13
Air Visitors	839,247	595,200	319,000	20
Combined Benefits	**1,178,967**	**823,950**	**431,470**	**33**
Induced Benefits	**957,220**	**957,220**	**501,100**	**24**
TOTAL BENEFITS	**$2,136,187**	**$1,781,170**	**$932,570**	**57**

* Does not include impacts of $500,000 in capital improvement projects for FY 2000.

Note: Revenues, value added, payroll and employment for the year 2000 are based on activity and spending associated with 42,000 general aviation operations.

Table 9
Half Moon Bay Airport

Summary of Economic Benefits ($1995): 2005

Category	Gross Revenues	Value Added	Payroll	Employment
Airport Operations*	$373,360	$251,630	$123,800	14
Air Visitors	922,000	654,720	351,000	22
Combined Benefits	**1,295,360**	**906,350**	**474,800**	**36**
Induced Benefits	**1,052,930**	**1,052,930**	**656,221**	**25**
TOTAL BENEFITS	**$2,348,290**	**$1,959,280**	**$1,131,021**	**61**

*Does not include impacts of $189,520 in capital improvement projects for FY 2005.

Note: Revenues, value added, payroll and employment for the year 2005 are based on activity and spending associated with 46,000 general aviation operations.

NOTES ON METHODOLOGY

AIRPORT BENEFITS

Airports benefit the regional economy through the employment, payroll, and spending associated with aviation activity both on and off the airport. Airports are sources of measurable economic benefits impacting jobs, income, and regional spending levels.

Suppliers of aviation services, such as those private businesses serving general aviation, other airport tenants, and various administrative agencies, all create jobs and value added for the local economy.

Air travelers create economic benefits that extend throughout the region. Visitors who arrive by air generally have greater expenditures for lodging, retail, entertainment, and food, as compared to visitors using other modes of travel.

However, it is important for citizens and policy makers to be aware that airports create significant *unmeasured* social and economic benefits for the regions which they serve. For example, convenient air transportation allows freedom for individuals to travel to satisfy their preferences for goods, services, and personal needs. Airports make the regional economy more competitive by providing businesses ready access to markets, materials and expanded commerce.

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

Studies of factors influencing economic development consistently show that the presence of modern aviation facilities has a positive impact on the pace and quality of economic growth. An efficient airport can provide a competitive edge for communities seeking corporate relocations and expansions. Two out of every three Fortune 500 companies use private aircraft in their business to transport goods and personnel.

In addition to exerting a positive influence on economic development in general, aviation often reduces costs and increases efficiency in individual firms. Companies that operate general aviation aircraft typically record net income as a percent of sales approximately 50 percent greater than companies not utilizing such aircraft.

DATA COLLECTION

Data required for completing the economic benefit study included information on local and itinerant general aviation activity; ownership and use of general aviation aircraft; visitor characteristics; visitor spending and length of stay; the number of employees on the airport; revenues and expenditures of airport employers for wages, supplies and services; tax payments; fuel flowage; and the budget of the airport administration. In all instances, the Airport Division of the San Mateo County Department of Public Works was extremely cooperative and effective in obtaining data or arranging for access to data sources.

The data collection for the economic benefit study involved mail surveys and interview follow-up with both suppliers and users of aviation services. Survey forms are shown in an appendix to this report.

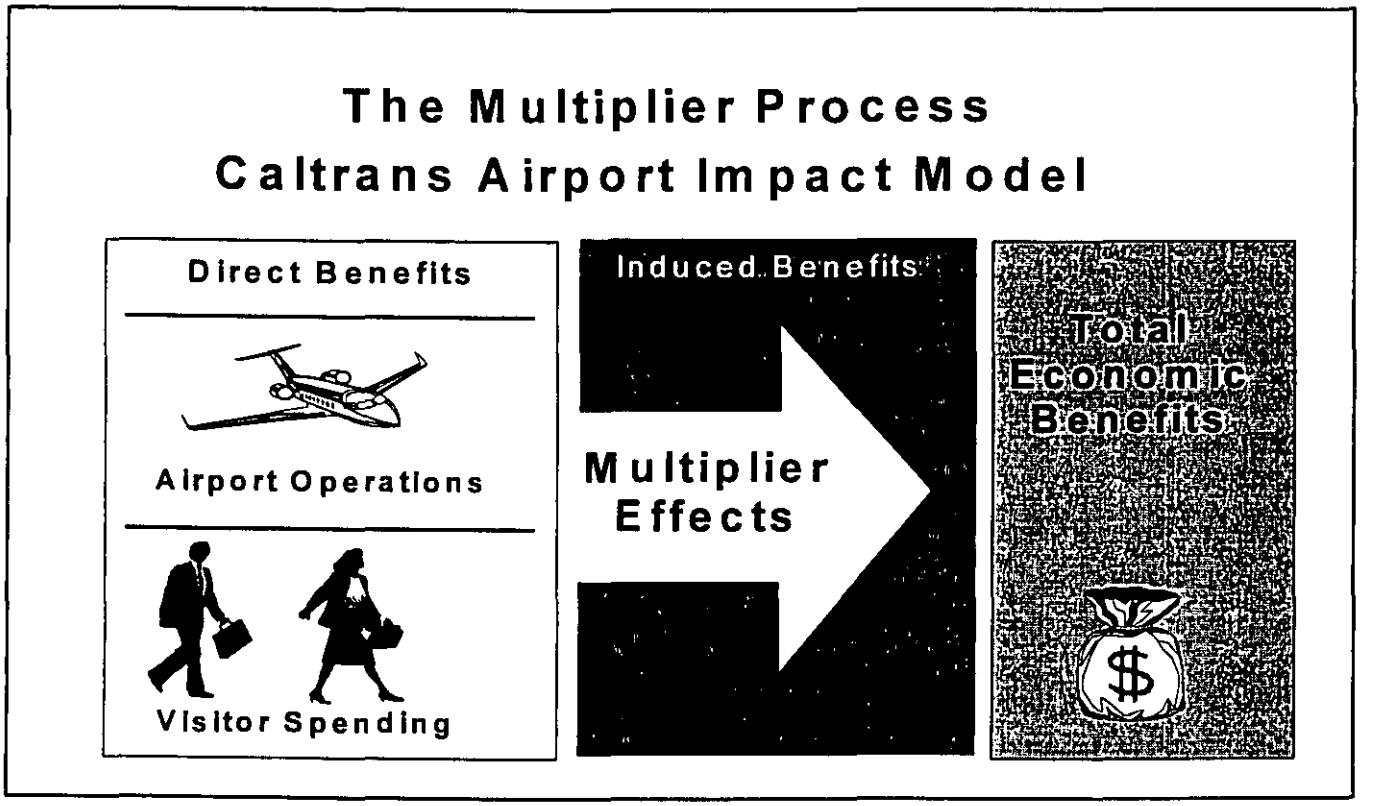
Airport businesses, administrative agencies, and all other tenants received a survey form designed for airport employers. Based aircraft owners were surveyed using a mailing list from the Airports Division of the Department of Public Works.

Visitors arriving by general aviation aircraft were contacted by mail. Survey forms were sent to addresses obtained from FAA data bases using tail number logs maintained by Airport staff. Separate samples were compiled for overnight and day visitors.

Responses from the surveys were tabulated and analyzed following the methodology as recommended by the FAA in *Estimating the Regional Significance of Airports*, published in September, 1992, and available from the National Technical Information Service as publication DOT/FAA/PP-92-6.

The FAA methodology has been incorporated into a computer based model with specific California coefficients, which provided the computational framework for calculating economic benefits in this study. The software and guidelines used are available as the *State of California Airport Economic Impact Model* developed by the Division of Aeronautics of the California Department of Transportation.

The Caltrans model computes Total Economic Benefits as the sum of (a) Direct Benefits of airport operations and visitor spending plus (b) Induced Benefits from multiplier effects, as illustrated below.



APPENDICES

HALF MOON BAY AIRPORT

ECONOMIC BENEFIT STUDY

COMMENTS BY VISITORS

SURVEY FORMS

VERBATIM COMMENTS

HALF MOON BAY GENERAL AVIATION VISITORS

Half Moon Bay is one of our favorite destinations. We go there several times a year. It would be helpful if Half Moon Bay had an ILS approach, an NDB, or some sort of instrument approach. It is a very nice airport in a very nice area.

We would land in San Carlos if not for the easy walking access to the B&B's and harbor restaurant areas south east of the airport. Sometimes we stay in adjacent B&B's during visits to family.

I use the Half Moon Bay airport for pilot training. If the restaurant on the airport is open I will have a cup of coffee. Half Moon Bay airport is an excellent training facility; as an uncontrolled airport; as a reliever airport for San Carlos and Palo Alto airports; as a destination for nearby restaurants.

Car rental is a big problem when I land at Half Moon Bay airport.

Half Moon Bay is one of our favorite fly-in places for a meal and a walk by the sea. We are limited to the immediate area around the airport. If there were a shuttle to Half Moon Bay or the shopping areas we would branch out and explore.

Please remove the fog!

Prompt, efficient service. Good restaurant, reasonable overnight fee. Best small airport in Northern California.

Love your sun!

The personnel and services at the airport were outstanding!

Less expensive travel options between the airport and town would be appreciated.

Excellent airport.

It would be good to have an IFR approach.

Keep up the good work. It was pleasant.

HALF MOON BAY AIRPORT GENERAL AVIATION VISITOR SURVEY

San Mateo County appreciates your interest in the Half Moon Bay area. Completion of this ***confidential*** *questionnaire will assist us in providing the best service possible for general aviation visitors. Please return the survey in the envelope provided. If you have questions regarding this survey, please call me at 415 - 573 - 3700.*

Gary Petersen
Airport Manager
Half Moon Bay Airport

1. Where is your **residence?** City _____ State _____

2. What was the **main purpose** of your most recent trip to the Half Moon Bay area?

   a. Convention _____ b. Business _____ c. Personal _____

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

4. How many **NIGHTS** were you away from your primary residence on this trip?

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

5. Where was your **primary destination** for this trip?

   Half Moon Bay ____ OR Another city (specify) _____

6. Please estimate **spending by your ENTIRE TRAVEL PARTY** during your **TOTAL STAY** on your most recent visit. Circle the closest figure.

   Hotel/Lodging:
   None $100 200 400 600 800 1000 1250 1500 1750 2000 2500 3000 or more (specify) _____
   Restaurant Food and Drink:
   None $25 50 75 100 150 200 250 300 400 500 600 700 800 900 or more (specify) _____
   Retail Spending for Goods and Services (but not entertainment):
   None $25 50 75 100 150 200 250 300 400 500 600 700 800 900 or more (specify) _____
   Entertainment (Golf, Movies, etc.):
   None $25 50 75 100 150 200 250 300 400 500 600 700 800 900 or more (specify) _____
   Ground Transportation Including Auto Rental:
   None $25 50 75 100 150 200 250 300 400 500 600 700 800 900 or more (specify) _____

7. If Half Moon Bay Airport was not available, would you still have visited this area?

   Definitely Yes _____ Probably Yes _____ Unlikely _____ Definitely Not _____

8. Please use the reverse side to provide comments or suggestions about services and facilities at Half Moon Bay Airport.

HALF MOON BAY AIRPORT ECONOMIC BENEFIT STUDY

To All Airport Businesses:

As part of the Master Plan, we are preparing an Economic Benefit Study for Half Moon Bay Airport. In order to compile meaningful economic data about the airport, your cooperation is very much needed. This survey will be handled with the ***strictest confidentiality*** *and only aggregate numbers will be used in publishing the data. You may return the survey directly to our consultant in the envelope provided. Your cooperation is sincerely appreciated and please do not hesitate to contact me at 573 - 3700, should you have any questions. Thank you for your participation in this important effort.*

Gary Petersen
Airport Manager
Half Moon Bay Airport

1. Please describe your **main business activity** (FBO, car rental, etc.).

   _____

2. How many **employees** does your business have? (Please combine part time employees and convert to full time equivalent.) _____

3. Please estimate **annual payroll** and benefits $ _____

4. Please estimate **all other outlays** for materials, services $ _____

5. Please estimate **annual gross revenues** for your business (at this location only):

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

   b. OR mark appropriate range on scale below:

$0 50 75 100 200 400 500 750 1 2 5 10
(Thousand) (Million)

Thank You For Your Participation

HALF MOON BAY AIRPORT AIRCRAFT OWNER SURVEY

As part of the Master Plan, we are preparing an Economic Benefit Study for Half Moon Bay Airport. In order to compile meaningful economic data about the airport, your cooperation is very much needed. This survey will be handled with the ***strictest confidentiality*** *and only aggregate numbers will be used in publishing the data. You may return the survey in the envelope provided. Your cooperation is very much appreciated and please contact me at 573 - 7300, should you have any questions. Thank you for your participation.*

Gary Petersen
Airport Manager
Half Moon Bay Airport

1. How many aircraft do you have based at Half Moon Bay Airport? _____

2. Please estimate the market value of your aircraft. _____

3. Please estimate your annual outlays for fuel, maintenance, and other expenses associated with your aircraft. _____

4. Please estimate the annual number of (non- training) trips in your aircraft.

Business _____ Personal _____

5. Considering the location of your personal residence, how important is the airport as a factor determining where you have decided to live?

Very Important ___ Important ___ Slightly Important ___ Not Important ___

6. Considering the location of your business or employment, how important is the airport as a factor determining the location of this business?

Very Important ___ Important ___ Slightly Important ___ Not Important ___

7. Considering your business or employment, what would be the effect on your business/employment if this airport was not available?

A. Lay off employees (estimate number) _____
B. Loss of revenues (estimate dollar amount) _____
C. My business/employment would close or relocate _____
D. Airport has no effect on my business/employment _____

Please Use Other Side For Comments or Suggestions About Airport

SAN MATEO COUNTY
AIRPORTS
HALF MOON BAY

Appendix C
AIRPORT DEVELOPMENT ALTERNATIVE D

Appendix C
AIRPORT DEVELOPMENT ALTERNATIVE D

At the time the *Draft Half Moon Bay Airport Master Plan* document was taken before the San Mateo County Board of Supervisors, the Midcoast Community Council proposed a fourth alternative. Illustrated on **Exhibit C1, Airport Development Alternative D**, this alternative represents a scaled down version of the three previously presented alternatives. This alternative is distinguished from the other alternatives because (1) it retains the displaced thresholds, (2) it eliminates the provision of a parallel taxiway, and (3) it eliminates any commercial/industrial or aviation-related development on the north end of the airport.

At their July 22, 1997 hearing on the Draft Half Moon Bay Airport Master Plan, the San Mateo County Board of Supervisors indicated that Alternative D should be evaluated as part of the environmental review process required under the *California Environmental Quality Act*.

In their letter to the Board of Supervisors, the Midcoast Community Council indicated that the displaced thresholds have served the airport well for at least 20 years and that the resulting available runway length, 4,237 feet for landing and 5,000 feet for departure, is 60 percent greater than that currently available at San Carlos Airport. They further expressed concern that eliminating the displaced threshold would require changes to the County's Airport Land Use Plan and push the Approach Protection Zone 763 feet further into Princeton-by-the-Sea. They expressed concern that this would preclude the development of a significant number of parcels that are important to the community's tax base. The further expressed concern that removal of the displaced thresholds would increase noise impacts on the surrounding community.

Regarding the parallel taxiway improvements, the Midcoast Community Council expressed concern that the cost for the improvements outweighed the "demonstrated need and possible benefits." They noted that by removing the port-a-ports and midfield T-hangars, the conflict between aircraft and automobiles on the existing taxiway has been eliminated. They also indicated that, in their opinion, the parallel taxiway would benefit just a small percentage of total operations at the airport.

Rather than construct a new helicopter landing area, the Midcoast Community Council recommends utilizing an existing taxiway stub already in place. These stubs are located throughout the landside area, many are currently occupied by a port-a-port. The Midcoast Community Council further noted that "helicopter operations are among the most noisy and disliked uses of Half Moon Bay airport, and the community does not wish to encourage regular or frequent helicopter operations, or welcome use of Half Moon Bay for helicopter pilot training, by providing extensive support facilities."

Finally, regarding the conventional hangars, the Midcoast Community Council believes these should be developed under private initiative and with private funding.

The Midcoast Community Council estimated the cost of Alternative D as follows. The estimated costs for Alternative B, as recommended in Chapter Four, is also included for comparison purposes.

95MP01-C1-12-16-97

LEGEND:

1. CONVENTIONAL HANGAR
2. T-HANGAR
3. T-HANGAR EXPANSION AREA
4. AUTO PARKING
5. COMMERCIAL/INDUSTRIAL DEVELOPMENT AREA
6. RECREATIONAL AIRCRAFT PARKING

AIRPORT PROPERTY LINE

NOTE: ALL PORT-A-PORTS AND THE T-HANGAR AT MIDFIELD ARE ULTIMATELY TO BE REMOVED AND THEREFORE ARE NOT SHOWN FOR CLARITY.

MOSS BEACH

SAN VICENTE CREEK

DENNISTON CREEK

BRIDGEPORT DR.

CORAL REEF

SONORA AVE.

ETHELDORE ST.

CABRILLO HIGHWAY

ACCESS ROAD

CAPISTRANO

ULT. REIL

ULT. PAPI-2

ULT. ASOS

EXIST. DISPLACED THRESHOLD TO BE RETAINED

EXISTING DEPARTURE RPZ 250' X 1000' X 450' VISIBILITY NOT LESS THAN ONE MILE (TYP. - EACH END)

Exist. VASI-4

EXIST. 5000' X 150' RUNWAY

ULT. PAPI-2

CALIFORNIA AVE.

CORNELL

MARINE BLVD.

CYPRESS AVE.

AIRPORT ST.

PRINCETON

EXISTING APPROACH RPZ 250' X 1000' X 450' VISIBILITY NOT LESS THAN ONE MILE (TYP. - EACH END)

EXIST. DISPLACED THRESHOLD TO BE RETAINED

REDONDO PARK

BEACH WAY

LOS BANOS AVE.

BERNAL AVE.

OCEAN BLVD.

DERECHO ST.

LA GRANADA

CULEBRA ST.

BARRANCA ST.

STANFORD

POINT AVE.

WEST

HALF MOON BAY

NORTH

0 600 1200

SCALE IN FEET

PACIFIC OCEAN

JAMES V. FITZGERALD MARINE RESERVE

HALF MOON BAY AIRPORT

Exhibit C1
AIRPORT DEVELOPMENT ALTERNATIVE D

TABLE C1
Airport Development Cost Comparison
Half Moon Bay Airport

Item	Alternative B[1]	Alternative D[2]
Taxiway Extension	$656,300	$0
Run-up Areas	$48,000	$48,000
Connector Taxiways	$249,200	$100,000
Relocate Threshold Lights	$30,000	$0
Relocate REILs	$10,000	$0
PAPIs	$60,000	$0
ASOS	$150,000	$150,000
MITLs	$326,000	$200,000
Runway Markings	$40,000	$10,000
Heliport	$75,000	$1,000
Utility System Upgrades	$250,000	$175,000
T-Hangars	$1,120,000	$800,000
Conventional Hangars	$3,937,500	$0
Recreational Aircraft Tiedowns	$65,000	$65,000
Access Roads	$525,000	$250,000
Automobile Parking	$118,100	$82,000
TOTAL	**$7,660,100**	**$1,881,000**

Notes: [1] Cost estimates include an additional 25% for engineering and contingency.
[2] Cost estimate for Alternative D provided by Midcoast Community Council.

SAN MATEO COUNTY
AIRPORTS
HALF MOON BAY

Appendix D
PLANNING ADVISORY COMMITTEE

HALF MOON BAY AIRPORT MASTER PLAN PLANNING ADVISORY COMMITTEE (PAC)			
Name and Title	Representing	Address	Phone/Fax Number
Mr. Gary E. Petersen Airport Manager	Half Moon Bay Airport	620 Airport Drive San Carlos, CA 94070	415-573-3700 415-593-3762 f
Mr. Mark Larson Airport Operations	Half Moon Bay Airport	620 Airport Drive San Carlos, CA 94070	415-573-3700 415-593-3762 f
Mr. David F. Carbone Airport Planner	County of San Mateo Environmental Services Agency	590 Hamilton Street Second Floor Redwood City, CA 94063	415-363-4417 415-363-4849 f
Mr. Elisha Novak, Ph.D. Airport Planner	FAA - San Francisco ADO	831 Mitten Road Burlingame, CA 94010-1303	415-876-2928 415-876-2733 f
Mr. Dan Gargas Sr. Aviation Consultant	CALTRANS Aeronautics	P. O. Box 942873 Sacramento, CA 94273-0001	916-322-9950 916-327-9093 f
Mr. David Dietz Planner	San Francisco International Airport	P. O. Box 8097 San Francisco, CA 94128	415-737-7701 415-876-2531 f
Ms. Mary Griffin Supervisor	County Board of Supervisors	401 Marshall Street Redwood City, CA 94063	415-780-7000 415-780-4225 f
Mr. Steve Hayes	Mid-Coast Council	71 Bernal, Moss Beach, CA 94038 Moss Beach, CA 94038	
Mr. Chris McComb	Mid-Coast Council	P. O. Box 858 Moss Beach, CA 94038	
Mr. Frank Sylvestri	West Coast Aviation	Route 1 Box 43 Half Moon Bay, CA 94019	415-728-3323

HALF MOON BAY AIRPORT MASTER PLAN PLANNING ADVISORY COMMITTEE (PAC)			
Name and Title	Representing	Address	Phone/Fax Number
Mr. Mark Roddin	Metropolitan Transportation Commission	101 8th Street Oakland, CA 94607-4700	510-464-7827 510-464-7848 f
Mr. Joe Reid	Half Moon Bay Pilot's Association	323 Miramontes Avenue, Half Moon Bay, CA 94019	415-726-3417 415-321-8095 f
Mr. Brian Favarro	Airport Tenant	323 Poplar Street Half Moon Bay, CA 94019	415-726-3648
Mr. Eddie Andreinni President	Half Moon Bay Pilot's Association	151 Main Street, Half Moon Bay, CA 94019	415-726-2065 415-726-7929 f
Mr. Bob Senz	Ocean Shore Company	111 Main Street, Half Moon Bay, CA 94019	415-726-5505 415-726-7525
Ms. Naomi Patridge Mayor	City of Half Moon Bay	P. O. Box 338 Half Moon Bay, CA 94019	415-726-8270 415-712-7205 hs 415-726-9389
Ms. Janet Reid	Airport Tenant	P.O. Box 1392 Elgrande, CA 94018	415-726-2965
Mr. Jay White President	California Pilot's Association	P. O. Box 1148 Redwood City, CA 94064	415-594-9300 415-366-1915 f

KANSAS CITY
(816) 524-3500

237 N.W. Blue Parkway
Suite 100
Lee's Summit, MO 64063

PHOENIX
(602) 993-6999

11022 N. 28th Drive
Suite 240
Phoenix, AZ 85029