McCLELLAN-PALOMAR AIRPORT

AIRPORT MASTER PLAN

County of San Diego
Department of Public Works
Division of Airports

AIRPORT MASTER PLAN

FOR

McCLELLAN-PALOMAR AIRPORT
Carlsbad, California

Prepared For:

County of San Diego
Department of Public Works
Division of Airports

By:
Coffman Associates, Inc.

December 1997

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This document was approved and accepted by the San Diego County Board of Supervisors on September 16, 1997.

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Carlsbad, California

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McCLELLAN-PALOMAR
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INTRODUCTION

INTRODUCTION

The McClellan-Palomar Airport Master Plan is being financed as a cooperative effort between the Federal Aviation Administration (FAA) and the County of San Diego, Department of Public Works, Airports Division. 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 McClellan-Palomar 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 Diego 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, McClellan-Palomar Airport will continue its role as both an economic asset and a source of pride to the residents of the City of Carlsbad and the County of San Diego.

AIRPORT USERS

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 and Necessity issued by the DOT. Certain non-scheduled or charter operations may also be conducted by these carriers, all passenger carriers, and combination carriers operating under Federal Aviation Regulation (FAR) Part 121 certificates.

- **Air Taxi or Commercial Operators** - Operators of airplanes with a 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:

- **Inventory of Existing Conditions** - Assemble and organize relevant information and data on McClellan-Palomar Airport and the surrounding area.

- **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.

- **Economic Benefit Analysis** - Prepare a economic benefit analysis which evaluates the direct and indirect economic benefits of the McClellan-Palomar Airport.

- **Environmental Review** - Prepare a overview of various environmental factors associated with the future airport development.

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 Technical Advisory Committee (TAC), which reviews the work of the study team. In addition, two 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 McClellan-Palomar Airport will reflect the necessary future development needed to meet the growing aviation demands of both the community and the region.

THE AIRPORT'S ROLE

The McClellan-Palomar Airport is classified in the **National Plan of Integrated Airport Systems, 1990-1999**, as a Primary Airport. Primary Airports are defined as those having more than 10,000 annual passenger enplanements (boardings).

This Master Plan study will examine and consider all of the activities currently taking place at McClellan-Palomar Airport and strive to produce a plan that will support all airport users, and meet the needs of the community.

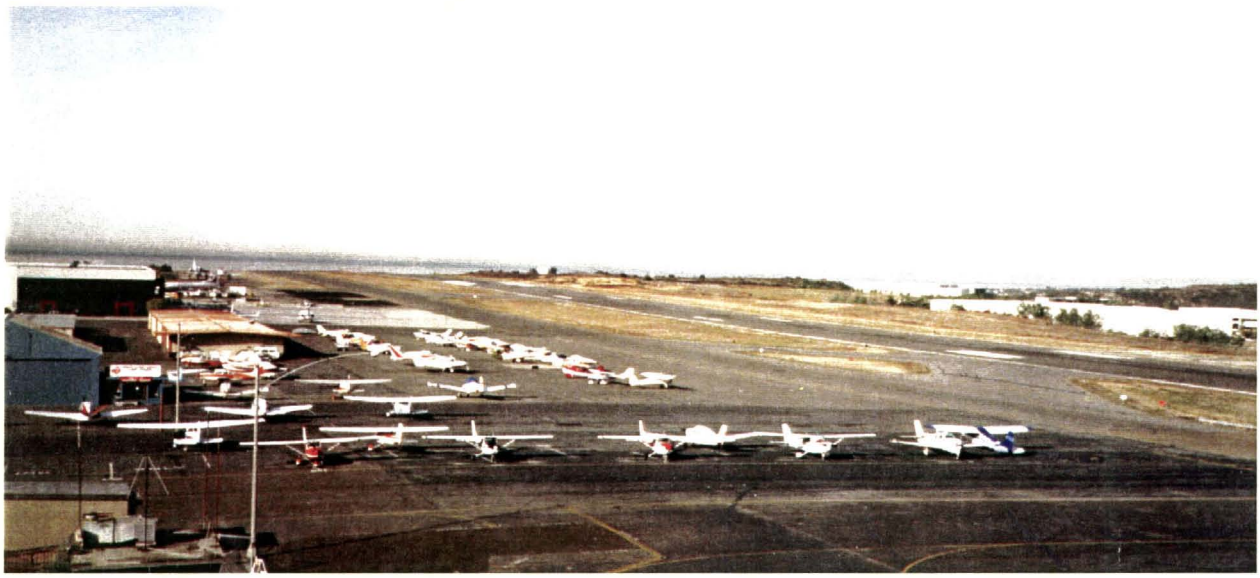
McCLELLAN-PALOMAR
A·I·R·P·O·R·T

Chapter One
INVENTORY

Chapter One

McCLELLAN-PALOMAR AIRPORT

INVENTORY



The development of a Master Plan for McClellan-Palomar Airport required the collection and evaluation of various data related to the airport, the community, and the surrounding area. This information included the following.

- Physical inventories and descriptions of facilities available and services provided at the airport.
- Background information pertaining to the airport, the City of Carlsbad, and the County of San Diego.
- Population and other socioeconomic statistics which might provide an indication of future development in the County of San Diego.
- A comprehensive review of the existing local and regional plans and studies to determine their potential influence on the development and implementation of the Airport Mater Plan.

An accurate and complete inventory is essential to the success of a master plan study. The conclusions, findings and recommendations made in the master plan are dependent on the information collected during the study. Therefore, the data concerning conditions on and around the airport must be as reliable and current as possible.

The information acquired during the inventory phase was obtained through on-site investigations of the airport, and interviews with airport management and representatives from the City of Carlsbad and the County of San Diego. Information was also obtained from historical records and available documents and studies concerning the local communities and the airport.

Department of Public Works, Airport Division, and is located within the city limits of the City of Carlsbad. The airport, located approximately 35 miles northwest of San Diego, 8 miles southeast of Oceanside, 5 miles west of San Marcos, and 6 miles southwest of Vista, is accessible from Interstate 5 via Palomar Airport Road. **Exhibit 1A, Airport Setting**, locates the airport within the regional setting.

The airport manager is responsible for the daily operations of McClellan-Palomar Airport and reports to the County of San Diego Assistant Deputy Director of Airports. An administrative staff of eight, (an assistant airport manager/noise abatement officer; an administrative secretary; maintenance worker I; two (2) airport interns, one student worker; and a real properties agent), oversee the daily operation of McClellan-Palomar Airport.

AIRPORT DEVELOPMENT HISTORY

In 1957, the current airport site was selected to replace Del Mar Airport. In 1959, construction was completed on a 3,700 foot long, 100 foot wide runway (Runway 6-24) at what is now the McClellan-Palomar Airport.

During the 1960's, the terminal building was constructed, Runway 6-24 was extended to 4,700 foot in length and widened to 150 feet, and runway lighting was installed.

In 1973, the FAA installed and currently operates an Air Traffic Control Tower (ATCT) at the airport. An Instrument Landing System (ILS) and approach lighting system was installed on Runway 24 in 1977.

During the 1990's, high intensity approach lights were installed on Runway 24 and airport perimeter fencing was installed.

Currently, the County is in the process of installing a permanent noise monitoring system at the airport. This system will be used in conjunction with noise abatement procedures to minimize aircraft noise on the surrounding communities.

HISTORICAL AIR TRAFFIC ACTIVITY

Air traffic statistics at McClellan-Palomar Airport are recorded by the airport management staff from information supplied by the Federal Aviation Administration (FAA) air traffic control tower (ATCT) staff. ATCT personnel at the airport collect and report aircraft operations (takeoffs and landings). Annual operations reached a peak in 1990 at 254,061 and have fluctuated over the last three years with a total of 217,739 operations recorded in 1993. **Table 1A, Airport Operations/ Enplanement Data**, and **Exhibit 1B, Aircraft Operations Summary**, present a summary of operational figures since 1980.

The airport management staff also collects and records data concerning commercial passenger activity at the airport. Between 1991 and 1993, when American Eagle initiated service, enplanement levels at McClellan-Palomar Airport have nearly doubled from 7,561 to 14,455. **Table 1A, Airport Operations/Enplanement Data**, presents the total enplanements since 1980. **Table 1B, Monthly Passenger Enplanements (1991-1993)**, presents a month-by-month breakdown of total passenger enplanements for the airport since the startup of airline activity at the airport. In addition, **Exhibit 1C, Monthly Operations and Enplanement Distribution (1993)**, illustrates the monthly enplanement distribution for 1993.

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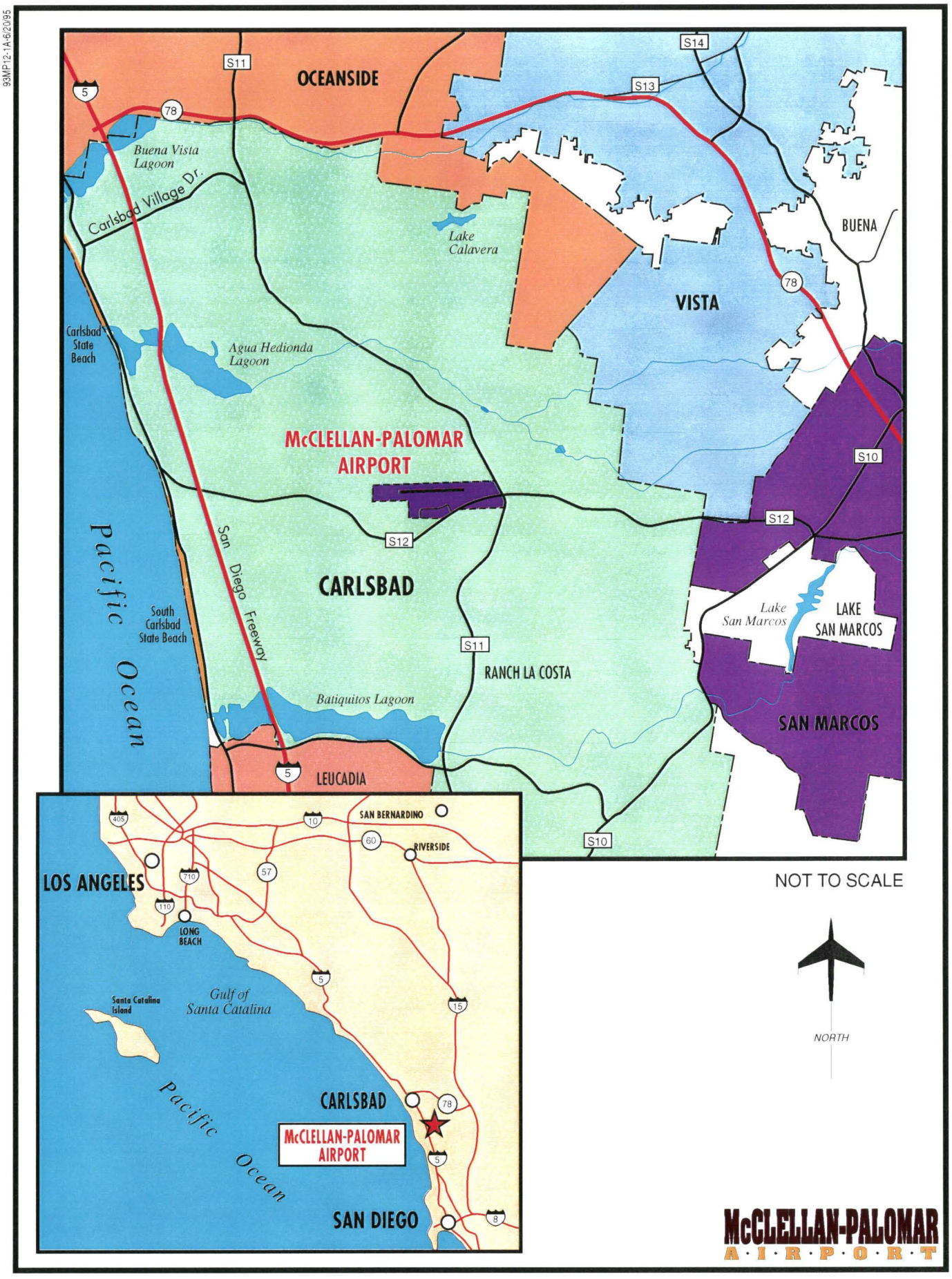

Exhibit 1A
AIRPORT SETTING

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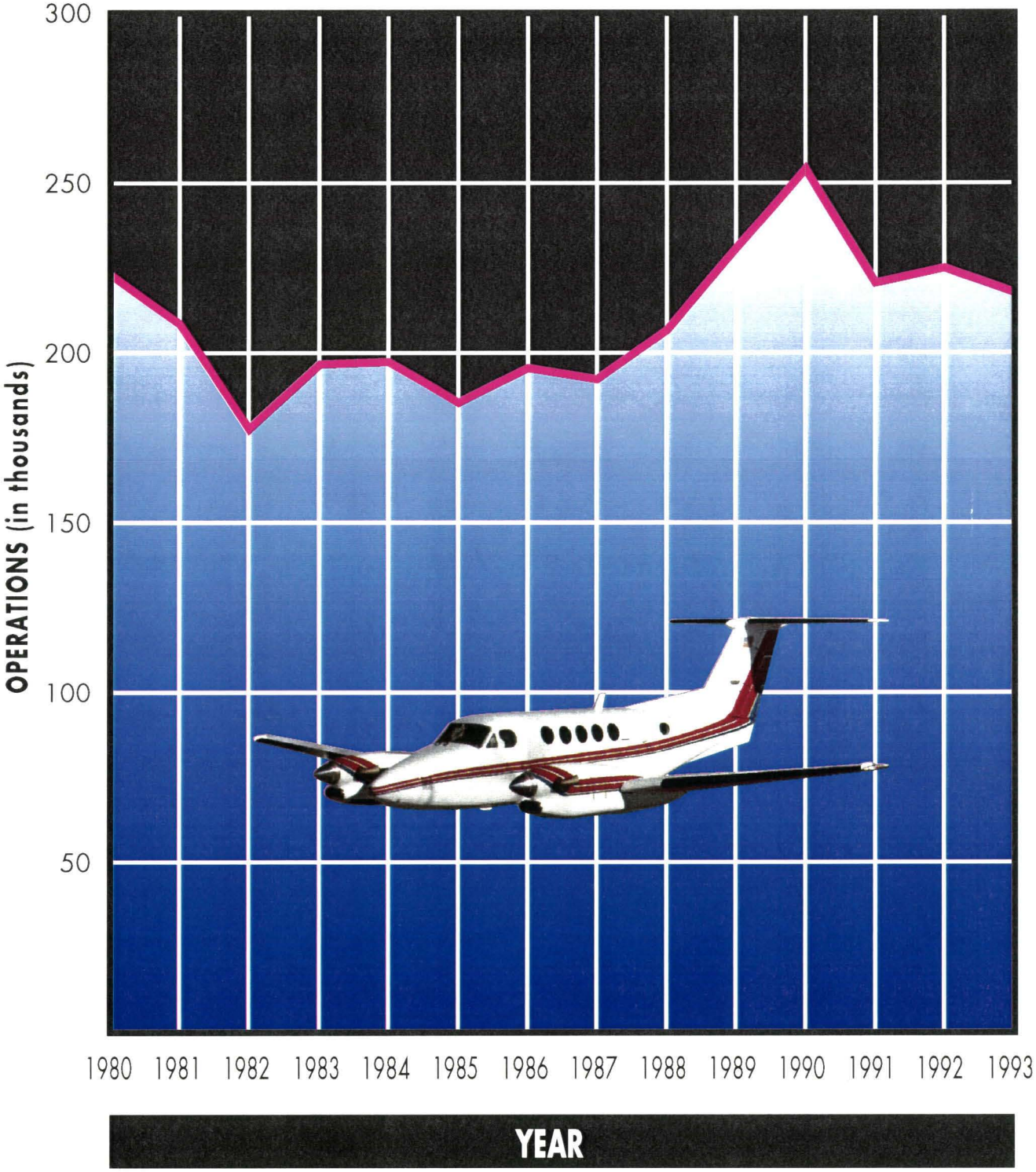
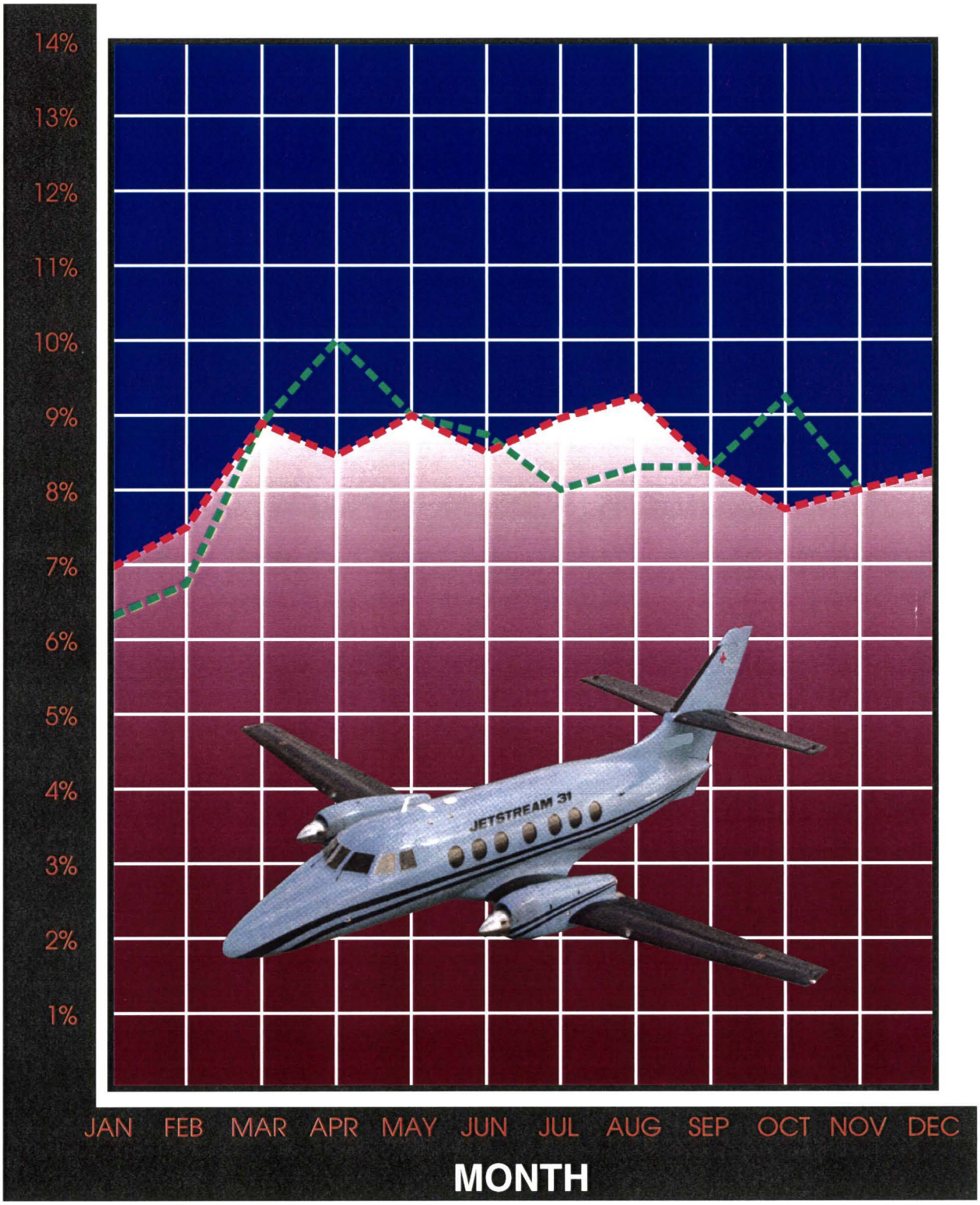
AIRCRAFT OPERATIONS (1980-1993)



McCLELLAN-PALOMAR AIRPORT

Exhibit 1B
AIRPORT OPERATIONS SUMMARY



LEGEND :

Total Enplanements

Total Operations

McCLELLAN-PALOMAR AIRPORT

Exhibit 1C
MONTHLY OPERATIONS AND ENPLANEMENTS
DISTRIBUTION (1993)

TABLE 1A
Airport Operations/Enplanement Data
McClellan-Palomar Airport

Year	Annual Operations	Annual Passenger Enplanements
1980	222,970	0
1981	208,534	0
1982	177,596	0
1983	196,622	0
1984	197,290	0
1985	185,270	0
1986	195,538	0
1987	192,225	0
1988	206,692	0
1989	230,744	0
1990	254,061	0
1991	220,621	7,561
1992	225,041	11,090
1993	217,739	14,455

Sources: McClellan-Palomar ATCT records and the Airport Administration Staff

TABLE 1B
Monthly Passenger Enplanements (1991-1993)
McClellan-Palomar Airport

Month	1991	1992	1993	1993 Percentage
January	0	692	902	6.24%
February	0	706	970	6.71%
March	0	901	1,293	8.95%
April	533	850	1,444	9.99%
May	882	847	1,323	9.15%
June	817	700	1,253	8.67%
July	887	1,097	1,160	8.03%
August	934	1,183	1,210	8.37%
September	882	1,011	1,200	8.30%
October	895	1,032	1,342	9.28%
November	929	1,070	1,158	8.01%
December	802	1,001	1,200	8.30%
Total	7,561	11,090	14,455	100%

Source: Airport Administration

EXISTING AIRPORT FACILITIES

An airport can be divided into three distinct areas: airside, landside, and support. The airfield area consists of the parts of the airport which accommodate the movement of aircraft. This also includes the navigational and communication equipment designed to facilitate aircraft operations. Landside facilities include terminal facilities, hangars, and other structural development as well as areas for the movement and parking of vehicles. Airport support facilities include those for utility delivery, aircraft rescue and firefighting, and airport operations and maintenance. Each of these three areas are further described in the following sections.

AIRFIELD FACILITIES

The airfield facilities at McClellan-Palomar Airport include the runway, taxiways, aprons, and airfield lighting. The airfield facilities section also include a discussion of navigational and communication aids serving the airport. In addition, **Exhibit 1D, Existing Facilities**, illustrates the location of airside facilities.

Runway 6-24

McClellan-Palomar Airport, situated at an elevation of 328 feet mean sea level (MSL), consists of one runway which is oriented east-west and designated as Runway 6-24. Runway 6-24 is 4,700 feet long and 150 feet wide. According to the March 1994 Department of Commerce/National Oceanic and Atmospheric Administration (DOC/NOAA) Airport/Facility Directory, the runway has a strength rating of 60,000 pounds single-wheel loading (SWL), 80,000 pounds dual-wheel loading (DWL), and 110,000 pounds dual-tandem wheel loading (DTWL). The runway is constructed of asphalt and has a porous friction course (PFC) overlay. The runway has an effective runway gradient of 0.31 percent sloping down to the east. **Table 1C, Runway Data**, presents a summary of facility data for Runway 6-24.

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LEGEND:

1. Administration/Terminal Building
2. Air Traffic Control Tower (ATCT)
3. American Eagle Facility
4. Fuel Storage
5. Cinema Air Jet Center
6. Gibbs Aviation Services, Inc.
7. Western Flight
8. Speciality Shops

Airport Property Line

McCLELLAN-PALOMAR AIRPORT

Exhibit 1D
EXISTING FACILITIES

TABLE 1C Runway Data McClellan-Palomar Airport	RUNWAY	
	6	24
Length (ft)	4,700	
Width (ft)	150	
Surface Material	Asphalt	
Surface Treatment	Porous Friction Course (PFC)	
Pavement Strength		
Single Wheel Loading (lbs)	60,000	
Dual Wheel Loading (lbs)	80,000	
Dual Tandem Wheel Loading (lbs)	110,000	
Navigational Approach Aids		
Instrument Landing System (ILS)	No	CAT-I
Visual Approach Slope Indicator (VASI)	VASI-2	VASI-4
Runway End Identifier Lights (REIL)	No	Yes
Very High Frequency Omnidirectional Range (VOR)	No	Yes
Non-Directional Beacon (NDB)	No	Yes
Medium Approach Lighting System (MALSR)	No	Yes
Approach Slope (horizontal:vertical)	20:1	50:1
Lighting	High Intensity Runway Lighting (HIRL)	
Marking	Visual	Precision
Source: DOC/NOAA Airport/Facility Directory, dated March 3, 1994		

Taxiways

The existing taxiway system consists of one full-length parallel taxiway and five exit/connecting taxiways. The full-length parallel taxiway is 75 feet in width. At the approach end of Runway 24, an aircraft holding area is incorporated with the parallel taxiway. Three high-speed exits are provided off the runway, one for Runway 6 and two for Runway 24. The two remaining taxiways provide connections between the parallel taxiway and the runway at the runway ends.

Lighting and Marking

A variety of lighting and marking aids are available at McClellan-Palomar Airport to

facilitate airport identification, approaches and landings both at night and during adverse weather conditions. These systems are categorized by function and are further described in the following paragraphs.

Identification Lighting

The location and presence of an airport at night is universally indicated by an airport beacon equipped with an optical system that projects two beams of light, one green and one white. At McClellan-Palomar Airport the airport beacon is located on the southwest side of the airport.

The airport is equipped with four windcones, one lighted windcone incorporated with the segmented circle on the north side of the runway, two non-lighted windcones at the runway ends, and one non-lighted windcone at mid-field.

Runway and Taxiway Lighting

Runway 6-24 is equipped with High Intensity Runway Lighting (HIRL) which outline the runway with white lights. In addition, threshold lighting is installed to identify the ends of the runway. The parallel taxiway and all connecting taxiways are equipped with Medium Intensity Taxiway Lighting (MITL) which outline the taxiways with blue lights.

Approach Lighting

Runway 6 is equipped with a two-box Visual Approach Slope Indicator (VASI-2) on the left side of the runway end. Runway 24, however, is equipped with a VASI-4 (four-box VASI system). These systems consist of two-color, high intensity lights, focused at predetermined angles (Runway 6 at 3.0 degrees and Runway 24 at 3.2 degrees) to provide visual decent guidance information to the pilot during the final approach to the runway.

The approach end of Runway 24 is equipped with a Medium Intensity Approach Lighting System with runway alignment indicator lights (MALSR). The MALSR system provides visual guidance to landing aircraft by radiating light beams in a directional pattern by which the pilot aligns the aircraft with the extended centerline of the runway.

Runway 24 is also equipped with Runway End Identifier Lights (REILs). REILs are high intensity strobe lights that provide the pilot with a positive identification of the runway threshold. These lights are particularly useful during periods of low visibility or at night.

Pavement Markings

Pavement markings are used on runway and taxiway surfaces to identify a specific runway, runway threshold, a centerline, a holdline, etc. Runways are marked with white markings in accordance with the approach type available to each runway end. At McClellan-Palomar Airport, Runway 6 has pavement markings representing visual approach capabilities, while Runway 24 has markings representing precision approach capabilities.

The taxiway system at McClellan-Palomar Airport is marked with yellow centerline and edge lines. In addition, the parallel taxiway is marked with the word "TAXI" at the approach end of Runway 24. This marking is used to distinguish the taxiway from the runway to aircraft approaching Runway 24, due to glare and visibility extinction caused by the setting sun.

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 may serve as both enroute and terminal navaids.

Enroute Navaids

Enroute navaids are comprised of two basic types of equipment, the Very High Frequency Omnidirectional Range (VOR) and the Very High Frequency Omnidirectional Range Tactical Air Navigation (VORTAC). The VOR provides bearing (direction) information to pilots while a VORTAC produces both bearing and distance information. The VOR is commonly linked with Distance Measuring Equipment (DME) to provide nearly identical information as the VORTAC. The VOR transmits radio signals every degree to provide 360 individual courses from the transmitting facility. Both the DME and TACAN provide slant range distance to the station in nautical miles (NM). The VOR, a Very High Frequency (VHF) facility, and the TACAN, a Ultra High Frequency (UHF) transmitter, are limited to line-of-sight transmissions; their ranges are affected by the altitude of the aircraft.

There are three commonly used enroute navaids in the McClellan-Palomar Airport area: the Oceanside VORTAC, located 10 NM northwest of the airport, the Mission Bay VORTAC, located 21 NM south of the airport, and the Julian VORTAC, located 35 NM east of the airport. **Table 1D, Navigational Aid Data,** summarizes the enroute navaids in the McClellan-Palomar Airport area.

Terminal Area Navaids

Terminal navaids are those located at or near the airport, which assist pilots in flying the appropriate path to the runway end. Currently there are three terminal navaids in the McClellan-Palomar Airport area: an Instrument Landing System (ILS), the Oceanside VORTAC, and the Escondido Nondirectional Beacon (NDB). The instrument approach procedures associated with these three navaids will be described later in this chapter. **Table 1D, Navigational Aid Data,** summaries the terminal area navaids at McClellan-Palomar Airport.

TABLE 1D
Navigational Aid Data
McClellan-Palomar Airport

Name	Identifier	Frequency	TACAN Channel	Location
Oceanside VORTAC	OCN	115.3	100	10 NM to the NW
Mission Bay VORTAC	MZB	117.8	125	21 NM to the S
Julian VORTAC	JLI	114.0	87	35 NM to the E
Escondido NDB	EKG	374	N/A	10 NM to the E
McClellan-Palomar Airport ILS	I-CRQ	108.7	N/A	On-Airport

Notes: N/A - Not Applicable, NM - nautical mile, NW - northwest, S - south, E - east

Source: DOC/NOAA Airport/Facility Directory, dated March 3, 1994

LANDSIDE FACILITIES

In addition to the airside facilities described, landside facilities are essential to the daily operation of McClellan-Palomar 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, hangars, aircraft parking aprons, fuel storage facilities, and automobile parking.

Terminal Building Area

The terminal building area at McClellan-Palomar Airport is located on the south side of the runway near mid-field. The existing terminal building was constructed in 1960 and expanded in 1962. As illustrated in **Exhibit 1E, Terminal Area Facilities**, the existing terminal building is approximately 2,900 square feet in size.

Commercial service passengers are accommodated in two portable trailers west of the terminal building. Each facility is approximately 600 square feet in size and, as illustrated in **Exhibit 1E**, is split into three functional areas (office, lobby, and security areas). Currently, American Eagle operates out of one of the trailer with five daily flights to and from Los Angeles International Airport. American Eagle is currently utilizing the 19 passenger Jetstream 31 aircraft. The other trailer is utilized by United Express, with five daily flights to and from Los Angeles International Airport. United Express utilizes the 19 passenger Beech 1900 aircraft.

Fixed Base Operators (FBOs)

There are three Fixed Base Operators (FBOs), businesses providing a wide variety of pilot/aircraft services, as well as nearly 60 other businesses providing aviation specialty services at McClellan-Palomar Airport. A brief description of the three FBOs is provided in the following paragraphs, each of the facility locations are depicted on **Exhibit 1D, Existing Facilities.**

Cinema Air Jet Center

Cinema Air Jet Center, with 35 employees, provides extensive aircraft service at

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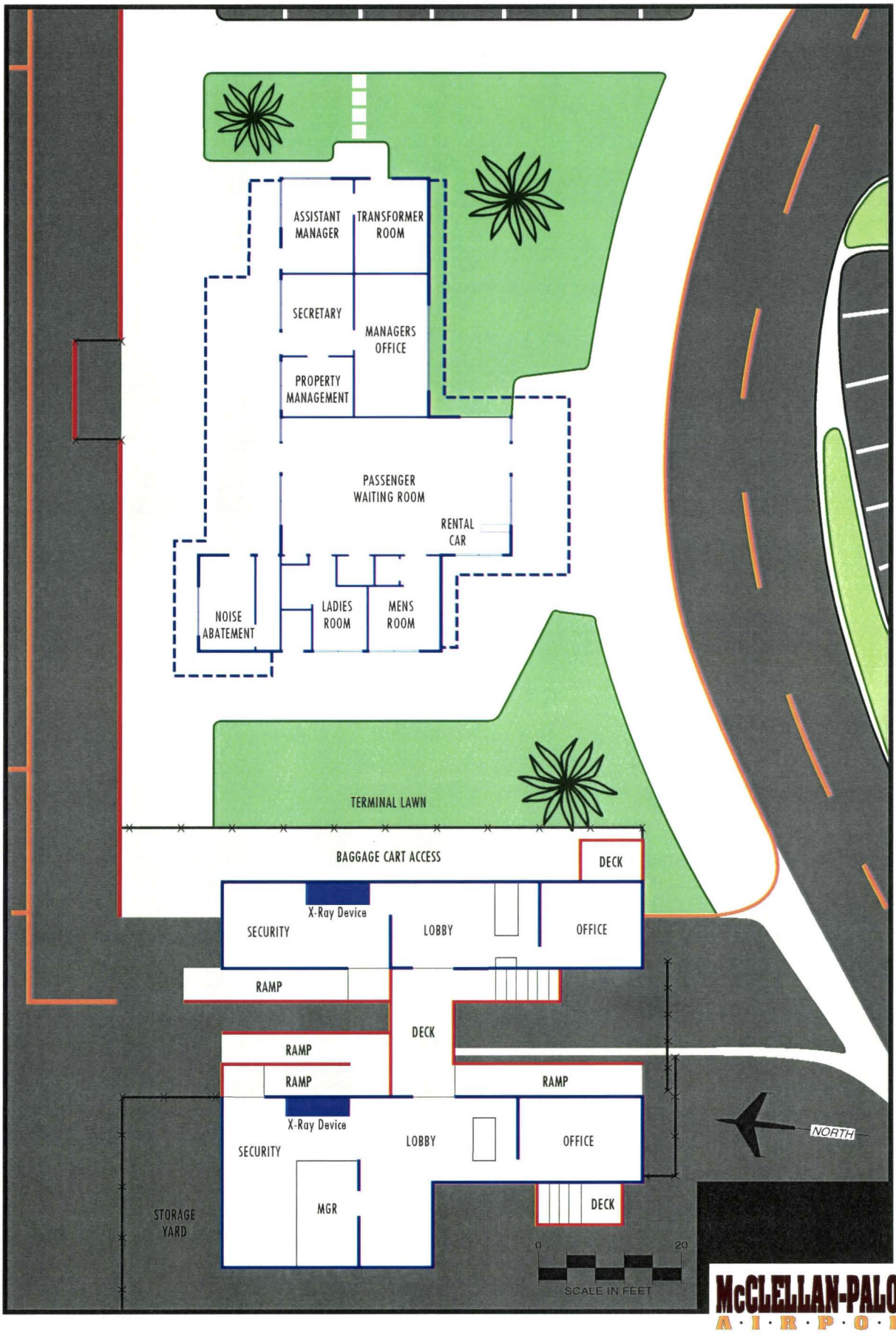

Exhibit 1E
TERMINAL AREA FACILITIES

McClellan-Palomar Airport, selling fuel and oil, conducting aircraft maintenance (including major engine and major avionics repair), and also provides 25 aircraft tiedowns and 45 port-a-port hangar spaces.

Cinema Air Jet Center facilities consists of a 12,000 square foot office building with an attached 44,000 square foot conventional hangar used for storage and maintenance activities. In addition, Cinema Air Jet Center has three other conventional hangars, totaling 56,000 square feet, which are also used for aircraft storage and maintenance.

Gibbs Aviation Services, Inc.

Gibbs Aviation Services, Inc., located in the Mission West Complex in the southwest portion of the airport, sells fuel and oil, and provides for aircraft storage in three executive hangars, 10 multi-engine aircraft hangars, 12 single-engine aircraft hangars, and one 20,000 square foot conventional hangar. Gibbs Aviation Services, Inc. also leases 51 aircraft tiedown positions. In addition, Gibbs Aviation Services, Inc. provides major engine and minor avionics maintenance out of their conventional hangar.

Gibbs Aviation Services, Inc., along with 18 other businesses subleases office space within the Mission West Complex.

Western Flight

Western Flight, located east of the terminal building, sells fuel and oil, conducts major airframe and engine maintenance, and provides aircraft storage on 60 tiedowns and in two conventional hangars (one 16,000 square foot and one 14,000 square foot). With 10 employees, Western Flight is also responsible for emergency aircraft removal and has an agreement with the County to inspect the airport during those times when the airport administration office is closed (i.e., after hours, weekends, and holidays).

Apron and Aircraft Parking Areas

The apron areas are located on the south side of the runway, and are accessed from the parallel taxiway. The apron areas, which includes those facilities identified as FBO facilities, provides a total of 136 aircraft tiedowns. **Exhibit 1D, Existing Facilities**, illustrates the locations of the aircraft parking facilities located at McClellan-Palomar Airport.

Fuel Facilities

Fuel storage at McClellan-Palomar Airport consists of a total storage capacity of 32,500 gallons of AvGas and 60,000 gallons of Jet A fuel. Cinema Air Jet Center owns and operates one 20,000 gallon AvGas storage tank and one 20,000 gallon Jet A storage tank. Western Flight owns and operates one 12,500 gallon AvGas storage tank and two 20,000 gallon Jet A storage tanks. Gibbs Aviation Services, Inc. does not own fuel storage tanks, however, purchases fuel from Western Flight. Each of the three FBOs, however, own and operate fuel trucks to transfer fuel into aircraft.

In addition, two 10,000 gallon AvGas/ kerosene fuel storage tanks are located at the airport, however, these tanks are for private use only. The fuel facilities are identified on **Exhibit 1D, Existing Facilities.**

Automobile Parking

Vehicle parking for the terminal building area serve not only the public, but also the terminal area employees, and the rental car company. The adjacent 53 space parking lot includes 36 short-term spaces, five (5) employee spaces, and 12 rental car spaces. An additional 63 space long-term parking lot is located south of the terminal parking lot. In addition, each FBO and some specialty shops provide automobile parking facilities.

AIRPORT 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. Airport access and available utilities are two support facilities which will be described in the following paragraphs.

Airport Access

Access to McClellan-Palomar Airport is available via Interstate 5, to the Palomar Airport Road Exit, to Yarrow Drive at the airport entrance. Interstate 5, the major highway link between San Diego and Los Angeles, is approximately two miles west of the airport. Palomar Airport Road, a six lane paved road, provides the connection between Interstate 5 and the airport via Yarrow Drive, a two lane paved road. Additional access is provided via El Camino Real, linking Highway 78 with Palomar Airport Road.

Utilities

The availability and capacity of utilities serving the airport are important factors in determining the development potential of the airport property. Of primary concern in the inventory investigation is the availability of water, sanitary sewer, gas, electricity and telephone. Some, if not all, of these utilities will be necessary for any future development at McClellan-Palomar Airport. The airport is served by the following utilities.

- The City of Carlsbad provides water service to McClellan-Palomar Airport utilizing a gravity distribution system. The current pipeline capacity is 260,322 gallons/minute.

- Sanitary sewerage treatment and disposal is also provided by the City of Carlsbad through the use of a 22.5 million gallon sewerage plant facility.

- Natural gas and electric power is provided by San Diego Gas and Electric Company.

- Telephone service is provided by Pacific Bell Telephone.

AIRSPACE AND AIR TRAFFIC CONTROL

An analysis of the airspace structure in the vicinity of McClellan-Palomar Airport is necessary to determine the operational interaction among the various types of airspace and airspace users. Flights in and out of McClellan-Palomar Airport are conducted using Visual Flight Rules (VFR) or Instrument Flight Rules (IFR). VFR conditions exist when flight visibility is three miles or greater and the cloud ceiling is at least 1,000 feet above the ground. IFR conditions exist when visibility or cloud levels are reduced below VFR conditions. Currently, McClellan-Palomar Airport has an

air traffic control tower (ATCT) providing all necessary communications and navigational assistance to pilots operating in and out of the airport. The terminal and enroute ATC services are provided by San Diego Terminal Radar Approach Control (TRACON) and the Los Angeles Air Route Traffic Control Center (ARTCC) facilities.

As depicted in **Exhibit 1F, Airspace**, other airports (both public and private) are located within the region surrounding McClellan-Palomar Airport. The airspace and airports that are associated with the McClellan-Palomar Airport area are discussed in the paragraphs that follow.

AREA AIRPORTS

There are four public airports, three private airports, and two military airports within a 20 nautical mile (NM) range of McClellan-Palomar Airport. The following four airports are public airports: Fallbrook Airport, 14 NM north, with a 2,100 foot paved runway; Ramona Airport, 19.5 NM east, with a 4,000 foot paved runway; Montgomery Field, 20 NM south-southeast, with three paved runways, a 3,402 foot, 3,400 foot, and a 3,399 foot runway; and Oceanside Airport, 6.5 NM northwest, with a 3,000 foot paved runway. The following are the three private airports in the area: Blackinton, 12 NM northeast, with a 2,200 foot unpaved runway; Pauma Valley, 18 NM northeast, with a 2,700 foot paved runway; and Lake Wohlford, 14.5 NM east, with a 1,300 foot unpaved runway. The two military airports are MCAS Camp Pendleton/Munn Field, 11 NM northwest, with a 6,000 foot paved runway, and NAS Miramar, 17 NM southeast, with three paved runways, a 12,000 foot, a 8,000 foot, and a 6,000 foot runway.

AIRSPACE STRUCTURE

Effective on September 16, 1993, the airspace classifications in the United States changed to conform to the International Civil Aviation Organization (ICAO) airspace classifications of A, B, C, D, E, and G (Class F will not be used in the United States). The ICAO airspace classifications are anticipated to become a worldwide standard.

Exhibit 1G, Airspace Classification, illustrates the new classifications and terminology and their relationship to the old system. The following paragraphs describe those new classifications associated with McClellan-Palomar Airport.

San Diego Class B Airspace

The San Diego 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 F.A.R. Part 91. This airspace 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 San Diego Approach Control Facility, and if time permits are provided VFR traffic advisories.

The San Diego 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.

McClellan-Palomar Airport is located approximately 4 NM from the northern most portion of the San Diego Class B Airspace. The San Diego Class B Airspace is depicted on **Exhibit 1F, Airspace.**

McClellan-Palomar Airport Class D Airspace

Class D Airspace is associated with airports with operating control towers. The McClellan-Palomar Airport Class D Airspace includes that airspace within a horizontal radius of five statute miles of the airport, extending from the surface up to 2,500 feet above the airport elevation (2,800 feet MSL). The operating aircraft in this airspace are required to contact the ATC prior to entering. During the times that the ATCT is closed, this airspace reverts to Class G Airspace (uncontrolled airspace). The McClellan-Palomar Airport Class D Airspace is depicted in **Exhibit 1F, Airspace.**

McClellan-Palomar Airport Class E Airspace

Class E Airspace is associated with airports with instrument approach procedures which need additional airspace protection. During the time that the air traffic control tower (ATCT) is operational at McClellan-Palomar Airport, a Class E Airspace sector is active. This airspace provides the ATCT with additional airspace protection during instrument approaches.

RESTRICTED AREAS

Restricted Areas contain airspace identified by an area on the surface of the earth within which the flight of aircraft, while not wholly prohibited, is subject to restrictions. Activities within these areas must be confined because of their nature or limitations imposed upon aircraft operations that are not a part of those activities or both. Restricted Areas generally denote the existence of unusual, often invisible hazards to aircraft such as artillery firing, aerial gunnery, or guided missiles.

If the Restricted Area is active, the ATC facility having jurisdiction over the area will issue clearances to aircraft in order to avoid the restricted airspace unless it is on an approved altitude reservation mission or has obtained prior permission to operate in the airspace. Penetration of Restricted Areas without authorization from the controlling agency may be extremely hazardous to the aircraft and could result in the loss of the pilot's operating certificate. If the Restricted Area is not active and has been released by the controlling agency, the ATC facility will allow aircraft to transition through the airspace without issuing special clearances.

Two Restricted Areas (R-2503 and R-2533) are located approximately 9 NM north of McClellan-Palomar Airport. These areas are primarily used by MCAS Camp Pendleton/ Munn Field for a variety of military training exercises.

AIRWAYS

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

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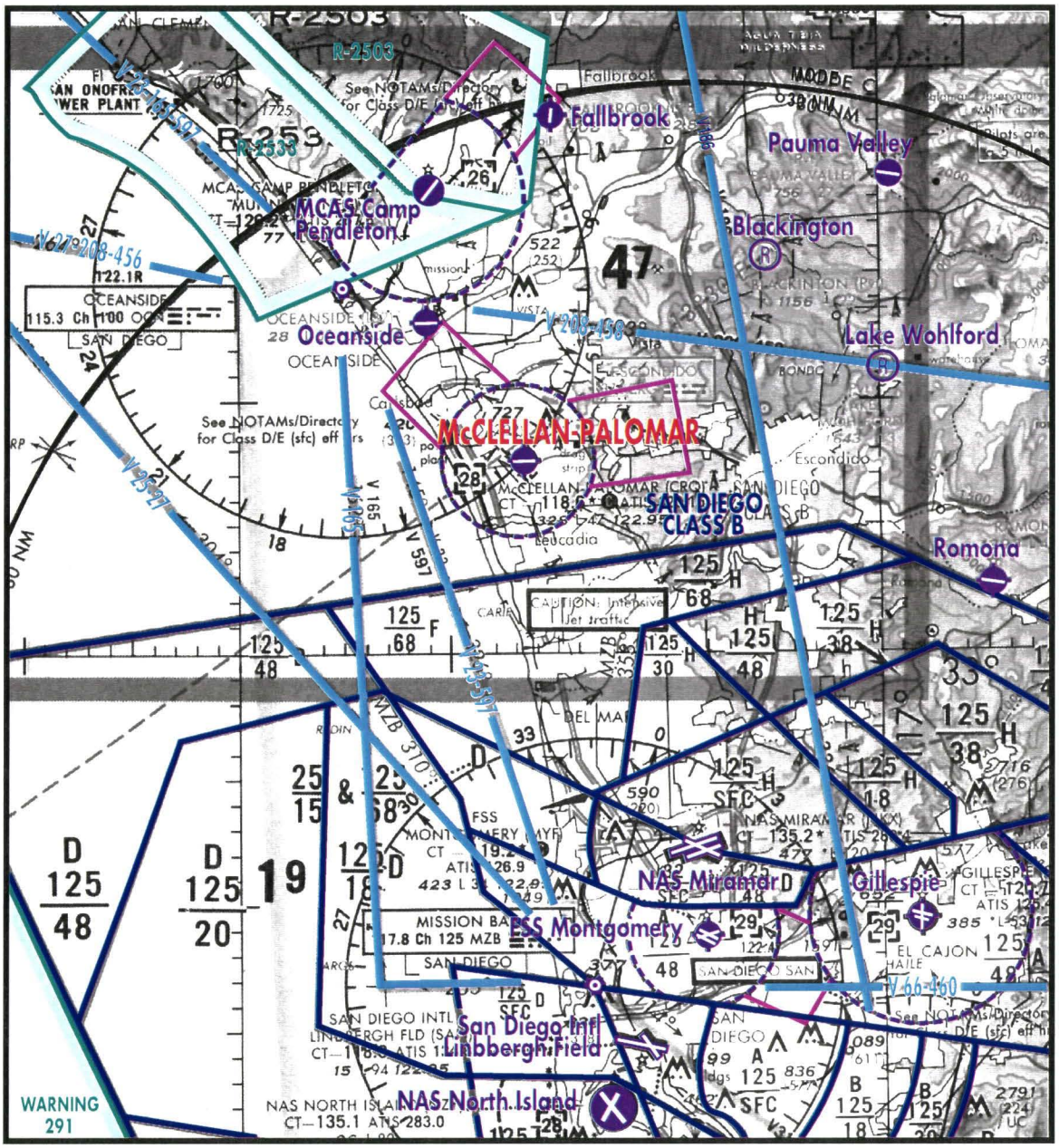


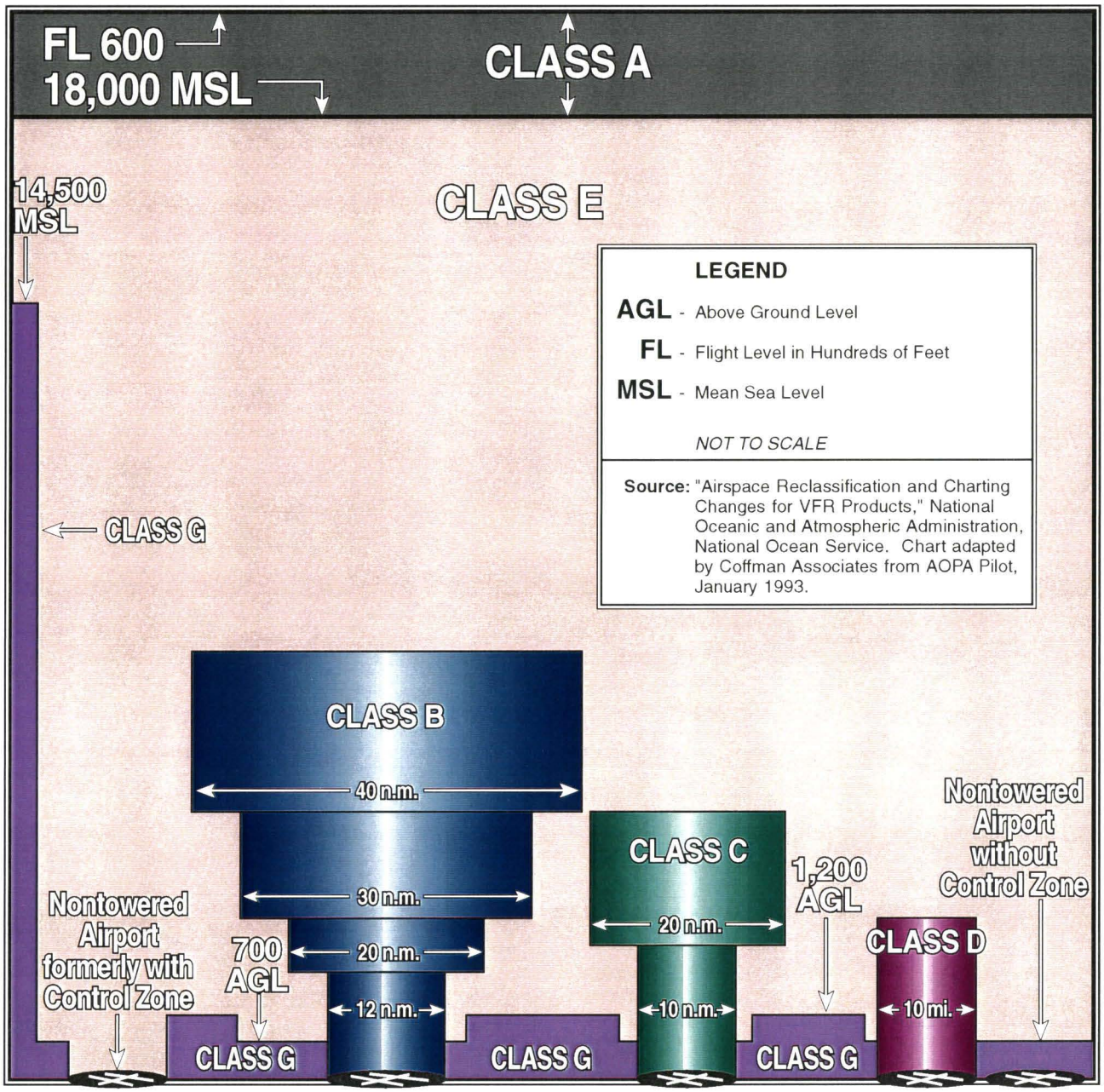
LEGEND :

- Airports with Hard Surfaced Runways
- Hard Surfaced Runways Greater than 8069 ft.
- Airport with Fuel Service
- Private
- VORTAC
- Victor Airways
- Class B Airspace
- Class C, D, or F Control Zone
- Class E Control Zone
- Mode C
- Prohibited, Restricted, and Warning Area

McCLELLAN-PALOMAR AIRPORT

Exhibit 1F
AIRSPACE

93MP12-1G-3/21/93



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

McCLELLAN-PALOMAR AIRPORT

Exhibit 1G
AIRSPACE CLASSIFICATION

Aircraft 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 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.

Three Victor Airways, Victor 165, Victor 23-597, and Victor 208-458, are located in the area of McClellan-Palomar Airport. Victor 165, a north-south airway, is located approximately 6 NM west of the airport. This airway is used to navigate between the Oceanside VOR and the REDIN or SARGS Intersections. Victor 23-597, a north-south airway, is located approximately 4 NM west of McClellan-Palomar Airport. This airway is used to navigate between the Oceanside VOR and the Mission Bay VOR. Victor 208-458, an east-west airway, is located approximately 6 NM north of the airport. This airway is used to navigate between the Oceanside VOR and the Julian VOR.

INSTRUMENT APPROACH PROCEDURES

There are three instrument approach procedures currently available at McClellan-Palomar Airport, the ILS RWY 24, the VOR-A, and the NDB RWY 24. The ILS RWY 24 approach procedure is a precision instrument approach to Runway 24 in weather conditions at or above a 250-foot cloud ceiling and visibility of one mile (CAT I approach). The VOR-A DME approach, provided from the Oceanside VOR, allows for a circling approach in weather conditions at or above a 532 foot cloud ceiling and visibility down to one mile. The NDB RWY 24 approach is provided from the Escondido NDB in weather conditions at or above a 1,437 foot cloud ceiling and visibility down to three-quarter mile.

AIRPORT TRAFFIC CONTROL TOWER

The McClellan-Palomar Airport Traffic Control Tower (ATCT) operates daily from 6:00 am to 9:00 pm, controlling aircraft movement within a five statute mile radius of McClellan-Palomar Airport up to an altitude of 2,500 feet AGL. This facility also coordinates IFR arrivals and departures with the San Diego Approach Control Facility.

In addition, during ATCT operating hours, the ATCT staff acts as a Limited Aviation Weather Reporting Station (LAWRS), providing information on cloud height, weather, obstruction to vision, surface winds, and altimeter setting. During times when the ATCT is closed, some airport information is provided on the Automatic Terminal Information Service (ATIS).

SOCIOECONOMIC DATA

A variety of historical and forecast information related to the McClellan-Palomar Airport area is used in various elements of the Master Plan process. Detailed analysis of this data, as it pertained to the City of Carlsbad and the County area, will be used in subsequent chapters. This information may be used to forecast the airport activity including the number and type of aircraft operations and the number of passenger enplanements at McClellan-Palomar Airport. Socioeconomic factors which have a significant impact on the demand for air transportation will be

analyzed in computing airport operations. Population growth trends and the economic base of the entire community are the most important factors to consider in forecasting airport activity.

POPULATION

An analysis of population growth in the Carlsbad area was obtained from the U.S. Department of Commerce, the San Diego Association of Governments, and the City of Carlsbad. **Table 1E, Historical Population Statistics**, illustrates the population information for the Cities of Carlsbad, Oceanside, San Marcos, Vista, and the County of San Diego. As shown in **Table 1E, Historical Population Statistics**, the City of Carlsbad has an average annual growth rate of nearly 5.8 percent in the 1980's. The City of Oceanside had a slightly lower growth rate of 5.3 percent, while the Cities of San Marcos and Vista had greater growth rates of 8.3 and 7.2 percents respectively. The County has shown a slightly lower growth rate than that of the Cities of Carlsbad and Oceanside during the same period (3.0 percent).

TABLE 1E
Historical Population Statistics

Year	City of Carlsbad	City of Oceanside	City of San Marcos	City of Vista	County of San Diego
1960	9,253	24,971	N/A	N/A	1,033,011
1970	14,944	40,494	3,896	24,688	1,257,954
1980	35,940	76,698	17,479	35,834	1,858,217
1990	63,126	128,398	38,974	71,872	2,498,016
Average Annual Growth Rate (1980-1990)	5.79%	5.29%	8.35%	7.21%	3.00%

Source: California Department of Finance; San Diego Association of Governments

EMPLOYMENT

The City of Carlsbad has exhibited strong economic growth over the years due to continued economic development in the area. This economic development has provided a location for a variety of major employers. **Table 1F, Major Employers**, identifies the major manufacturing and non-manufacturing companies with 90 or more employees within the Carlsbad area.

TABLE 1F
Major Employers
City of Carlsbad

Name of Company	Employees	Product
Manufacturing Companies		
Hughes Aircraft Company	1,500	Electronic Components
Taylor Made Golf	280	Golf Clubs
Eaton-Leonard Corp.	275	Vending Machines
Beckman Instruments	240	Microbics Operation
Dyna Industries, Inc.	195	Medical Products
Watkins Manufacturing Corp.	185	Medical Products
Sierracin-Magnedyne, Inc.	162	Electronic Motors
Sargent Industries	150	Industrial Seals
Non-Manufacturing Companies		
Tri-City Medical Center	1,450	District Hospital
Plaza Camino Real	1,000	Shopping Center
La Costa Hotel and Spa	1,000	Hotel/Health Spa
Car Country Carlsbad	500	Car Dealerships
City of Carlsbad	435	Government
Carlsbad unified School District	425	Eduction
San Diego Gas & Electric	414	Electricity and Gas
Farmer's Insurance Group	320	Insurance
Pea Soup Andersen's	200	Restaurant/Hotel
Daniel's CableVision	90	Cable TV

Source: Carlsbad Chamber of Commerce

The employment sector in the City of Carlsbad is comprised mainly of the Manufacturing (25.0%), Retail Trade (21.6%), and Services (24.0%) sectors. **Table 1G, Employment Sector Percentages,** indicates the employment breakdown by percentages of each of the employment sectors for the City of Carlsbad.

TABLE 1G
Employment Sector Percentages
City of Carlsbad

Employment Sector	Employees	Percentage
Agriculture, Forestry, and Fishing	876	3.7%
Construction	1,309	5.6%
Manufacturing	5,864	25.0%
TCU[1]	1,540	6.6%
Wholesale Trade	575	2.5%
Retail Trade	5,055	21.6%
FIRE[2]	1,410	6.0%
Services	5,632	24.0%
Government and Military	1,183	5.0%
Total	23,444	100%

Notes: [1] Transportation, Communication, and Public Utilities
[2] Finance, Insurance, and Real Estate

Source: San Diego Association of Governments

INCOME

Per capita income for the County of San Diego has grown steadily throughout the last decade. The County's per capita income level, however, remains below that of the State of California but above that of the United States. **Table 1H, Per Capita Income**, compares the per capita income for the three jurisdictions between 1980 and 1990.

TABLE 1H
Per Capita Income

Year	County of San Diego	State of California	United States
1980	$11,605	$11,605	$9,919
1981	$12,701	$12,701	$10,949
1982	$13,202	$13,202	$11,480
1983	$13,913	$13,913	$12,098
1984	$14,053	$15,096	$13,114
1985	$15,095	$16,033	$13,896
1986	$15,847	$16,784	$14,597
1987	$16,658	$17,724	$15,424
1988	$17,654	$18,829	$16,510
1989	$18,651	$19,840	$17,592
1990	N/A	$20,677	$18,696

Source: Regional Economic Information System, Bureau of Economic Analysis

LAND USE AND ZONING

An evaluation of land uses and zoning regulations in the vicinity of McClellan-Palomar 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 community with the airport.

GENERALIZED LAND USE

McClellan-Palomar Airport is located within the corporate boundaries of the City of Carlsbad, California, within the County of San Diego. The airport is located in an area of industrial and mixed uses (i.e., industrial, commercial, and utilities). The closest residential development areas are located approximately one mile south of the airport. Undeveloped parcels south of the airport are currently planned for industrial uses. **Exhibit 1H, Generalized Land Use**, illustrates the land uses and airport influence area as identified in the current City of Carlsbad General Plan.

CITY OF CARLSBAD ZONING ORDINANCE

The site plan, land uses, and conditions of approval for the McClellan-Palomar Airport are set forth in the conditional use permit (CUP 172) approved by the Carlsbad Planning Commission. Certain structures and facilities require approval by the Carlsbad Planning Commission prior to construction. These facilities include airport administration buildings, airport passenger facilities, and eating and drinking establishments.

In addition, the City of Carlsbad Municipal Code regulates expansion of the airport by way of Ordinance 21.53.015; as follows;

> "21.53.015 Voter authorization required for airport expansion.
>
> a) The city council shall not approve any zone change, general plan amendment or any other legislative enactment necessary to authorize expansion of any airport in the city nor shall the city commence any action or spend any funds preparatory to or in anticipation of such approvals without having been first authorized to do so by a majority vote of the qualified electors of the city voting at an election for such proposes.
>
> b) This section was proposed by initiative petition and adopted by the vote of the city council without submission to the voters and it shall not be repealed or amended except by a vote of the people."

ON-AIRPORT LANDFILLS

Located within the airport property boundaries are three closed landfill sites referred to as Landfill Units 1-3. Since the closure of these sites in the mid-1980's, an airport access road, apron area, and aviation related buildings have been constructed on portions of the landfill areas. Any land use changes on the airport property, and within 1,000 feet of any of these landfill units, is subject to review and comment by the County of San Diego Local Enforcement Agency (LEA) and the california Integrated Waste management Board (CcR Title 14 §17796(b)).

CLIMATE

Weather conditions play an important role in the planning and development of an airport. Temperature is an important factor in determining runway length, while wind speed and direction are used to determine the optimal runway orientation. The percentage of time that visibility is impaired due to cloud coverage of other conditions is a major factor in determining the need for navigational aids and lighting.

The Carlsbad area provides a mild year-around temperature with low humidity and light rainfall. The temperature ranges from an averages of 48 degrees in January to 78 degrees in August. Annual rainfall averages approximately nine inches, most of which falls between November and March. **Table 1I, Weather Summary**, depicts the weather summary for the San Diego area.

TABLE 1I
Weather Summary
San Diego, California

Month	Average Temperature (°F)		Average Total Precipitation (Inches)
	Daily Maximum	Daily Minimum	
January	65.2	48.4	2.11
February	66.4	50.3	1.43
March	65.9	52.1	1.60
April	67.8	54.5	0.78
May	68.6	58.2	0.24
June	71.3	61.2	0.06
July	75.6	64.9	0.01
August	77.7	66.8	0.11
September	76.8	65.1	0.19
October	74.6	60.3	0.33
November	69.9	53.6	1.10
December	66.1	48.7	1.36
Year	70.5	57.0	9.32

Source: National Oceanic and Atmospheric Administration (NOAA)

According to the ATCT staff, prevailing winds are primarily out of the west, favoring the use of Runway 24. The windrose illustrated in **Exhibit 1J, Windrose,** was constructed from historical wind data recorded at McClellan-Palomar Airport. An analysis of the hourly weather observations during the period, 1968-1977, reveals that Runway 6-24 provides 97.95 percent coverage of the 12 mile per hour (mph) crosswind component, a 98.65 percent coverage of the 15 mph crosswind

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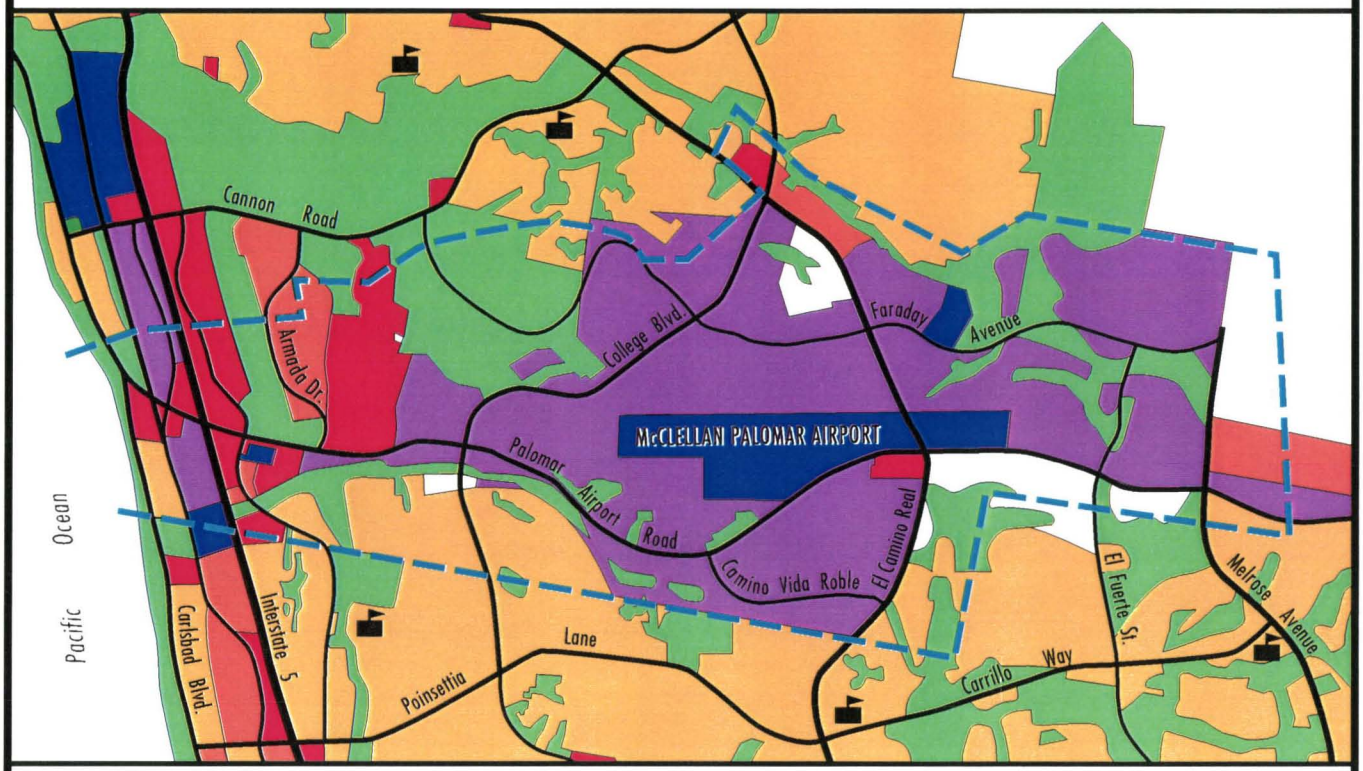


LEGEND :

- RESIDENTIAL
- COMMERCIAL/PROFESSIONAL
- MIXED USES
- OPEN SPACE/PARKS
- INDUSTRIAL
- GOVERNMENTAL FACILITIES/PUBLIC UTILITES
- UNPLANNED AREAS
- SCHOOL
- AIRPORT INFLUENCE AREA

NORTH

0 5000

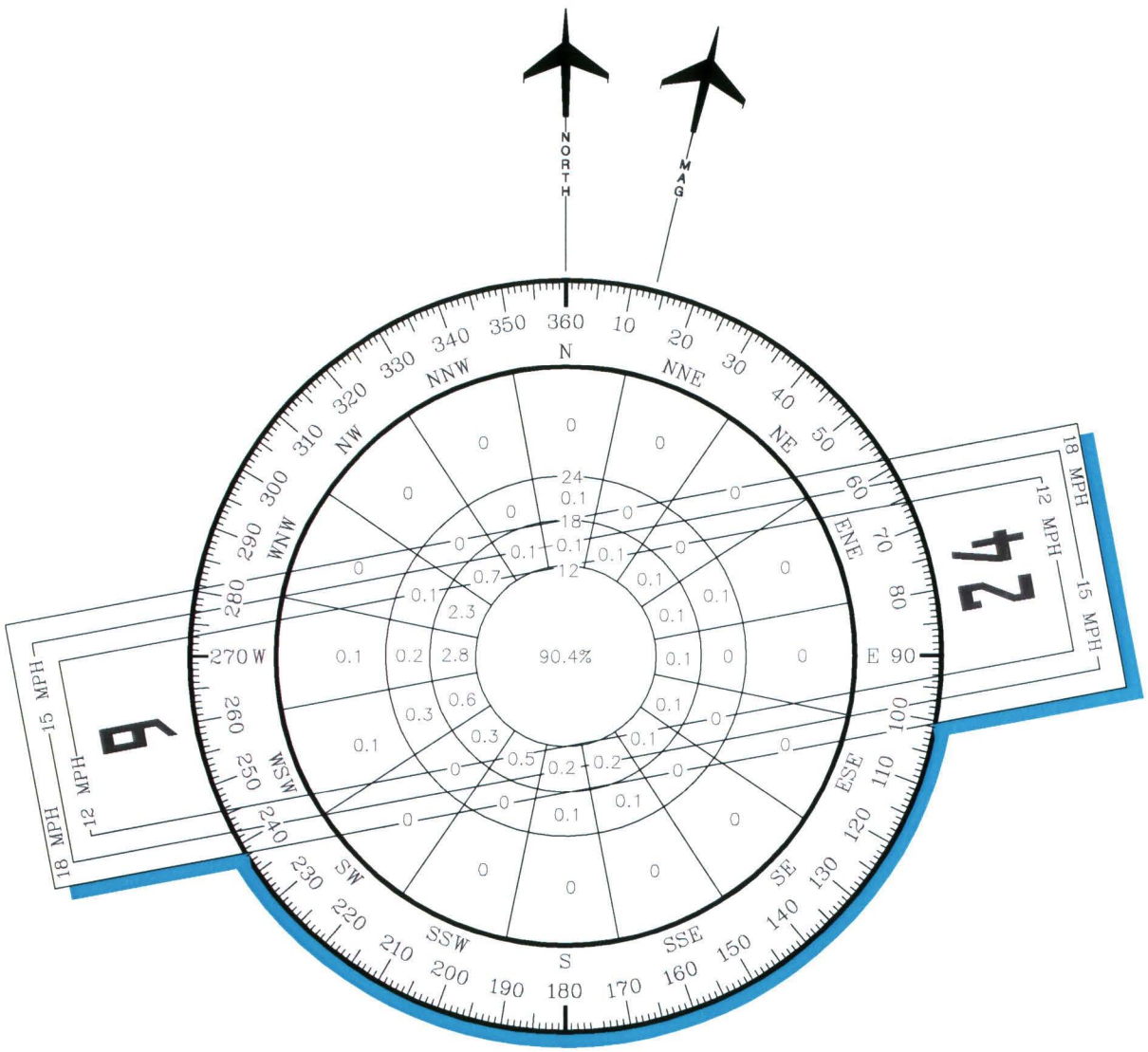
SCALE IN FEET

SOURCE : General Plan Land Use Map, City of Carlsbad - Apr., 1996

McCLELLAN-PALOMAR AIRPORT

Exhibit 1H
GENERALIZED LAND USE

93MP12-1J-3/22/93



SOURCE:

McCLELLAN–PALOMAR AIRPORT
CARLSBAD, CALIFORNIA

OBSERVATIONS:

Hourly Observations
1968–1977

ALL WEATHER WIND COVERAGE			
	12 M.P.H.	15 M.P.H.	18 M.P.H.
Runway 6–24	*97.95%*	*98.65%*	*99.75%*

McCLELLAN-PALOMAR AIRPORT

Exhibit 1J
WINDROSE

component, and a 99.75 percent coverage of the 18 mph crosswind component.

SUMMARY

This chapter has provided an inventory of those facilities that would effect the future development of the McClellan-Palomar Airport. The data collected for this chapter provides the information necessary to perform subsequent analysis. It also provides the proper perspective from which to develop a realistic Master Plan that will meet the needs of both the County of San Diego and the City of Carlsbad. The next chapter will examine the current demand for aviation facilities and how these demands can be expected to change in the future. Projections of aviation activity through the year 2015 will be prepared in order to identify the necessary facilities required to meet this demand.

Chapter Two

AVIATION DEMAND FORECASTS

McCLELLAN-PALOMAR AIRPORT

Chapter Two

McCLELLAN-PALOMAR AIRPORT

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 McClellan-Palomar Airport, this involves the development of a set of forecasts that may 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 can be established, however, 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.

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 advancements, 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

estimate" or selected forecasts for the facility.

In addition, it must be realized that the forecasts presented in this chapter are "unconstrained" in nature. The existing physical or policy constraints at McClellan-Palomar Airport will not be taken into consideration during the development of these forecast numbers. Chapter Five, Development Alternatives, will begin to address the physical and policy constrains and will identify the "constrained" aviation forecast.

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 considered 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, based and registered aircraft, passenger enplanements and fuel sales 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 recognizing that correlation and, therefore, reliability is not as strong.

In *regression 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, with projected values of the independent variable(s), 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 this 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 general 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
- Military Activity
- Passenger Enplanements
- Commercial Service Operations
- Air Taxi 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 (e.g. Facility Requirements) must incorporate a degree of flexibility that will be responsive to deviations from the selected forecasts (e.g. 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, general aviation, and military 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 1994-2005*, was used as a basis for the development of a series of forecasts for McClellan-Palomar Airport. A synopsis of the FAA report of both existing and anticipated future conditions in the aviation sector is presented in the paragraphs that follow.

GENERAL AVIATION

As World War I ended in late 1918, thousands of military aircraft were sold as surplus. These aircraft were purchased by former World War I pilots who became known as "barnstormers", putting on airshows and providing rides for the local community. The passage of the Air Commerce Act in 1926 required the licensing of pilots as well as aircraft maintenance regulations, thus ending the era of the barnstormer. A number of these former barnstormers established businesses known as fixed based operators (FBOs), providing flight instruction, aircraft sales, fueling, and maintenance.

In the 1920's, Wichita, Kansas became known as the "largest natural airport" because of the vast area of flat terrain. The start of private aircraft manufacturing began here with the Weaver Aircraft Company (WACO), soon to be followed by the Travel Air Manufacturing Company. In the 1930's, Wichita became the home to the Beech Aircraft Corporation and Cessna Corporation.

After World War II, the term "general aviation" was coined to remove the imagined onus of the term "private flying" from the industry. General aviation denoted aviation used for vital, useful, general purposes, much like the private automobile. In the late 1940's, the general aviation manufacturers began to look at the development of aircraft to be used as reliable business transportation. This idea did not catch on until 1953, when the light twin engine aircraft started to become popular.

By the end of the 1950's, the light plane industry was starting to reach maturity. This continued through the 1960's with the development of a wide-range of light single and twin engine aircraft. By this time general aviation became a major part of the country's transportation system, with an inventory of light aircraft that were fully capable of flying 1,500 miles comfortably.

General aviation continues to dominate the aviation industry. In 1992, there were a

total of 17,846 airports/heliports available for general aviation aircraft, of these only 664 airports were served by scheduled airlines. In terms of active aircraft, there were a total of 184,433 active general aviation aircraft in 1993, compared to 4,200 commercial jet aircraft and 6,200 military aircraft. Of the 682,959 certificated pilots in 1993, general aviation accounted for nearly 84 percent of the total. In 1992, general aviation operations accounted for approximately 100.8 million, nearly 75 percent of the total 134.7 million operations.

A number of changes have occurred in the general aviation industry since the 1960's that have affected and continue to affect the future growth rate of general aviation. Historically, the economic cycle of the general aviation industry closely paralleled that of the nations economy. Theories abound as to why the decline in aircraft sales and pilots has not responded to the recent economic growth in the early 1990's. Some cite the high aircraft costs, which have continued to increase even during periods of relatively modest inflation. Others cite high operating and increased liability costs. In addition, the Veteran's Bill (G.I. Bill), which provided financial assistance for flight training, also expired resulting in the number of pilots to no longer be artificially supplemented by the armed services.

On a positive side however, recent legislation on manufacturers liability has stimulated the interest in the resurrection of general aviation aircraft manufacturing. The last decade has seen a dramatic growth in the development of "kit" or "home-built" aircraft. In addition, use of general aviation aircraft by business is on an increase. As a result, the character of the general aviation fleet continues to change. The more expensive and sophisticated turbine-powered components of the general aviation fleet is expected to grow much faster than piston aircraft.

According to the FAA Forecasts, Fiscal Years 1994-2005, single engine piston aircraft are projected to decrease in the short-term from 143,580 in 1993 to 131,100 in 1998 and remain relatively stable during the remaining forecast period. The short-term decline is anticipated to be due to the large numbers of retirements and/or shifts to nonactive status of many of the older aircraft in the general aviation fleet. Multi-engine aircraft are also expected to decline in the short-term from 18,536 in 1993 to 17,300 in 1998. The multi-engine fleet is, however, expected to increase slightly during the remainder of the forecast period to 17,600 in 2005. Reflecting the increased convenience of general aviation flying to businesses and their push for technology, turbine-powered aircraft are projected to increase by an average annual growth rate of 2.4 percent from 3,541 aircraft in 1993 to 5,800 aircraft in 2005.

AIR CARRIER AND REGIONAL/ COMMUTER AIRLINE TRENDS AND FORECAST

October 1993 marked the fifteenth anniversary of the Airline Deregulation Act, perhaps one of the most important events in aviation history. Since enactment of this legislation, we have witnessed a number of significant structural and operational changes in the commercial aviation industry. During this period, the air carrier industry has gone through three distinct phases (expansion, consolidation and concentration) and begun the fourth (globalization).

The initial phase of deregulation was characterized by the expansion of the

airline industry. After the Airline Deregulation Act of 1978, a record number of new airlines entered the marketplace. The number of large air carriers grew from 30 to 105, including America West, Southwest and USAir.

With competition among airline companies being fierce, there was a proliferation of low air fares to stimulate demand and to compete with the low fares offered by airlines such as Southwest and Morris. These low fares were partially responsible for the dramatic increase in passenger traffic in the 1980's. During this period, many smaller markets experienced improved air service with increased frequencies through connecting hub airports to multiple destinations. The onset of airline hubbing at an airport translated into substantial investment into communities across the nation. Although initially rejected by the flying public as inconvenient, the "hub and spoke" system of airline travel has since become the norm.

Growth in the late 1970's through mid 1980's led the airline industry to continue to invest in new aircraft, technology and the hub-and-spoke concept. These strategies were premised on continued robust airline passenger traffic demand; however, this demand began to diminish and the nation became involved in an economic recession. As a result, between the late 1980's and early 1990's 115 airline companies either ceased to exist, merged with other airlines, downsized their service to a regional/ commuter status, or filed for protection under the Chapter 11 bankruptcy laws. In an effort to remain afloat in the 1980's and early 1990's several airline companies merged. This trend of consolidation among the larger airline companies in continuing.

The regional/commuter airlines have experienced similar changes as a result of industry expansion, with the number of carriers increasing from 210 in 1978 to 250 in 1981, then declining through 1993 to 136. In an effort to consolidate operational costs, the regional/commuter airlines have become increasingly integrated with the large, scheduled air carriers through code-sharing agreements. As some of the remaining regional airlines have developed profitable route structures, another emerging trend is the actual acquisition of some of these airlines by their larger partners.

The latest strategy emerging from the airlines is that of "concentration." In effect, the airlines are becoming increasingly sensitive to regional, national and global passenger traffic trends, and are seeking to maximize the profitability of individual routes. With consolidation, a greater concentration of airline market share has occurred. The four largest U.S. carriers accounted for 60 percent of the domestic revenue passenger miles in 1990, compared to 52.5 percent in 1978. The three largest U.S. carriers (American, United and Delta) now carry over half of the domestic traffic.

The industry trend of concentrating on successful markets has also impacted the airlines aircraft orders, including sales and leasing. Only a few years ago, the airlines continued ordering new and larger aircraft. In part, these orders were necessary to replace the Stage 2 aircraft fleet with quieter Stage 3 aircraft by the legislated date of December 31, 2003. Many aircraft orders, however, were placed when short-term national and worldwide growth in passenger traffic was still expected to be strong.

Recently though, new orders for aircraft have focused on reducing excess seating capacity by utilizing more narrow-bodied aircraft. This trend is reflective of industry

concerns over future passenger traffic demand and market concentration. As an example, the Boeing company has recently slowed production of its 777 aircraft, and the McDonnell Douglas manufacture of its MD-11 has also been recently reduced.

Commuter airlines have stepped up to place new orders in the regional jet market with passenger seating capacities in the 40+ seat range. This represents a significant upscaling of the regional/ commuter fleet from the standard 19 to 40 seat range of the recent past. The Canadair Regional Jet, the Fokker 70, and the EMB-145 regional jet are examples of new aircraft expected to fill a niche in regional air travel route structures.

The U.S. commercial aviation industry recently entered into a fourth phase of the deregulation process -- Globalization. This, combined with other "free market" movements around the world, such as the deregulation of the European Common Market in December 1992 and the political shift in the former Soviet Bloc Nations, opens up the possibility of the creation of multi-national "mega-carriers" throughout the world. With the dramatic increase of international mergers and alliances since 1989, some have predicted that there will only be a dozen world airlines by the twenty-first century. The race among the world's air carriers is now on to see who can put together the most effective global system.

Global airline strategies include marketing agreements, "code-sharing", and/or equity stakes in other carriers. What this means for the commercial aviation industry is currently open to speculation. One thing is certain, however, the airline industry worldwide will continue to exhibit strong growth rates well into the twenty-first century. Also, the U.S. experience with code-sharing agreements between the large air carriers and regional/commuters suggests that the smaller carriers benefit from working relationships with the larger airlines. In future years, the same could be true for competition in international markets.

The FAA projections for passenger enplanements on both the major and regional/commuter airlines remains strong through the year 2005. **Exhibit 2A, Major and Regional Airlines Forecast Passenger Enplanements**, illustrates the anticipated growth in these two areas.

OTHER AVIATION STUDIES

In order to develop aviation forecasts for McClellan-Palomar 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 these studies are briefly summarized in the following sections.

1975 PALOMAR AIRPORT MASTER PLAN

The last airport master plan completed for McClellan-Palomar Airport was conducted in 1975. As was stated earlier, the aviation industry has evolved through many changes since this document was completed, however, the projected aviation activities are described in the following paragraphs.

The 1975 Airport Master Plan anticipated "unrestricted" demand to be approximately 500,000 annual operations by the year 1990. The Master Plan identified a number of improvements that would be needed to meet this anticipated growth. These improvements were examined in seven

alternatives, of which the recommended alternative included the construction of a parallel runway, the extension of the existing runway, construction of additional taxiways, and improvements to the lighting and navigational approach aids.

Out of those improvements recommended in the 1975 Master Plan, the most significant were the construction of the parallel runway and the extension of the existing runway. Since the completion of that Master Plan, certain management and local policies have been established that place controlling measures on the types of development and operational levels that can occur at McClellan-Palomar Airport. These management and local policies will be reviewed later in this chapter. With the exception of the construction of the parallel runway and the extension of the existing runway, most of the recommended development items identified in the previous Master Plan have been completed to date.

FAR PART 150 STUDY

In 1990, an Federal Aviation Regulation (FAR) Part 150 Noise Compatibility Study was completed for McClellan-Palomar Airport. The purpose of this document was to determine the noise impacts on surrounding land uses and, if necessary, recommend changes to the flight patterns or operational restrictions to potentially reduces these impacts. The recommendations from this Study included operational changes and encouraged changes to existing zoning ordinances and General Plans.

During the development of the FAR Part 150 Study, forecast of aviation activity at McClellan-Palomar Airport were prepared. Using 1989 as a base year, aircraft operations were projected for 1995. The operations at McClellan-Palomar Airport were anticipated to level-off at 290,000 annual operations by 1995, although the "unconstrained" demand would be approximately 326,000. The difference in operations are due to the limited airport property and anticipated air traffic congestion in the area. The "unrestricted" forecast for the number of based aircraft was determined to be 786 by 1995. Once again, due to the limited amount of airport property, only 600 based aircraft could be accommodated. This study indicates an average annual growth rate of 3.5 percent in operations until the year 1995, at which point it is expected that the operational level would be maximized at 290,000 annual operations. The based aircraft "constrained" forecast indicates an average annual growth rate of 5.0 percent to 1995.

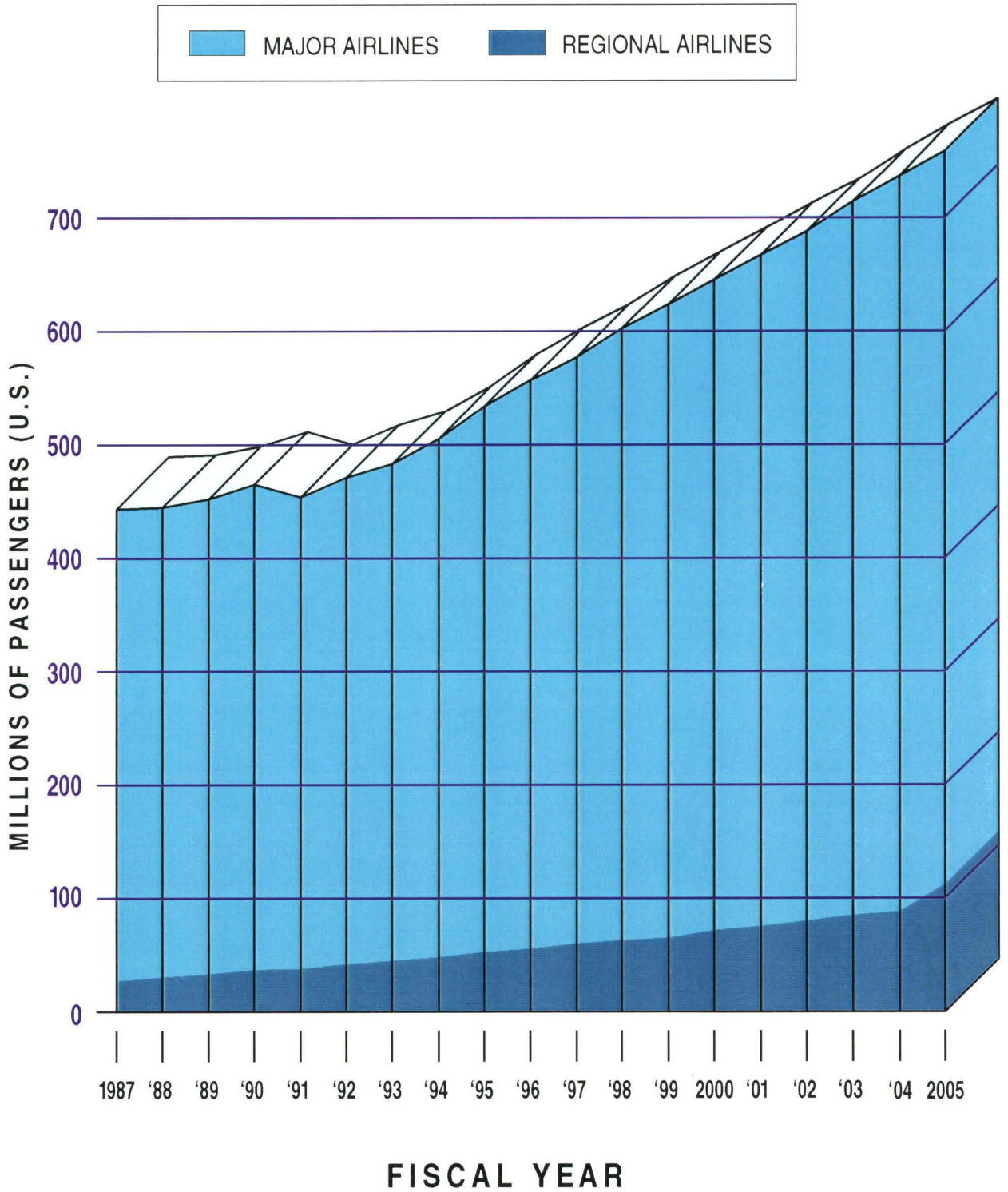
COMPREHENSIVE LAND USE PLAN

In April 1994, the San Diego Association of Governments (SANDAG) updated the 1986 Comprehensive Land Use Plan (CLUP) for McClellan-Palomar Airport. This report was prepared to assist in ensuring the compatible land use development in the area surrounding the McClellan-Palomar Airport.

According to the 1994 CLUP, aircraft operations are projected to increase from 225,000 in 1992 to 290,000 annually by 1995. This increase in operations results in an average annual growth rate of approximately 8.8 percent.

Within the 1994 CLUP, a Noise Impact Notification Area (NINA) was identified. This area represents nearly 90 percent of all noise and overflight related residential areas impacted by aircraft operations to and from McClellan-Palomar Airport. The NINA is

93MP12-2A-6/10/94



*Source: FAA Aviation Forecasts (Fiscal Years 1994-2005), March 1994

McCLELLAN-PALOMAR AIRPORT

Exhibit 2A
MAJOR AND REGIONAL AIRLINES
FORECAST PASSENGER ENPLANEMENTS

composed of a three mile radius around the airport, as well as the instrument corridors associated with the VOR and ILS approaches. All new residential developments located within the NINA shall require a notice concerning the potential aircraft environmental impacts, clarifying that the property is subject to aircraft overflights, sight and sound of aircraft operating from McClellan-Palomar Airport.

SAN DIEGO AIR CARRIER AIRPORT SITE SELECTION STUDY

The purpose of this 1990 study was to identify a preferred site for the development of an air carrier airport to replace Lindbergh Field (San Diego International Airport). The study, prepared by SANDAG, included annual enplanement and operation forecasts for Lindbergh Field. With 10.1 million annual passengers (MAP) in the based year of 1987, the study predicted an increase to 19.8 MAP by the year 2010. This would indicate an average annual growth rate of approximately 3.0 percent.

THE CALIFORNIA AVIATION SYSTEM PLAN

Statewide aviation planning for the State of California is accomplished by the California Department of Transportation, Division of Aeronautics (CalTrans). In 1987, CalTrans began updating the 1981 California Aviation System Plan (CASP), with a projected completion date in 1989.

Element II: Forecasts, Volume 1, dated July 1989, of the CASP identified the forecast based aircraft and operational levels anticipated at McClellan-Palomar Airport by the year 2005. By the year 2005, the projected number of based aircraft and operations were 563 and 309,652 respectively. This would indicate an average annual growth rate of 1.9 percent in based aircraft and 2.6 percent in operations. No commercial service operations or enplanements at McClellan-Palomar Airport were forecast in this study.

REGIONAL TRANSPORTATION PLAN

SANDAG is mandated to periodically update the Regional Transportation Plan (RTP) by State Government Code. This Plan is a set of policies, plans, and programs to guide the effective coordination and orderly programming of transportation improvements among local, regional, state, and federal agencies.

Within the 1993 "Draft" RTP, Chapter 5 identified the aviation portion of the Plan. Using 1991 as a base year, the forecast based aircraft and operational level for McClellan-Palomar Airport were prepared. The based aircraft and operations anticipated at McClellan-Palomar Airport were identified as 584 and 316,349, respectively, by the year 2005. This would indicated an average annual growth rate of approximately 4.8 percent in based aircraft and 1.9 percent in operations.

POLICIES AND ISSUES

McClellan-Palomar Airport is in the unusual position of not having traditional, readily identifiable, solutions to resolving "unconstrained growth" problems. Landlocked on top of a mesa, its physical features, including the runway and taxiway surfaces, are dictated by terrain, and most of the surrounding land mass is developed, supporting a large, light industrial complex.

In addition to physical constraints, capacity and demand are also tempered by environmental constraints which, translated into political action, (i.e., local control due to noise and safety concerns), have created an environment in which expansion of the airport requires constituent input. Therefore, the discussion of a second runway for example, must be viewed by another kind of "demand" perspective. While there may be demand for additional capacity, there must be a corresponding demand from the community to want and accept the necessary changes which result as a matter of course in creating such capacity.

There is also a practical side to the equation, having to do with economies of scale, diminishing returns and return on investment. It will be necessary to equate any significant changes to a cost-benefit analysis. Annual forecasts for based aircraft, forecast operations and passenger enplanements, may not necessarily justify the cost of implementing changes to meet demand. In fact, it appears that future FAA funding may soon require such cost-benefit analysis.

Should, as discussed above, the need arise for increased capacity, including a second runway or runway extension, both constituent approval and environmental documentation will be required prior to implementation. While it is not within the scope of this document to discuss alternatives to demand in great detail, a short synopsis of each policy follows:

SAN DIEGO COUNTY BOARD OF SUPERVISORS POLICY F-44

In 1987, the San Diego County Board of Supervisors established Policy F-44 to provide guidelines for the operation and development of McClellan-Palomar Airport. This policy was modified by the Board in 1991, and most recently in July 1996. The following eight items are identified in Policy F-44. This Policy is scheduled to "sunset" on December 31, 2002; however, the Policy can be reviewed for continuance by the board of Supervisors prior to this date.

- The role of McClellan-Palomar Airport shall be to provide air transportation for the residents of North San Diego County and to facilitate General Aviation activities while minimizing noise impacts on surrounding areas and communities.

- Scheduled commuter airline operations are limited to aircraft having 10 to 60 seats and meeting the approach speed and wing span categories for McClellan-Palomar Airport in accordance with FAA regulations. Commuter airline aircraft shall meet the FAA Stage III noise criteria.

- The Airport will operate with one runway that simultaneously accommodates a 4,700-foot landing distance and a 5,000-foot takeoff distance; the 300-foot difference, a displaced threshold on the runway's east end, will increase safety of the airport while reducing noise levels.

- The County will take a pro-active role working with local agencies and the FAA to protect the airspace around the airport from encroachment and to promote compatible off-airport land development, and to insure the future safety and compatibility of the existing runway length.

- The County will operate the airport in accordance with any adopted FAA Part 150 Noise Compatibility Program and in full compliance with any State or Federal mandated noise standards relating to the operation of a public airport. The program will recognize the Noise Element of the City of Carlsbad's General Plan and implement mitigation measures to minimize noise impacts.

- The County will monitor aircraft noise and verify the Community Noise Equivalent Level (CNEL) noise contours within the airport influence area as described in the Palomar Airport Comprehensive Land Use Plan as well as monitor pilot compliance with any adopted FAA Part 150 Noise Abatement Program. The County will continue to monitor air traffic around the airport with a noise monitoring and flight tracking system and implement procedures to mitigate single event noise complaints.

- The Airport Manager will produce, distribute and promote a detailed noise abatement program for the airport. The program will contain specific flight information and a chart identifying noise sensitive areas. The noise abatement program will be updated annually and distributed to pilots. The Airport Manager will request pilot compliance with the program.

- The policy recognizes SANDAG's Airport Land Use Plan.

CITY OF CARLSBAD ORDINANCE 21.53.015

The site plan, land uses, and conditions of approval for the McClellan-Palomar Airport are set forth in the conditional use permit (CUP 172) approved by the Carlsbad Planning Commission. Certain structures and facilities require approval by the Carlsbad Planning Commission prior to construction. These facilities include airport administration buildings, airport passenger facilities, and eating and drinking establishments. In addition, Carlsbad Municipal Code regulates the expansion of McClellan-Palomar Airport by way of the following ordinance:

> "21.53.015 Voter authorization required for airport expansion.
>
> a) The city council shall not approve any zone change, general plan amendment or any other legislative enactment necessary to authorize expansion of any airport in the city nor shall the city commence any action or spend any funds preparatory to or in anticipation of such approvals without having been first authorized to do so by a majority vote of the qualified electors of the city voting at an election for such proposes.
>
> b) This section was proposed by initiative petition and adopted by the vote of the city council without submission to the voters and it shall not be repealed or amended except by a vote of the people."

POLICIES AND ISSUES SUMMARY

As stated in the previous policies, certain limitation are currently in place for

development at McClellan-Palomar Airport. While each of these policies will need to be examined based on both demand and capacity at McClellan-Palomar Airport, this chapter will provide unconstrained aviation forecasts. The following chapter will examine the facilities necessary to fulfill the unconstrained demand, while the subsequent chapter will examine alternative means to accommodate these unconstrained demands. If the unconstrained demands can not be accommodated due to physical constraints or policy decisions, the "constrained" aviation forecast levels will then be determined.

POPULATION TRENDS AND FORECASTS

Historical as well as forecast population data normally provide a good indication of future aviation demand at an airport. Since previous population growth of a community or service area can be tracked, past growth trends can then be correlated to airport activity. A service area growth rate in population will normally produce a demand for airport services. Conversely, a service area with little growth or a net population decrease will generally not produce an increased demand for airport services.

To determine the aviation demand for McClellan-Palomar Airport, the role of the 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 McClellan-Palomar Airport is located in the northwest portion of San Diego County and in southern California, therefore, for the purposes of this study the airport service area was generally defined as the population centers of the communities of Carlsbad, Oceanside, San Marcos, Vista, Encinitas, Escondido, and Fallbrook. It is anticipated that the airport will continue to serve the needs of the residents in these areas. Since the City of Oceanside has a general aviation airport, it is anticipated that, for the most part, those residents in Oceanside and Fallbrook area would utilize the Oceanside Municipal Airport for general aviation purposes, however, could use McClellan-Palomar Airport for commercial service (commuter) purposes.

Table 2A, Forecast Population Growth, indicates the population forecast for those areas determined to be located in the McClellan-Palomar Airport Service Area based on the San Diego Association of Governments (SANDAG) Series 8 forecasts. The SANDAG Series 8 forecasts, however, are not expected to be officially adopted until the end of 1994. The population of the General Aviation (G.A.) Service Area and the Commercial Service (C.S.) Service Area are also presented in **Table 2A.**

The average annual growth rates of these population forecasts, indicate that San Marcos has the highest at 2.98 percent, followed by Carlsbad with 2.45 percent. Encinitas had the lowest growth rate of 0.41 percent. The G.A. Service Area and the C.S. Service Area had average annual growth rates of 1.34 percent and 1.40 percent, respectively.

TABLE 2A
Forecast Population Growth

Region	January 1994	1995	2000	2005	2010	2015
City of Carlsbad[1]	67,923	70,879	87,706	95,398	103,765	112,865
City of Oceanside[1]	145,404	148,123	162,498	171,358	180,701	190,553
City of San Marcos[1]	45,991	48,735	65,113	71,211	77,880	85,174
City of Vista[1]	79,511	80,089	83,045	85,026	87,054	89,130
City of Encinitas	58,011	58,318	59,946	61,027	62,127	63,247
City of Escondido	116,938	118,181	127,308	130,513	133,799	137,167
City of Fallbrook[2]	34,755	35,600	40,000	44,944	50,499	56,740
G.A. Service Area[3]	368,374	376,202	423,118	443,175	464,625	487,583
C.S. Service Area[4]	548,533	559,925	625,616	659,477	695,825	734,876

Notes: [1] 1995, 2005, and 2010 interpolated by Coffman Associates
[2] 1994, 1995, 2005, 2010, and 2015 interpolated by Coffman Associates
[3] General Aviation Service Area includes Carlsbad, San Marcos, Vista, Encinitas, Escondido, and Fallbrook
[4] Commercial Service Area includes G.A. Service Area and Oceanside

Sources: San Diego Association of Governments, "Draft" Regional Transportation Plan; County of San Diego

GENERAL AVIATION ACTIVITY

General aviation is defined as that portion of aviation activity which encompasses all facets of aviation except commercial airline and military operations and constitutes the majority of aircraft activity at the McClellan-Palomar 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 McClellan-Palomar Airport.

Once again, it is important to remember that the forecasts produced in this chapter are unconstrained forecasts, indicating that no constraints have been placed upon the growth of aviation activity due to physical facility limitations or management policies. These forecasts are based upon the demand within the service area, population projections, and historical trends. The rationale behind the general aviation activity forecast is presented below.

BASED AIRCRAFT

The number of based aircraft at McClellan-Palomar Airport is highly dependent upon the nature and magnitude of aircraft ownership in the general aviation service area. Preparation of based aircraft forecasts were initiated with a review of historical data on aircraft based at the airport, aircraft registered within the FAA's Western-Pacific Region (AWP), and active general aviation aircraft within the United States.

Historical data related to based aircraft was collected from several sources including FAA records and records kept by the airport sponsor and the fixed base operators. The average annual growth rate in based aircraft for McClellan-Palomar Airport during the period of 1980 to 1993 was 1.77 percent; however, over this 14 year period the number of based aircraft ranged from a high of 495 in 1993, to a low of 351 in 1992. The based aircraft totals reported in 1991 and 1992, however, are presumed under reported possibly due to an accounting error. It is anticipated that the "actual" number of based aircraft during these years would have been closer to 480 to 490. The historical based aircraft data for McClellan-Palomar Airport is presented in **Table 2B, Historical Based Aircraft.**

TABLE 2B
Historical Based Aircraft
McClellan-Palomar Airport

Year	Based Aircraft
1980	387
1981	411
1982	442
1983	367
1984	394
1985	413
1986	448
1987	428
1988	422
1989	447
1990	447
1991[1]	398
1992[1]	351
1993	495

Note: [1] These based aircraft totals are presumed to be under reported, possibly due to an accounting error.
Source: McClellan-Palomar Airport Administration

A trendline analysis of the based aircraft at McClellan-Palomar Airport for various time periods resulted in very poor to good correlation coefficients. The correlation coefficient ranged from a low of 0.38 to a high of 0.96. The resulting based aircraft forecasts utilizing trendline analyses are presented in **Table 2C, Forecast Based Aircraft.**

Linear regression analyzes were accomplished using population statistics of the General Aviation Service Area for McClellan-Palomar Airport. The historical and forecast population for the G.A. Service Area was utilized as the independent variable, while the historical based aircraft was the dependant variable. The results of this analysis is included in **Table 2C.**

Market share analysis was also evaluated for McClellan-Palomar Airport. The historical and forecast active general aviation aircraft in the United States and the AWP Region were compared to the historical based aircraft at McClellan-Palomar Airport. Based on the percentage of the aircraft based at McClellan-Palomar Airport to that in the AWP Region, the forecast market share of based aircraft for McClellan-Palomar Airport was determined. Assuming a constant market share throughout the planning period, the forecast results ranged from 504 in 1995 to 541 in the year 2015. The results of this market share analysis are included in **Table 2C.**

Another method used to determine market share is the ratio of based aircraft per 1,000 population in a specific region. Utilizing the G.A. Service Area historical and forecast population, based aircraft projections were determined. Over the last ten years the based aircraft per 1,000 population ratio has decreased from 2.53 in 1980 to 1.36 in 1993. This trend of based aircraft per 1,000 population decreasing is expected to continue throughout the planning period as the population within the service area increases at a greater growth rate than the number of based aircraft within the same region. It is anticipated that by the year 2015 the ratio will be 1.25. As a result, the projected based aircraft for the year 2015 is estimated to be 609. The results of this market share are included in **Table 2C.**

Forecasts from the National Plan of Integrated Airport Systems (NPIAS) was also reviewed. The forecast number of based aircraft in the NPIAS for 1995 and the year 2000 (351 and 355 respectively) were considerably lower than the existing number of based aircraft (495), therefore the data from this source was considered poor. The data from this source is presented in **Table 2C.**

Those other aviation related studies discussed earlier in this chapter that projected based aircraft numbers are also shown in **Table 2C.**

The selected based aircraft forecast indicated in **Table 2C,** illustrates a 1.00 percent average annual growth rate through the planning period. **Exhibit 2B, Based Aircraft Forecast,** illustrates the selected based aircraft forecast with the results from the other forecast methods.

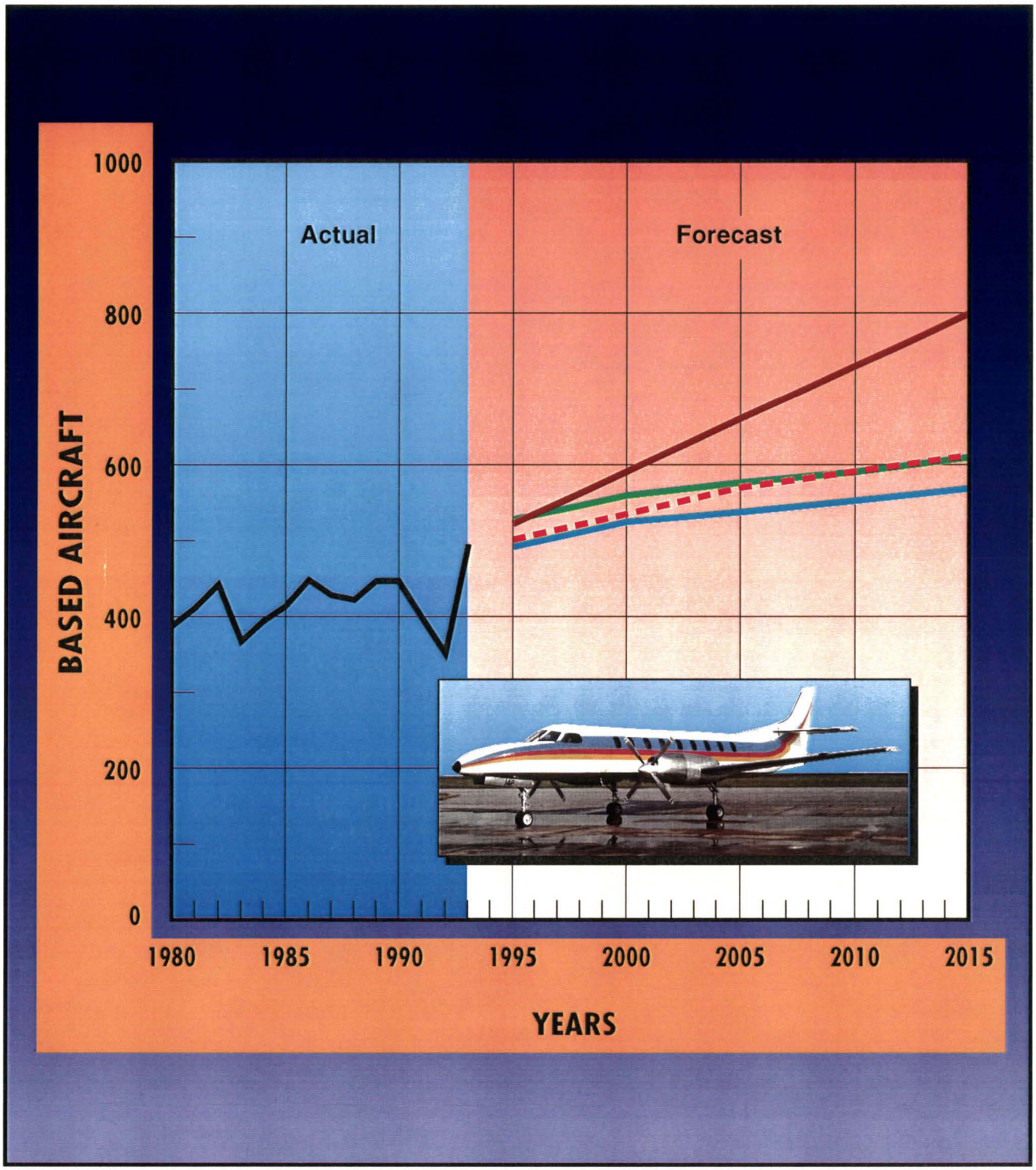
TABLE 2C
Forecast Based Aircraft
McClellan-Palomar Airport

	1995	2000	2005	2010	2015
Trendline Analysis					
1980-1990 (R^2=0.38)	470	495	521	546	571
1983-1990 (R^2=0.71)	505	554	604	654	703
1988-1993 (R^2=0.96)[1]	522	591	661	730	799
Linear Regression (Population vs. Based Aircraft)[2]					
G.A. Service Area (R^2=0.80)	491	524	537	552	568
Market Share Analysis of					
FAA Western-Pacific Region	504	513	512	530	541
per 1,000 population (G.A. Service Area)	527	559	576	590	609
Other Resources					
NPIAS 1990-1999	351	354	N/A	N/A	N/A
1989 FAR Part 150 Study	786	N/A	N/A	N/A	N/A
1989 CASP	485	523	563	N/A	N/A
1993 "Draft" RTP	N/A	N/A	584	N/A	N/A
Selected Forecast					
Forecast Based Aircraft	**501**	**535**	**570**	**591**	**610**

Notes: [1] Does not include 1991 or 1992 based aircraft data in calculation.
[2] Includes the population data for 1987-1990 and 1993.
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 McClellan-Palomar Airport was determined by an analysis of the types of aircraft historically and currently based at the Airport. This was compared with the FAA existing and forecast general aviation fleet mix. The fleet mix trend at McClellan-Palomar Airport is similar to that of the national trends, with a trend towards a slightly higher percentage of more sophisticated and higher performance aircraft in the future. The single engine aircraft percentage is expected to decrease from approximately 70 percent to 62 percent by the end of the planning period. The multi engine, turboprop, and turbojet percentage are expected to increase from 16 percent,



LEGEND:

- Trendline (1988-1993)
- G.A. Service Area
- Per 1,000 Population
- Selected Based Aircraft

McCLELLAN-PALOMAR AIRPORT

Exhibit 2B
BASED AIRCRAFT FORECAST

4.4 percent, 4.2 percent, respectively, to 19.5 percent, 7.2 percent, and 5.7 percent, respectively. Rotorcraft mix is also expected to increase from 3.2 percent to 3.7 percent. The existing and forecast fleet mix are shown in **Table 2D, Based Aircraft Fleet Mix Projections.**

TABLE 2D
Based Aircraft Fleet Mix Projections
McClellan-Palomar Airport

	Existing	Forecast				
Aircraft	1993	1995	2000	2005	2010	2015
Single Engine	346	350	360	369	375	379
Twin Engine	80	81	94	109	113	119
Turbo Prop	22	23	28	33	39	44
Jet	21	21	26	30	33	35
Rotorcraft	16	16	17	19	21	23
Other	10	10	10	10	10	10
Total	**495**	**501**	**535**	**570**	**591**	**610**

GENERAL AVIATION 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 McClellan-Palomar Airport has an air traffic control tower, actual operations data was utilized. In addition, other historical records were available from the airport records, and the FAA Terminal Area Forecast.

An historical trendline analysis for the period 1983-93 produced a poor correlation with a coefficient of 0.63. A projection of operations using the trendline analysis method is illustrated in **Table 2E, General Aviation Operations.**

Linear regression analysis of general aviation operations at McClellan-Palomar Airport was conducted using the population data for the General Aviation Service Area. This analysis resulted in a good correlation coefficient of 0.82. The forecast operation results from this analysis is indicated in **Table 2E.**

Another commonly used forecasting method for projecting general aviation operations is the use of a ratio of operations to based aircraft. Based on the 1983-1993 based

aircraft data for McClellan-Palomar Airport, the average operation per based aircraft was determined to be 508. Assuming this ratio to remain constant over the planning period, the general aviation operations were forecast for the 20-year period. The results are presented in **Table 2E.**

Also included in **Table 2E** are forecasts of operational levels produced in the National Plan of Integrated Airport Systems, 1990-1999, the FAA Terminal Area Forecast FY1993-FY2005, and the other aviation related studies discussed earlier in this chapter.

The selected forecast of general aviation activity is predicated on a 1.12 percent average annual growth rate from the 1993 total of approximately 203,000 to 260,000 by the end of the planning period, as shown on **Table 2E.** Operational activity will continue to be affected by the high cost of purchasing and operating general aviation aircraft. Itinerant operations are expected to remain at a high percentage of operations in the fleet mix at nearly 70 percent of total general aviation operations by the end of the planning period. The selected forecast illustrates a steady increase in the number of operations throughout the planning period and is graphically illustrated on **Exhibit 2C, General Aviation Operations.**

TABLE 2E
General Aviation Operations
McClellan-Palomar Airport

	1995	2000	2005	2010	2015
Trendline Analysis					
1983-1993 (R^2=0.63)	218,374	232,903	247,433	261,963	276,493
Linear Regression Analyses[1]					
G.A. Service Area (R^2=0.82)	213,848	220,933	223,962	227,202	230,669
Market Share Analysis					
Operations/Based Aircraft	254,508	271,780	289,560	300,228	315,976
Other Resources					
1989 CASP	251,668	277,932	307,731	N/A	N/A
1990 FAR Part 150 Study	326,000	N/A	N/A	N/A	N/A
1986 CLUP	N/A	N/A	326,000	N/A	N/A
1994 CLUP	290,000	N/A	N/A	N/A	N/A
1993 RTP	N/A	N/A	316,349	N/A	N/A
NPIAS 1990-1999	199,000	234,000	265,000	N/A	N/A
FAA Aviation Forecast - San Diego, November 1986	227,600	260,000	N/A	N/A	N/A
FAA TAF FY1993-FY2005	225,000	251,000	275,000	N/A	N/A
Selected Forecast					
Annual G.A. Operations	**216,000**	**225,000**	**235,000**	**247,000**	**260,000**

Notes: [1] Includes the population and operations data from 1983, 1986, 1989, and 1991-1993.
N/A - Not Available

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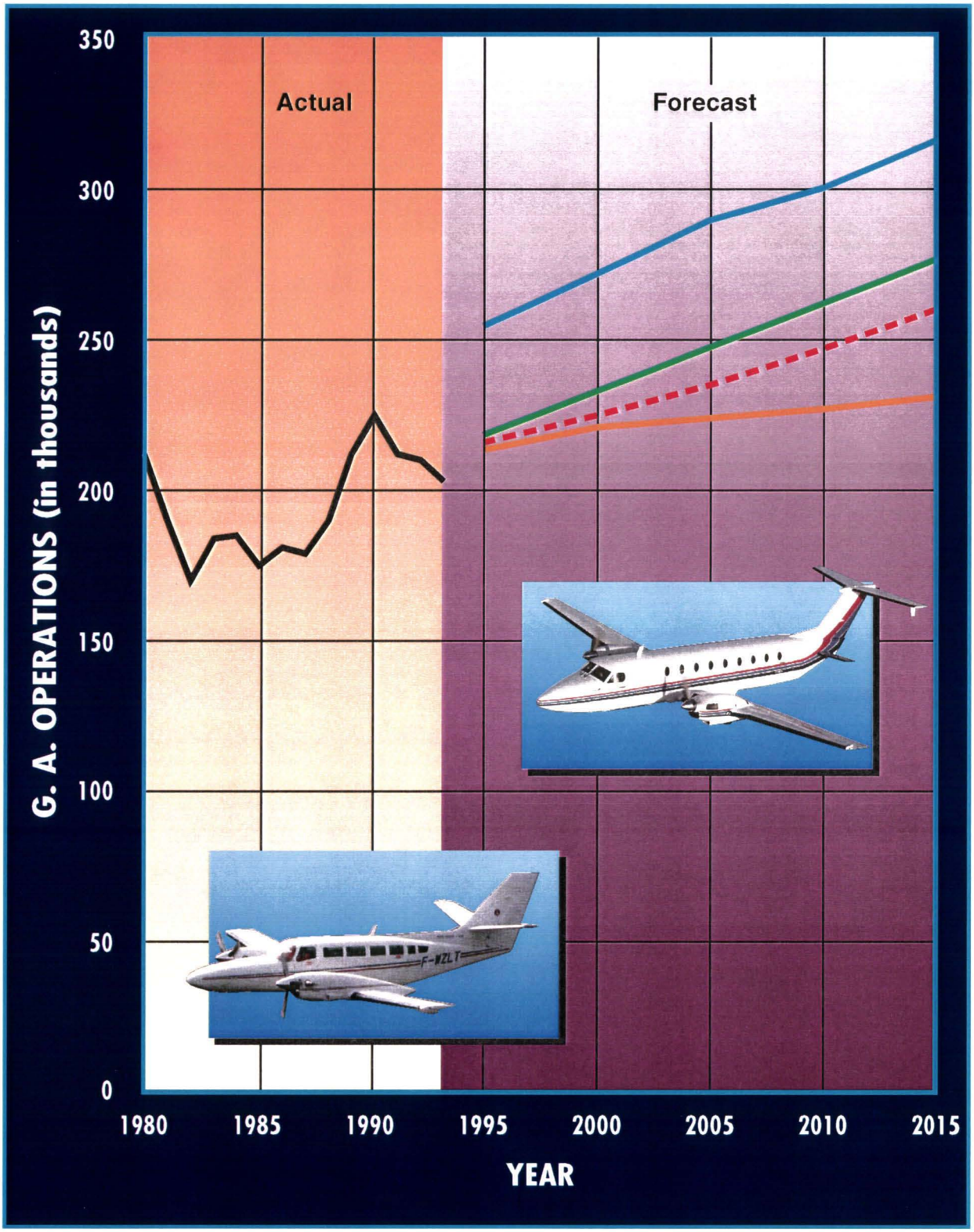

LEGEND:

- Trendline (1983-1993)
- G.A. Service Area
- Operations/Based Aircraft
- Selected G.A. Operations

McCLELLAN-PALOMAR AIRPORT

Exhibit 2C
GENERAL AVIATION OPERATIONS

MILITARY ACTIVITY FORECAST

Based on the FAA Air Traffic Control Tower (ATCT) records, military activity at McClellan-Palomar Airport has increased from approximately 1,600 operations in 1983 to approximately 2,800 in 1993. The majority of the military operations are instrument training flights conducted by helicopters and a variety of fixed-wing aircraft. The military operations are anticipated to remain relatively constant at 2,900 annual operations throughout the planning period. The forecast military operational level for the planning period are indicated in **Table 2F** and in **Table 2M** at the end of this chapter.

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 to the types of facilities needed at the airport (i.e. tiedowns, hangars, navigational aids, etc).

According to the ATCT logs, the general aviation operational split at McClellan-Palomar Airport in 1993 was approximately 66 percent itinerant and 34 percent local. Due to the tourism industry and the business activity in the surrounding area, it is anticipated that the current amount of itinerant operations would increase slightly to 70 percent by the end of the planning period.

The distribution of local versus itinerant operations for the planning period is illustrated in **Table 2F, Local Versus Itinerant Splits.**

TABLE 2F
Local Versus Itinerant Splits
McClellan-Palomar Airport

	Existing	Forecast				
Operations	1993	1995	2000	2005	2010	2015
Itinerant						
General Aviation	134,155	142,600	150,800	159,800	170,400	182,000
Military	2,721	2,800	2,800	2,800	2,800	2,800
Local						
General Aviation	69,338	73,400	74,200	75,200	76,600	78,000
Military	90	100	100	100	100	100
Total GA/Military Operations	**206,304**	**218,900**	**227,900**	**237,900**	**249,900**	**262,900**

COMMERCIAL SERVICE FORECAST

Airline activity into McClellan-Palomar Airport is provided by regional/commuter airlines. At the present time, the airport is being served by two commuter airlines; American Eagle and United Express. In 1993, both American Eagle and United Express operated 19-passenger Jetstream 31 aircraft. It is anticipated that American Eagle will begin utilizing 30-passenger Saab 340 aircraft during 1996.

The determination of commercial service forecast numbers for McClellan-Palomar Airport must be based upon a number of assumptions. This includes the assumption that Lindbergh Field (San Diego International Airport) can resolve any capacity issue that may exist, and secondly, the forecast assumes that there are no physical or policy constrains that would restrict the ability to accommodate the unconstrained commercial service forecasts.

In order to determine the type and size of facilities necessary to accommodate airline activity at any airport, several elements of this activity must be forecast. The two elements considered most important include *Annual Enplaned Passengers* and *Annual Commercial Service Operations*.

ANNUAL ENPLANED PASSENGERS

Enplaned passengers are those that board a commercial service aircraft for departure from the airport. This statistic is the most basic indicator of demand for airline activity.

The 1993 origin-destination data for McClellan-Palomar Airport was used to evaluate the top 20 markets. The top 20 markets for McClellan-Palomar Airport are presented in **Table 2G, Origin-Destination Data**. The data was comprised from a 10 percent passenger sampling of those passengers originating or final destination was McClellan-Palomar Airport. Of the top 20, there are nine destinations (Los Angeles, San Jose, San Luis Obispo, Fresno, Monterey, Santa Maria, Santa Barbara, San Francisco and Oxnard) located within the State of California. These eight destinations totaled approximately 60.5 percent of the total passengers to and from McClellan-Palomar Airport. Currently, the commuter airlines serving McClellan-Palomar Airport only operate to and from Los Angeles International Airport (LAX). It would appear that destinations other than Los Angeles could potentially generate a demand for direct service from McClellan-Palomar Airport.

TABLE 2G
Origin-Destination Data
McClellan-Palomar Airport

Ranking/Destination		Passengers	% of Total Passengers
1.	Los Angeles	946	44.92
2.	Boston	169	8.02
3.	San Jose	163	7.74
4.	Newark	140	6.65
5.	Washington, D.C.	128	6.08
6.	New York, John F. Kennedy	105	4.99
7.	Honolulu	98	4.65
8.	Dallas/Ft. Worth	54	2.56
9.	San Luis Obispo	51	2.42
10.	Miami	44	2.09
11.	Chicago	43	2.04
12.	Fresno	34	1.61
13.	Kahului	28	1.33
14.	Monterey	23	1.09
15.	Santa Maria	23	1.09
16.	Santa Barbara	19	0.90
17.	New York, La Guardia	15	0.71
18.	Seattle	8	0.38
19.	San Francisco	8	0.38
20.	Oxnard	7	0.33

Note: 10 percent sampling of the 1993 passenger data
Source: USDOT; BACK Information Services

To develop new enplanement forecasts, several of the analytical techniques outlined previously were examined for their applicability. These include historical trend analyses, regression analyses, market share analyses, and a review of other sources.

A trendline forecast based upon available historical enplanement data produced a excellent correlation (R^2=0.99), which was expected considering the relatively steady increase in enplanements during the past three years. The forecast resulting from the trendline analysis is provided in **Table 2H, Forecast Enplanements.**

One of the more common forecasting practices involves linear regression analysis with population as the independent variable. The C.S. Service Area was analyzed in an attempt to obtain high correlation upon which to make future

projections. The correlations proved to be excellent, and the resulting forecast is indicated in **Table 2H.**

Enplanement forecast from the FAA Terminal Area Forecast, FY1993-FY2005 was also examined. The results of this study project enplanement levels through the year 2005. The results from this forecast are included in **Table 2H.**

The selected enplanement forecast indicated in **Table 2H** is predicated on a 7.1 percent average annual growth rate from the 1993 total of 14,455 to 65,000 in the year 2015. The larger percentage of annual growth is in the short-term, due to the ability of the airlines to attract additional users in the service area. In the long-term, however, it is expected that the growth rate will level off. **Exhibit 2D, Enplanements,** illustrates the selected forecast, however, as stated earlier one should not assume a high level of confidence in those forecasts developed beyond the first five years due to the impacts of outside forces on the airline industry (e.g. economy, political changes, changes in technology, etc.).

Both the national economy and airline industry will be major factors that influence the enplanement forecast. Although the national, state and local economies are slowly recovering from the recent recession, the airline industry is struggling and dramatic changes in the airline structure may occur in the future. The factors that affect airline operations will directly impact enplanement forecasts. It is important to note, however, that the most stable portion of the airline industry has occurred in the regional/commuter air carrier segment, an airline segment which serves the McClellan-Palomar Airport area. With continued improvement in the economy and balance within the airline industry, enplanement growth at the McClellan-Palomar Airport should be expected to continue through the planning period.

TABLE 2H
Forecast Enplanements
McClellan-Palomar Airport

	1995	2000	2005	2010	2015
Trendline Analysis					
1991-1993 (R^2=0.99)	21,376	38,611	55,846	73,081	90,316
Linear Regression[1]					
C.S. Service Area (R^2=1.00)	19,927	36,664	45,291	54,552	64,502
Other Studies					
1986 FAA Aviation Forecasts, San Diego	46,000	52,600	N/A	N/A	N/A
FAA Terminal Area Forecasts FY1993-FY2005	11,000	13,000	16,000	N/A	N/A
Selected Forecast					
Annual Enplanements	**19,000**	**33,000**	**45,000**	**55,000**	**65,000**

Notes: [1] Includes population data from 1991-1993
N/A - Not Available

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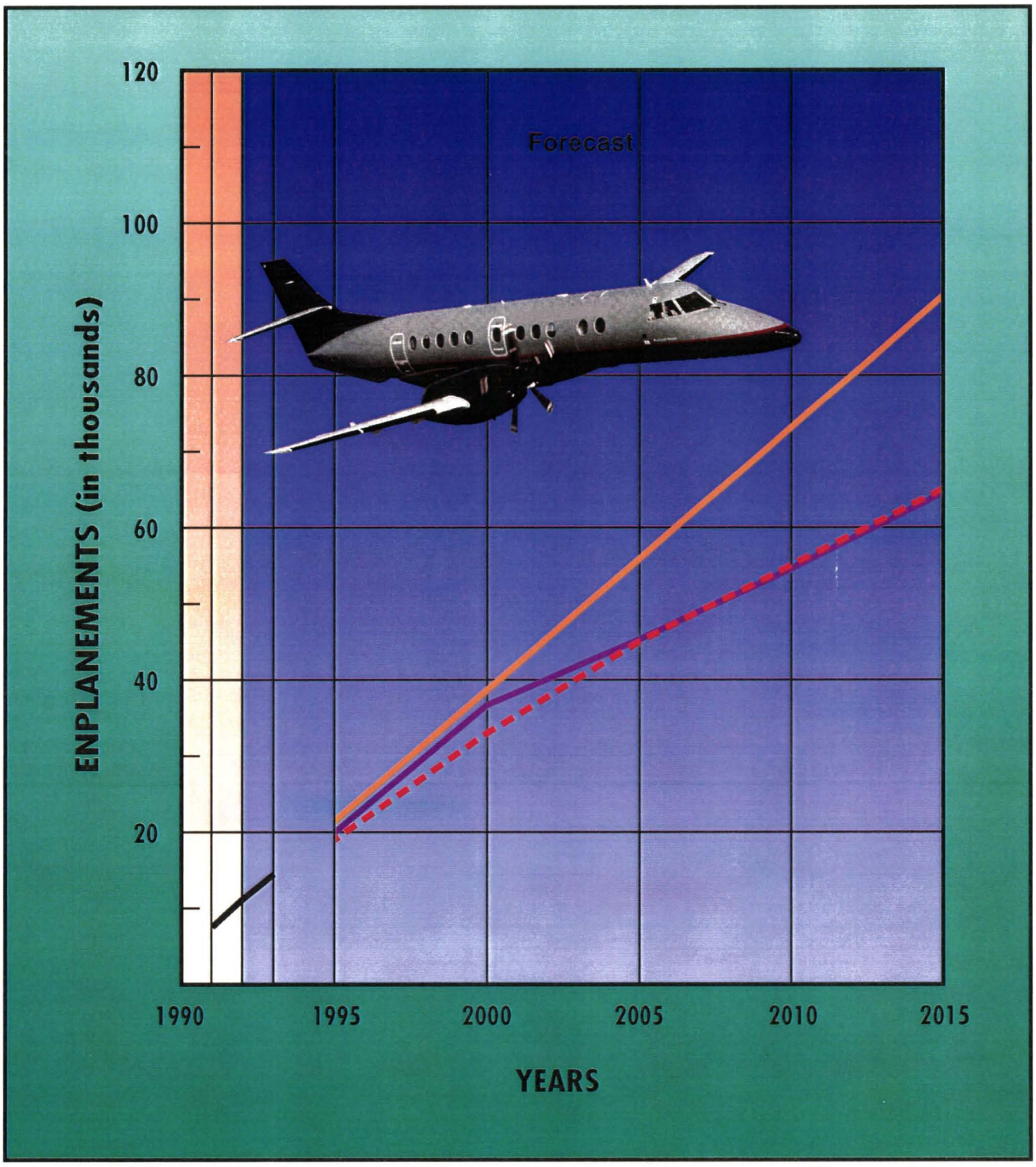

LEGEND:

Trendline (1991-1993)

C.S. Service Area

Selected Enplanement Forecast

McCLELLAN-PALOMAR AIRPORT

Exhibit 2D
ENPLANEMENTS

ANNUAL COMMERCIAL SERVICE OPERATIONS AND FLEET MIX

In addition to passenger enplanements, there are other factors which affect forecasts of airline facilities. The number of airline operations can be determined from the average ratio of passenger enplanements per departure. This ratio is dependent upon the size of the aircraft and the average percentage of seats that are filled for each departure. The percentage of enplanements to available seats is called the *Boarding Load Factor* (BLF).

The BLF is important to airline companies because it serves as a measure of airline profit from a given market. When the BLF is high, an airline will often consider increasing the number of seats or the number of flights available. The BLF, the type of aircraft and the number of aircraft available, determine an airline's marketing strategy.

According to the *FAA Aviation Forecasts, 1994-2005*, between 1993 and 2005, the average number of seats per aircraft for regional/commuter airlines in the United States is forecast to be between 22.9 and 35.5, with an average BLF between 48.7 and 49.8 percent. This would result in an average 7.5 percent growth in annual enplanements by regional/commuter airlines in the United States. The BLF for McClellan-Palomar Airport has historically been lower than the national average and has been projected to increase from 43 to 54 percent during the planning period. **Table 2J, Commercial Airline Fleet Mix and Operations**, depicts the anticipated airline operations based on various seating capacities of commercial aircraft. **Exhibit 2E, Operations Forecast Summary**, presented at the end of the chapter illustrates the projected commercial service operations throughout the planning period. One must realize, that the enplanements and operational levels identified for commercial service activity is unconstrained. The existing physical and policy constraints are not reflected in this forecast.

TABLE 2J
Commercial Airline Fleet Mix and Operations
McClellan-Palomar Airport

	Existing	FORECAST				
	1993	1995	2000	2005	2010	2015
Seating Capacities						
±19 (Jetstream, Beech 1900)	100%	95%	80%	75%	70%	65%
±30 (Brazilia)	0%	5%	20%	25%	30%	34%
±70 (Regional Jet)	0%	0%	0%	0%	0%	1%
≥71 (Commercial Jets)	0%	0%	0%	0%	0%	0%
Total	100%	100%	100%	100%	100%	100%
Average Seats, Enplanement and Commercial Operations Forecasts						
Average Seats per Departure	19	20	21	22	22	23
Boarding Load Factor	43%	46%	48%	50%	52%	54%
Enplanements per Departures	8.2	9.2	10.1	11.0	11.4	12.4
Annual Enplanements	14,455	19,000	33,000	45,000	55,000	65,000
Annual Departures	1,763	2,065	3,267	4,091	4,825	5,242
Annual Commercial Operations	**3,526**	**4,130**	**6,534**	**8,182**	**9,650**	**10,484**
Annual Air Taxi Ops	**7,909**	**8,776**	**12,683**	**14,546**	**15,745**	**15,726**

AIR TAXI OPERATIONS

Air Taxi activity (an operator certified in accordance with Federal Aviation Regulation (FAR) Part 135 and authorized to provide, on demand, public air transportation of persons or property for hire, using small aircraft) at McClellan-Palomar Airport in 1993 accounted for 7,909 operations. This is approximately 69 percent of the total commercial operations. It is anticipated that this percentage will decrease slightly to approximately 60 percent by the end of the planning period. This would be expected due to the increased and improved commuter operations. The forecast of the air taxi operations were presented in **Table 2J**.

ANNUAL INSTRUMENT APPROACHES

Forecasts 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.*"

In determining the number of AIA's conducted at the airport, the number of instrument operations needed to be examined. Utilizing the 1993 Air Traffic

Control Tower activity logs, it was determined that 65 percent of the airline and air taxi operations, 52 percent of the military operations, and 28 percent of itinerant general aviation operations were logged as instrument operations. These operations included actual instrument operations and instrument training activity.

Instrument weather condition in the McClellan-Palomar Airport area occur approximately 10 percent of the time.

Utilizing the number of instrument operations determined, the number of AIA's were calculated for the planning period. The number of AIA's are expected to increase gradually throughout the planning period as commercial operations increase and more sophisticated general aviation aircraft operate at the airport. The forecast of AIA's at the airport are described in **Table 2K, Annual Instrument Approach Forecast.**

TABLE 2K
Annual Instrument Approach Forecast
McClellan-Palomar Airport

	Existing	Forecast				
	1993	1995	2000	2005	2010	2015
Annual Operations	217,739	231,800	247,117	260,628	275,295	289,110
Annual Instrument Approaches	2,284	2,491	2,811	3,018	3,256	3,462

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.

GENERAL AVIATION PEAKING CHARACTERISTICS

The general aviation peaking characteristics at McClellan-Palomar Airport were estimated from an analysis of estimated monthly operations in the year 1993. The

peak month, August, was approximately 9.2 percent of annual general aviation operations. For planning purposes, the peak month has been projected to remain at 9.2 percent of annual general aviation operations throughout the planning period.

The Design Day will vary depending on the number of operations during the peak month. At McClellan-Palomar Airport, the average day was determined by dividing the peak month operations by 31 (the number of days in the peak month).

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

The definition of general aviation passengers (Design Hour Passengers), as used in this section, refers to the average number of pilots and passengers expected to utilize the 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. According to Air Traffic Control logs, approximately 33 percent of the general aviation operations are training in nature. In order to ensure that space requirements are not overestimated in the planning effort, these operations were not considered in determining design hour passengers. In calculating the design hour passengers, an average of 2.5 passengers per design hour operation, excluding training operations, was assumed for the existing condition. It is anticipated that this assumption would remain constant throughout the planning period.

COMMERCIAL SERVICE PEAKING CHARACTERISTICS

For this analysis, commercial service peaking characteristics has been divided into two sections; enplanements and operations. The commercial service peaking characteristics are described in the following paragraphs.

Enplanement Peaking Characteristics

According to 1993 enplanement data, the peak month for enplaned passengers occurs in the month of April with approximately 10.0 percent. For planning purposes, the peak month is projected to remain relatively constant at 10.0 percent throughout the planning period.

The Design Day, also referred to as the average day of the peak month, will vary from year to year depending on the number of enplanements during the peak month. At McClellan-Palomar Airport, the design day enplanements were determined by dividing the peak month enplanements by 30 (the number of days in the peak month).

Design Hour enplanements are used to establish peak hourly demand affecting terminal facilities. The Design Hour enplanements at McClellan-Palomar Airport are affected by the airline schedules. By the end of the planning period, the percentage is expected to be 15 percent of the Design Day.

The forecast of enplanement peaking characteristic at McClellan-Palomar Airport are presented in **Table 2L, Forecast Peaking Characteristics.**

Commercial Service Operation Peaking Characteristics

According to the 1993 commercial service operational data, the peak month for commercial service operations occurred in the month of July with approximately 10.4 percent of the total. As with the enplanement peaking characteristics, this percentage is expected to remain relatively constant at 10.4 percent throughout the planning period.

The Design Day percentage was determined by dividing the peak month commercial operations by 31 (the number of days in the peak month).

Current Design Hour operations were estimated to be 10.0 percent of the Design Day operations. This percentage is expected to remain constant throughout the planning period. The commercial operation peaking characteristics for commercial service are depicted in **Table 2L, Forecast Peaking Characteristics.**

The peaking characteristics were applied to the forecasts of general aviation operations, annual enplanements, and annual commercial service operations to obtain future peaking data at McClellan-Palomar Airport. A summary of the total, commercial service, and general aviation peaking characteristics are presented in **Table 2L, Forecast Peaking Characteristics.**

TABLE 2L
Forecast Peaking Characteristics
McClellan-Palomar Airport

	Existing	Forecast				
	1993	1995	2000	2005	2010	2015
Total Operations (including Commercial Service, Air Taxi, General Aviation, and Military)						
Annual	217,739	231,800	247,117	260,628	275,295	289,110
Peak Month	20,128	21,542	23,027	24,251	25,632	26,913
Design Day	649	695	743	782	827	869
Design Hour	96	103	109	114	120	126
General Aviation Operations						
Annual	203,493	216,000	225,000	235,000	247,000	260,000
Peak Month	18,702	19,872	20,700	21,620	22,724	23,920
Design Day	603	641	668	697	733	772
Design Hour	90	96	100	105	110	116
General Aviation Pilot/Passengers						
Design Hour Pilot/Passengers	150	161	168	176	184	194
Commercial Service Operations (includes Air Taxi)						
Annual	11,435	12,906	19,217	22,728	25,395	26,210
Peak Month	1,191	1,342	1,999	2,364	2,641	2,726
Design Day	40	45	67	76	85	88
Design Hour	4	5	7	8	9	9
Passengers Enplanements						
Annual	14,455	19,000	33,000	45,000	55,000	65,000
Peak Month	1,444	1,900	3,300	4,500	5,500	6,500
Design Day	48	63	110	150	183	217
Design Hour	7	10	17	23	27	33

SUMMARY

This chapter has provided unconstrained forecasts for those indicators of aviation demand that are essential to effective analysis of future facility needs of the McClellan-Palomar 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 meet future aviation demands. **Table 2M, Summary of Unconstrained Forecasts,** is provided as a summary of forecast information for referral in later portions of the study. **Exhibit 2E, Operations Forecast Summary,** graphically illustrates the forecast operations by category.

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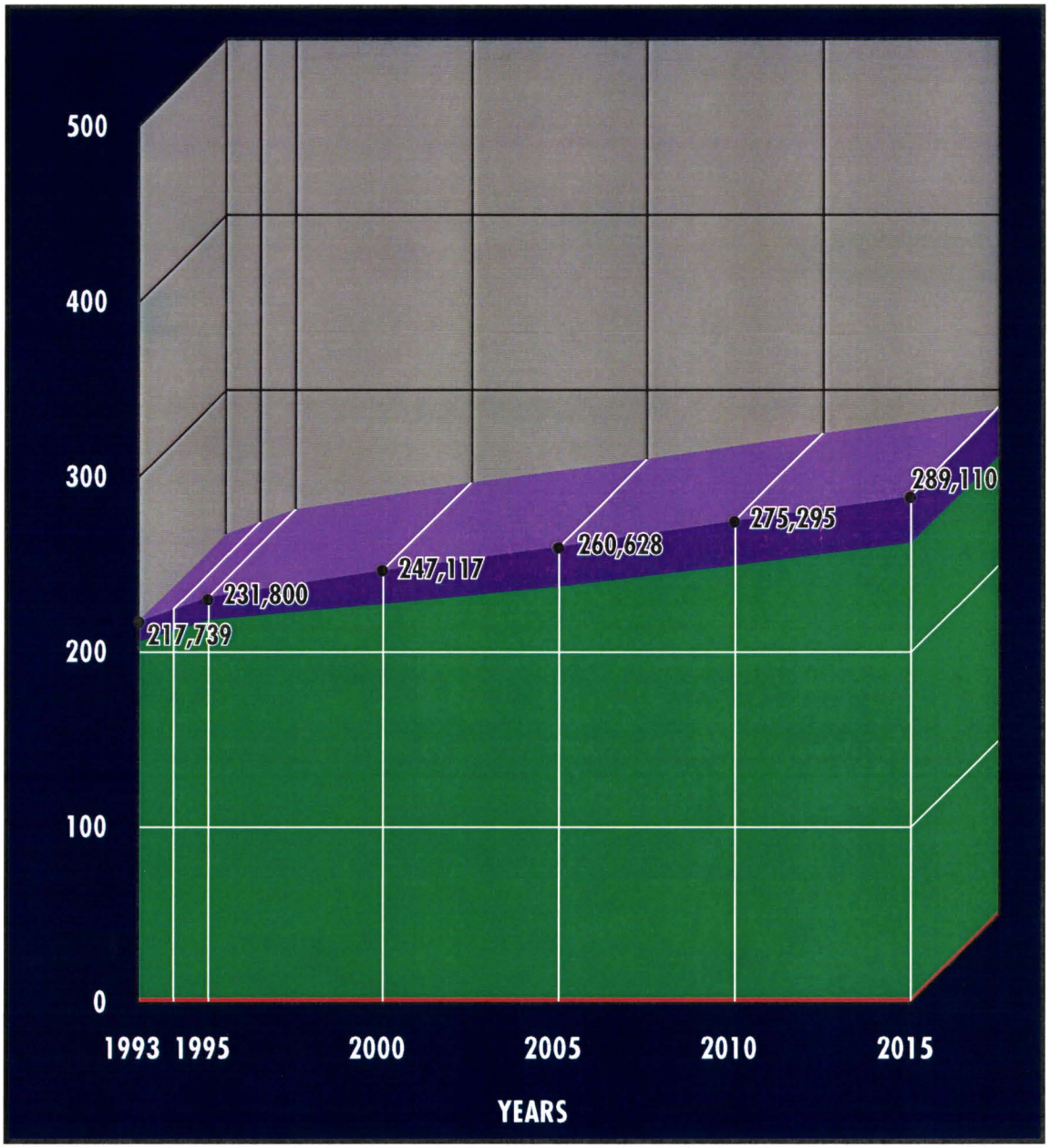
ANNUAL OPERATIONS
(in thousands)



LEGEND:

Commuter/Air Taxi | General Aviation | Military

McCLELLAN-PALOMAR AIRPORT

Exhibit 2E
OPERATIONS FORECAST SUMMARY

TABLE 2M
Summary of Unconstrained Forecasts
McClellan-Palomar Airport

	Existing	Forecast				
	1993	1995	2000	2005	2010	2015
Based Aircraft						
Single Engine	346	350	360	369	375	379
Multi Engine	80	81	94	109	113	119
Turbo Prop	22	23	28	33	39	44
Jet	21	21	26	30	33	35
Rotorcraft	16	16	17	19	21	23
Other	10	10	10	10	10	10
Total Based Aircraft	**495**	**501**	**535**	**570**	**591**	**610**
Annual Itinerant Operations						
Commercial	3,526	4,130	6,534	8,182	9,650	10,484
Air Taxi	7,909	8,776	12,683	14,546	15,745	15,726
General Aviation	134,155	142,600	150,800	159,800	170,400	182,000
Military	2,721	2,800	2,800	2,800	2,800	2,800
Itinerant Ops Subtotal	**148,311**	**158,306**	**172,817**	**185,328**	**198,595**	**211,010**
Annual Local Operations						
General Aviation	69,338	73,400	74,200	75,200	76,600	78,000
Military	90	100	100	100	100	100
Local Ops Subtotal	**69,428**	**73,500**	**74,300**	**75,300**	**76,700**	**78,100**
Total Annual Operations	**217,739**	**231,800**	**247,117**	**260,628**	**275,295**	**289,110**
Passenger Enplanements						
Annual Enplanements	**14,455**	**19,000**	**33,000**	**45,000**	**55,000**	**65,000**
Annual Instrument Approaches	2,284	2,491	2,811	3,018	3,256	3,462

McCLELLAN-PALOMAR
A·I·R·P·O·R·T

Chapter Three

DEMAND / CAPACITY

Chapter Three

McCLELLAN-PALOMAR AIRPORT

DEMAND/CAPACITY

In the previous chapter, forecasts of unconstrained aviation demand were presented for McClellan-Palomar Airport through the year 2015. These forecasts include airport operations, annual enplanements, based aircraft, peaking characteristics, and aircraft fleet mix. With this information, the capability of the airfield can be evaluated to determine if it is adequate to accommodate the forecast aviation demands without significant delay or deterioration of service levels.

The demand/capacity analysis provides a basis to assess the capability of the existing airport facilities to accommodate current and future levels of activity. Analysis of this relationship results in the identification of deficiencies that can be alleviated through planning and development activities.

AIRFIELD CAPACITY

METHODOLOGY

An airfield capacity analysis for McClellan-Palomar Airport was conducted to determine the existing capacity of the airfield and to identify any present or potential deficiencies in the airfield system. Capacity and delay will be examined in this master plan using *FAA Advisory Circular (AC) 150/5060-5, Airport Capacity and Delay*. The methodology presented in this advisory circular and utilized here produces statement of airfield capacity in these major 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 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, including airfield layout, meteorological conditions, aircraft mix, runway use, percent arrivals, percent touch-and-go's, and exit taxiway locations. Each of these elements and their impact on airfield capacity are discussed in the following paragraphs.

Airfield Layout

The airport layout refers to the location and orientation of runways, taxiways and the terminal area. The layout of McClellan-Palomar Airport, as illustrated on **Exhibit 1D**, consists of a single runway oriented east-west. Runway 6-24 has a parallel taxiway and four connecting taxiways. All landside facilities are located on the southside of the runway/taxiway system.

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.

The *Airfield Capacity and Delay Advisory Circular (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 McClellan-Palomar Airport, VFR conditions occur approximately 90 percent of the time and IFR conditions occur the remaining 10 percent. PVC conditions occur approximately one percent of the time at McClellan-Palomar Airport. The annual percentage of VFR, IFR, and PVC conditions for McClellan-Palomar Airport was estimated from historical weather data.

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. Classes C and D consist of large jet and propeller aircraft generally associated with airline and military use. The aircraft operational mix used in calculating the capacity of McClellan-Palomar Airport, based upon the forecasts of aviation demand, is presented in **Table 3A, Aircraft Operational Mix Forecast.**

93MP12-3A-6/10/94

AIRFIELD CAPACITY

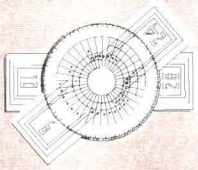
1 INPUT

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

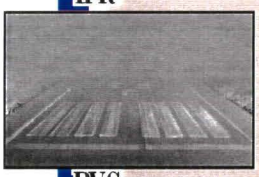
2 PROCESS

Wind & Weather

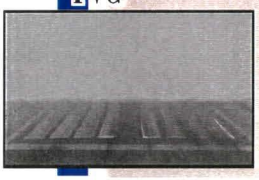
VFR



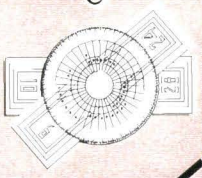
IFR

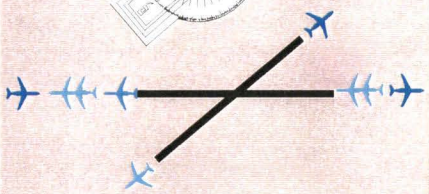


PVC

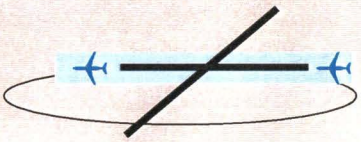


Runway Configuration

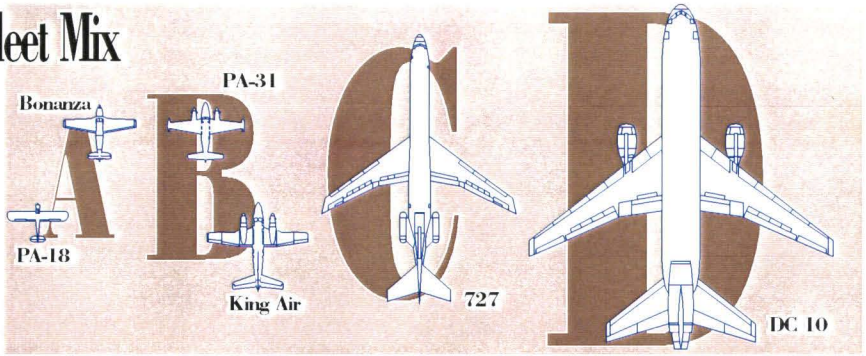




Touch & Go Factor

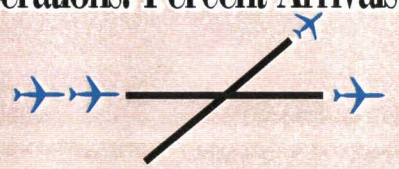


Fleet Mix



Exit Factor

Operations: Percent Arrivals



3 OUTPUT

Runway Hourly Capacity
Annual Aircraft Delay

ANNUAL SERVICE VOLUME

McCLELLAN-PALOMAR AIRPORT

Exhibit 3A
DEMAND/CAPACITY
METHODOLOGY FACTORS

TABLE 3A
Aircraft Operational Mix Forecast
McClellan-Palomar Airport

	Existing	Forecast				
	1993	1995	2000	2005	2010	2015
Aircraft Classification						
Class A	71%	71%	69%	67%	65%	62%
Class B	16%	16%	16%	17%	17%	19%
Class C	13%	13%	15%	16%	18%	19%
Class D	0%	0%	0%	0%	0%	0%

Definitions	
Class A:	Small single-engine, gross weight 12,500 pounds or less. Examples include: Cessna 172/182, Mooney 201, Beech Bonanza, and Piper Cherokee/Warrior.
Class B:	Small, twin-engine, gross weight 12,500 pounds or less. Examples include: Beach 1300, Cessna 402, Lear 25, Mitsubishi MU-2, Piper Navajo, Rockwell Shrike, Beech 99, and Cessna Citation.
Class C:	Large aircraft, gross weight 12,500 pounds to 300,000 pounds. Examples include: Beech King Air 200, Gulfstream III, Citation II, DeHavilland DH-8, Lear 35/55, Swearingen Metro, and Beech 1900.
Class D:	Large aircraft, gross weight more than 300,000 pounds. Examples include Lockheed L-1011, Douglas DC-8-60/70, Boeing 747, and 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 McClellan-Palomar Airport, there was no information that indicated a disproportionate share of arrivals to departures during peak periods; therefore, it was assumed that arrivals equal 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 33 percent of general aviation operations at McClellan-Palomar Airport. This

percentage is expected to decrease during the planning period to approximately 30 percent of total general aviation operations.

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 mix indexes determined for the planning period, only those exits located 2,000 and 4,000 feet off the runway ends qualify as exit taxiways in the capacity analysis. Using the mix index criteria, there is one qualified exit taxiways for approaches to Runway 6 and two for approaches to Runway 24.

CAPACITY ANALYSIS

The preceding information was used in conjunction with the airside capacity methodology developed by the FAA to determine airfield capacity for McClellan-Palomar Airport. From these results, 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.

HOURLY RUNWAY CAPACITY

The first step in capacity analysis involves the computation of an hourly runway capacity during VFR and IFR conditions. Because of increased separations required between aircraft under IFR conditions, 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 91 operations, as depicted in **Table 3B, Airfield Demand/ Capacity and Delay Summary.** This hourly capacity is expected to decrease by the end of the planning period to 86, if no further airfield improvements are provided.

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 existing weighted hourly capacity (C) for McClellan-Palomar Airport is 91 operations. The daily demand ratio (D) is determined by dividing the annual operations by average daily operations during the peak month. The hourly ratio (H) is 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 McClellan-Palomar Airport's existing configuration is 154,000 operations. This ASV indicates that the airport is currently operating at approximately 141 percent of the ASV and would be expected to reach an ASV of 144,600 or 202 percent by the year 2015.

ANNUAL DELAY

Even before an airport reaches the ASV, it begins to experience certain amounts of delay to aircraft operations. 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. According to the FAA model, with 217,739 annual operations for 1993 at McClellan-Palomar Airport, aircraft experience an average delay per aircraft operation of about 8.8 minutes. At peak periods, delays at McClellan-Palomar Airport can average between 30 minutes and one hour. At present operational levels, total annual delay to aircraft at McClellan-Palomar Airport is 31,935 hours. When the airport reaches 289,110 operations, as forecast for the year 2015, delays will average nearly 31.5 minutes per aircraft operations and will total 151,783 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 exceed three minutes per aircraft operation. Operations at McClellan-Palomar Airport currently exceed the ASV; therefore, some type of development that will increase the airport's capacity should be examined.

SUMMARY

Table 3B provides a summary of the operational capacity and delay analysis for McClellan-Palomar Airport. Airfield capacity at McClellan-Palomar Airport is inadequate throughout the planning period; therefore, airport capacity improvements will be needed in the short-term. As discussed in the previous chapter, there are management policies and other issues that will needed to be considered. The feasibility of providing capacity enhancements at McClellan-Palomar Airport will be examined in **Chapter Five, Development Alternatives.** The following chapter will identify those facilities that are needed to support the unconstrained forecast.

TABLE 3B
Airfield Demand Capacity and Delay Summary
McClellan-Palomar Airport

	Existing	Forecast				
	1993	1995	2000	2005	2010	2015
Annual Operations	217,739	231,800	247,117	260,628	275,295	289,110
Weighted Hourly Capacity	91	91	91	90	88	86
Annual Service Volume (ASV)	154,000	151,000	153,000	151,000	149,000	144,600
Percentage of ASV	141%	154%	162%	173%	185%	200%
Average Delay per Operation (Minutes)	8.8	12.5	18.0	20.7	29.4	31.5
Total Annual Delay (Hours)	31,935	48,292	74,135	89,917	134,895	151,783

McCLELLAN-PALOMAR
A·I·R·P·O·R·T

Chapter Four
FACILITY REQUIREMENTS

Chapter Four

McCLELLAN-PALOMAR AIRPORT

FACILITY REQUIREMENTS

To properly plan for the future of McClellan-Palomar Airport, it is necessary to convert forecast aviation demand into the specified types and quantities of facilities that can adequately serve this identified demand. This chapter uses the results of the demand/capacity analyses conducted in Chapter Three and established planning criteria to determine the airside (i.e., airfield capacity, runways, taxiways, navigational aids, marking and lighting) and landside (i.e., hangars, terminal buildings, aircraft parking apron, fueling, automobile parking, and access) facility requirements.

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

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 FAA has established criteria for use in the sizing and design of airfield facilities. The selection of the appropriate FAA design standards for the development of airfield facilities is based primarily upon the characteristics of the aircraft which are expected to use the airport. The most important characteristics in airfield planning

are the approach speed and the wingspan of the critical design aircraft anticipated to use the airport now or in the future. Planning for future aircraft use is particularly important because design standards are used to plan separation distances between facilities that could be extremely costly to relocate at a later date.

The FAA standards include airport design criteria relating to the size of an aircraft as well as its performance and speed. According to *FAA Advisory Circular (AC) 150/5300-13, Airport Design*, an aircraft's approach category is based upon 1.3 times its stall speed in the landing configuration at the particular aircraft's maximum certificated weight. The five approach categories used in airport planning are described below.

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 larger jet and propeller aircraft generally associated with commercial and military use.

The second basic design criteria relates to the size of an airplane. The Airplane Design Group (ADG) is based upon wingspan. The six groups are as follows.

Group I: Up to but not including 49 feet.

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

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

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

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

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

FAA AC 150/5300-13, Airport Design, identifies a coding system which is used to relate airport design criteria to the operational and physical characteristics of the airplanes intended to operate at the airport. This code, called the Airport Reference Code, has two components: operational and physical characteristics. The first characteristic is the aircraft approach category, defined above, and is depicted by a letter; the second is the airplane design group, also defined above, and is depicted by a Roman numeral.

In general, one type of aircraft may determine runway length, while another may determine runway pavement strength or other appropriate design parameters. Typically, aircraft approach speed applies to runways and runway-related facilities, while airplane design group categories primarily relates to separation criteria involving taxiways and taxilanes. In order to determine facility requirements for the design of an airport, the Airport Reference Code (ARC) should first be determined so that the airport design criteria contained within AC 150/5300-13 can be applied.

The FAA recommends designing airport functional elements to meet the requirements of the most demanding ARC for that airport. Corporate jet aircraft currently utilizing McClellan-Palomar Airport fall into Category C and D or below (approach speeds of less than 166 knots). Most general aviation and commuter airline aircraft using the facility fit into Groups I and II (wingspans less than 79 feet), however, the trend for newer business aircraft is towards larger Group III aircraft (i.e., Gulfstream V or aircraft with wingspans less than 118 feet). In addition, there are large Group III aircraft (i.e., Convair 580) currently based at McClellan-Palomar Airport. As a result, it is recommended that design standards at McClellan-Palomar Airport conform to the requirements of an ARC of D-III. Such design standards will provide a primary runway which accommodates approach category D aircraft, and provides separation distances between airfield elements which accommodates Design Group III aircraft.

The airfield facility requirements outlined in this chapter correspond to the design standards described in FAA's AC 150/5300-13, Airport Design. The following sections describe the scope of facilities that would be necessary to accommodate the airport's role throughout the planning period.

RUNWAY

The adequacy of the existing runway system was analyzed from a number of perspectives including runway orientation, airfield capacity, runway length, and pavement strength. From this information, requirements for runway improvements were determined for the McClellan-Palomar 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, with crosswind runways, may be required. The 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 in **Exhibit 1B**, Runway 6-24 meets the recommended wind coverage. There is no indication at this time that there is a demand or need for a crosswind runway at McClellan-Palomar Airport.

Airfield Capacity

The evaluation of airfield capacity presented in Chapter Three, Demand/ Capacity, outlined the capacity of the airport at current and future stages of the planning period. Operations at McClellan-Palomar Airport are currently at a level at which additional capacity should be given a priority consideration. The airport's annual service volume (ASV) is currently 154,000 operations, however, the estimated operational level is currently about 141 percent of the ASV. The unconstrained forecast levels for the year 2015 indicate that the airport will reach 200 percent of

the ASV. FAA Order 5090.3B, Field Formulation of the National Plan of Integrated Airport Systems (NPIAS) indicates that capacity improvements should be considered when operational levels reach 60 percent of the annual service volume; therefore, consideration should be given to provide additional airside capacity. As stated in the previous chapter, the most common means of providing increased airside capacity is a parallel runway. At McClellan-Palomar Airport, however, physical and policy constraints control the development of a parallel runway. The means in which additional capacity can be accomplished, including alternatives, will be examined in Chapter Five, Development Alternatives.

Runway Length, Width and Pavement Strength

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.

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 indicates that general aviation business jet aircraft influences the runway length requirements at McClellan-Palomar Airport.

Aircraft operating characteristics are affected by three primary factors. They are the mean maximum temperature of the hottest month, the airport's elevation, and the gradient of the runway. The mean maximum temperature of the hottest month is 77.7 degrees Fahrenheit. The airport elevation is 328 feet MSL and the runway gradient is 0.31 percent. Aircraft over 60,000 pounds are also affected by the length of haul (the distance from airport to airport).

Utilizing the FAA Computer Model for determining runway length requirements, **Table 4A** indicates that a runway length between approximately 4,700 feet and approximately 6,000 feet would be required to accommodate 75 percent of aircraft 60,000 pounds or less at useful loadings between 60 percent and 90 percent. Due to the physical and policy constraints, the potential of providing additional runway length will be further examined in the following chapter.

The runway should be capable of accommodating aircraft in design group D-III. This would resulting in a required runway width of 100 feet. The existing runway width is currently 150 feet and it is recommended that the 150 foot width be maintained. The existing runway pavement strength should be maintained at 60,000 pounds single wheel loading (SWL), in order to accommodate a wide variety of business jet aircraft.

TABLE 4A Runway Length Requirements McClellan-Palomar Airport	
RUNWAY LENGTHS RECOMMENDED FOR AIRPORT DESIGN	
Small airplanes with less than 10 passenger seats	
75 percent of these small airplanes	2,480 feet
95 percent of these small airplanes	3,020 feet
100 percent of these small airplanes	3,600 feet
Small airplanes with 10 or more passenger seats	4,110 feet
Large airplanes of 60,000 pounds or less	
75 percent of these large airplanes at 60 percent useful load	4,660 feet
75 percent of these large airplanes at 90 percent useful load	5,990 feet
100 percent of these large airplanes at 60 percent useful load	5,130 feet
100 percent of these large airplanes at 90 percent useful load	7,480 feet
Source: AC150/5325-4A, Runway length requirements for airport design.	

TAXIWAYS

Taxiways are constructed primarily to facilitate aircraft movements to and from the runway system. Some taxiways are necessary simply to provide access between apron and runways, whereas other taxiways become necessary as activity increases and safer and more efficient use of the airfield is needed. Parallel taxiways greatly enhance airfield capacity and are essential to aircraft movement about an airfield. At McClellan-Palomar Airport, Runway 6-24 is supported by a full-length parallel taxiway and four exit taxiways.

The construction of additional exit taxiways and a parallel taxiway to the north of the runway would provide a slightly higher airside capacity. The locations of these exit taxiways and the potential of providing an additional parallel taxiway will be examined in the following chapter.

MARKING AND LIGHTING

In order to facilitate the safe movement of aircraft about the airfield, particularly at night, airports use markings, lighting and signage to alert pilots as to their location. Runway markings are designed according to the type of approach available on the runway. Taxiway and apron areas are marked to assure that aircraft remain on the pavement. *FAA Advisory Circular 150/5340-1F, Marking of Paved Areas on Airports*, provides guidance necessary to design airport markings.

The runway at McClellan-Palomar Airport currently has precision and visual runway markings. These are utilized to identify Runway 24 as having precision approach capability and Runway 6 as having only visual capability. These markings would meet the marking requirements for the existing instrument approach capabilities.

If, however, additional navigational aids are installed (i.e., GPS), the runway markings will need to be updated according to the types of approaches established.

Airport lighting systems provide critical guidance to pilots during nighttime and low visibility operations. An airport is universally identified by a rotating beacon. Visible for several miles, the airport rotating beacon consists of an alternating white and green light to indicate a lighted, land airport. The existing rotating beacon at McClellan-Palomar Airport is located in the southwest general aviation area.

Visual glide path indicators are a system of lights located adjacent to the runway which provide visual guidance information during an approach to the runway. At McClellan-Palomar Airport, both ends of the existing runway are equipped with visual approach slope indicator (VASI) lights. It is recommended that these lights ultimately be replaced with the new state-of-the-art precision approach path indicators (PAPIs) during the planning period.

Runway end identifier lights (REILs) are installed to provide rapid and positive identification of the approach end of the runway. REILs consist of one high intensity flashing strobe light on each side of the threshold. These visual aids are most effective at airports located near cities where many ambient lights are prominent. REILs should be considered for all lighted runways not equipped with an approach lighting system. At McClellan-Palomar Airport, REILs are currently installed on Runway 24.

Runway 6-24 is currently equipped with high intensity runway edge lighting (HIRL), providing a pilot with further identification of the runway edge limits at night or in periods of low visibility. Runways with precision instrument approach capabilities are typically equipped with high intensity runway edge lighting (HIRL); therefore, since McClellan-Palomar Airport is anticipating the continued operation of precision instrument approach equipment, the existing HIRL on Runway 16-34 should be maintained.

Effective ground movement of aircraft at night also involves the use of taxiway lighting. Presently, medium intensity taxiway lighting (MITL) is provided along all taxiway edges. MITLs should be adequate throughout the planning period and should be provided on any new or extended taxiways.

Approach light systems provide positive visual alignment guidance to aircraft on final approach. the presence of an approach light system can effectively lower the minimums for an instrument approach. A medium intensity approach lighting system with runway alignment indicator lights (MALSR) is installed on Runway 24. This system should be maintained at McClellan-Palomar Airport.

Airfield signage provides another means of informing pilots as to their location on the airport. A system of signage strategically located at several locations on the airport is the method used to provide this guidance. Signs located at intersections of runways and taxiways provide crucial information to avoid conflicts between moving aircraft. Directional signage instructs pilots as to the location of taxiways and terminal aprons. Signage placed in accordance with FAA criteria can minimize pilot confusion and enhance airfield capacity. Most signage at McClellan-Palomar Airport does not meet FAA design standards and should be upgraded as soon as possible.

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, Airport Design*. Navigational aids provide visual, nonprecision or precision guidance to a runway(s) or to the airport itself. The basic difference between a nonprecision and precision navigational aid is that the latter provides electronic decent, alignment (course), and position guidance, while the nonprecision navigational aid provides only alignment and position location 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.

The existing navigational aid at McClellan-Palomar Airport consists of both precision and nonprecision instrument approach capabilities to Runway 24. The precision approach at McClellan-Palomar Airport is provided by the use of an instrument landing systems (ILS). An ILS provides an approach path for exact alignment and descent of an aircraft on final approach to a runway. The system provides three functions: guidance, provided vertically by a glide slope (GS) antenna and horizontally by a localizer antenna (LOC); range, furnished by marker beacons or distance measuring equipment (DME); and visual alignment, supplied by an approach lighting system and runway edge lights.

The ILS facility at McClellan-Palomar Airport provides precision approach capability in weather conditions as low as a 250 feet cloud ceiling and one mile visibility. Terrain and other obstacles in the vicinity of the airport are some of the determining factors used to establish ceiling and visibility limits. These considerations must be evaluated for there impact on providing both the required clearances required by Federal Aviation Regulation (F.A.R.) Part 77 and the integrity of the navigational signals.

A second type of precision instrument approach system is currently being tested by the FAA. The use of orbiting satellites to confirm an aircraft's location is the latest military development to be made available to the civil aviation community. Global positioning systems (GPS) uses two or more satellites to derive an aircraft's location by using triangulation. The accuracy of the systems has been remarkable, with initial degrees of error of only a few meters. As the technology improves, it is anticipated that GPS may be able to provide accurate enough position information to allow Category II and III precision instrument approaches, independent of any existing ground-based navigational facilities. In addition, it has been estimated that GPS equipment will be much less costly than existing precision instrument landing systems.

The FAA is currently in the process of flight testing nonprecision GPS approaches and is scheduled to commission thousands of GPS approaches on existing nonprecision approaches within the next year.

The FAA is also developing Category I precision instrument capability from GPS. This is anticipated to involve a differential GPS system that utilizes GPS ground monitors at known locations to determine errors in satellite signals and to transmit error correction messages. Current plans call for the establishment of CAT I GPS approaches beginning in 1998. For McClellan-Palomar Airport, GPS technology

is likely to provide a future means of gaining additional instrument approach capability. It is recommended that GPS nonprecision approaches be provided to both runway ends. In addition, GPS precision approach capabilities should be provided to Runway 24 when it becomes available.

Each of the airside facility requirements are presented in **Exhibit 4A, Airside Facility Requirements**, at the end of the chapter.

GENERAL AVIATION REQUIREMENTS

The purpose of this section is to determine the space requirements during the planning period for the following types of facilities normally associated with general aviation terminal areas.

- Hangars
- Local and Itinerant Apron
- General Aviation Terminal Building
- Vehicle Parking

HANGARS

The demand for hangar facilities typically depends on 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 McClellan-Palomar 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. T-hangars provide the aircraft owner more privacy and greater ease in obtaining access to the aircraft. 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.

For planning purposes, it was assumed that 50 percent of the single engine aircraft, 80 percent of the twin engine aircraft and 100 percent of the helicopters and turbine powered aircraft would desire hangars. It was also assumed that 30 percent of single engine, 60 percent of twin engine aircraft and 100 percent of the helicopters 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 jet 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 4B, Forecast Hangar and Hangar Apron Requirements, compares the existing hangar availability to the future hangar requirements at McClellan-Palomar Airport. As shown in **Table 4B**, the number of T-hangars needed by the end of the planning period is approximately twice the number currently available. Similarly, the amount of conventional hangar space needed by the end of the 20-year planning period is nearly three times the amount currently available.

TABLE 4B
Forecast Hangar and Hangar Apron Requirements
McClellan-Palomar Airport

	Available	1993	1995	2000	2005	2010	2015
Based Aircraft[1]	N/A	485	491	525	560	581	602
Aircraft to be Hangared							
Single Engine	N/A	173	175	180	184	188	190
Multi Engine	N/A	64	65	75	87	90	95
Turboprop	N/A	22	23	28	33	39	44
Business Jet	N/A	21	21	26	30	33	35
Rotorcraft	N/A	16	16	17	19	21	23
Total	N/A	296	300	326	353	371	387
T-Hangar Positions	110	147	149	156	164	168	171
T-Hangar Area (SF)	N/A	220,500	223,500	234,000	246,000	252,000	256,500
Conventional Hangar Positions	N/A	149	151	170	189	203	216
Aircraft Storage Area (SF)	N/A	237,500	244,500	282,000	318,000	345,500	369,500
Aircraft Maintenance Area (SF)	N/A	45,800	46,800	51,600	56,400	59,800	62,600
Total Conventional Hangar Area (SF)	150,000	283,300	291,300	333,400	374,400	405,300	432,100

Notes: N/A - Not Applicable
[1] Does not include those aircraft in the Other category (i.e., balloons, gliders, etc.)

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 McClellan-Palomar Airport, the local and transient aircraft are parked in different areas, the transient parking to the east of the general aviation terminal building and the local parking adjacent the hangar facilities. There are currently 136 local tiedown spaces and 104 transient spaces at the 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 (and/or uncovered) based aircraft. The number of based aircraft requiring local tiedown facilities was determined and the results depicted in **Table 4C, Forecast Apron Requirements.** There are not a sufficient number of local tiedowns at McClellan-Palomar Airport to meet the demand. Additional local tiedowns will be needed in the short-term.

Transient parking requirements can be determined from a knowledge of busy-day operations. The number of transient spaces required at McClellan-Palomar Airport was determined to currently be 30 percent of

the busy-day general aviation itinerant operations due to the nature of the airport. A planning criterion of 300 square yards (SY) per local aircraft and 360 SY per transient aircraft was used for the analysis presented in **Table 4C**. As shown, there are not a sufficient number of transient tiedowns available to meet the projected demand. Additional transient tiedowns will be needed in the short-term.

TABLE 4C
Forecast Apron Requirements
McClellan-Palomar Airport

	Available	1993	1995	2000	2005	2010	2015
Total Tiedowns	240	297	306	319	332	342	354
Local	136	189	191	199	207	210	215
Transient	104[1]	108	115	120	125	132	139
Total Aircraft Apron (SY)	N/A	95,580	98,700	102,900	107,100	110,520	114,540

Note: [1] Approximately 60 aircraft are currently parked in non-designated tiedown areas

GENERAL AVIATION TERMINAL BUILDING

A general aviation terminal building has several functions which include providing space for passenger waiting, pilot's lounge and flight planning, concessions, management, storage, and various other needs. This space is not necessarily limited to a single, separate terminal building, but also includes the space offered by fixed base operators for these functions and services.

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 4D, General Aviation Terminal Building Requirements**, outlines the space requirements for a general aviation terminal building facility at McClellan-Palomar Airport during the planning period. The available lobby and flight planning areas of the FBO facilities do not appear to provide adequate area to meet the general aviation terminal needs throughout the planning period.

TABLE 4D
General Aviation Terminal Building Requirements
McClellan-Palomar Airport

	Available	1993	1995	2000	2005	2010	2015
Design Hour Pilots and Passengers	N/A	150	161	168	176	184	194
Terminal Building (SF)	10,000[1]	11,300	12,100	12,600	13,200	13,800	14,600

Notes: N/A - Not Applicable
[1] includes FBO's lobby and flight planning facilities

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 requirements for tenants and visitor parking at a general aviation terminal at McClellan-Palomar Airport were based upon the number of design hour pilots and passengers. The total number of public parking positions was projected based on one space per design hour pilot and passenger and 350 square feet per automobile parking space (providing both the parking stall and a share of the parking aisles).

General aviation parking requirements were calculated under the assumption that 25 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 4E, Public Vehicle Parking Requirements**, reflects parking facilities that are currently available and those that will be required in the future.

General aviation facility requirements are summarized in **Exhibit 4B, General Aviation Facility Requirements**, at the end of the chapter.

TABLE 4E
Public Vehicle Parking Requirements
McClellan-Palomar Airport

	Available	1993	1995	2000	2005	2010	2015
Pilots and Design Hour Passengers	N/A	150	161	168	176	184	194
Terminal Vehicle Spaces	N/A	150	161	168	176	184	194
Parking Area (SY)	N/A	5,800	6,300	6,500	6,800	7,200	7,500
General Aviation Spaces	N/A	124	125	134	143	148	156
Parking Area (SY)	N/A	4,800	4,900	5,200	5,600	5,800	6,100
Total Parking Spaces	99[1]	274	286	302	319	332	350
Total Parking Area (SY)	N/A	10,600	11,200	11,700	12,400	13,000	13,600

Notes: N/A - Not Applicable
[1] Total number of parking space in the existing terminal area

AIRLINE TERMINAL REQUIREMENTS

Components of the terminal area complex include the terminal building, gate positions and apron area. The following discussion outlines the facilities required to meet the terminal needs at McClellan-Palomar Airport throughout the planning period.

The analysis of facility requirements for various terminal complex functional areas at the McClellan-Palomar Airport was performed within the guidelines of *FAA AC 150/5360-9, Planning and Design of Airport Terminal Facilities at Nonhub Locations*. This document was used along with results of inventory, forecast, and demand/capacity to prepare estimates of various terminal building requirements.

Facility requirements were developed for the planning period based upon enplanement levels projected for the 20-year planning period. It should be noted that actual construction of any of the facility requirements should be related to the enplanement levels rather than the forecast year.

AIRLINE TERMINAL BUILDING

The size of the terminal building will depend upon the type of airline operations it must accommodate as well as the peak activity periods that can regularly be expected. As discussed in the Forecast Chapter, commercial airline service is expected to not only continue, but expand throughout the planning period.

Utilizing the criteria established in the aforementioned FAA Advisory Circulars, the gross size of the commercial service terminal building was estimated. **Table 4F, Commercial Service Terminal Building Requirements**, depicts the recommended gross size of the terminal building based upon the forecast enplanement levels. According to the table, the current commercial service trailer buildings and terminal building are less than the size recommended for the current usage. A larger airline terminal building is, therefore, recommended over the short-term. Due to the projected enplanement levels, the design of this facility should allow for its continued expansion to approximately 6,900 square feet.

TABLE 4F
Commercial Service Terminal Building Requirements
McClellan-Palomar Airport

	Available	1993	1995	2000	2005	2010	2015
Annual Enplanements	N/A	14,455	19,000	33,000	45,000	55,000	65,000
Design Hour Enplanements	N/A	7	10	17	23	27	33
Peak Hour Passengers	N/A	18	25	43	58	68	83
Terminal Building Elements							
Public Waiting Area	N/A	1,700	1,800	1,900	2,000	2,100	2,200
Airline Ticketing/Operations	N/A	700	900	1,100	1,200	1,400	1,500
Ticket Lobby	N/A	100	120	150	200	240	260
Ticket Counter (LF)	N/A	5	7	9	11	13	15
Baggage Claim Area	N/A	500	530	550	600	650	700
Baggage Claim Counter (LF)	N/A	18	20	22	23	24	25
Food, Beverage and Terminal Services[1]	N/A	1,500	1,650	1,750	1,800	1,960	2,040
Airport Management	N/A	900	1,100	1,250	1,400	1,550	1,700
Total Area (SF)	**4,100[2]**	**5,400**	**6,100**	**6,700**	**7,200**	**7,900**	**8,500**

Notes: N/A - Not Applicable
[1] Terminal Services includes area for rental cars, retail shops, vending machines, restrooms, security, concessions, and maintenance and storage.
[2] Includes the existing terminal building and both airline trailer buildings.

Source: *FAA Advisory Circular 150/5360-9*, Planning and Design of Airport Terminal Facilities at Nonhub Locations.

Public Waiting Area

The public waiting area is the designated waiting area for passengers immediately prior to boarding an aircraft. This area includes the lobby, circulation, security screening, and departure areas. The public area requirements are generally based on design hour activity, gate requirements and fleet mix projections. The McClellan-Palomar Airport currently has a small departure lounges within the trailer facilities, separated from the lobby and ticketing area.

Table 4F depicts the lobby waiting area requirements for the commercial airlines. The lobby waiting area at McClellan-Palomar Airport should be approximately 2,800 square feet by the end of the planning period.

Airline Support Areas

Airline ticket counter, length, counter area, airline ticket office, ticketing lobby, and baggage handling area requirements were calculated in accordance with *FAA Advisory Circular 150/5360-9*. These requirements

were based upon peak hour activity. **Table 4F** outlines the airline ticketing/operations requirements for the McClellan-Palomar Airport over the twenty year planning period. Approximately 1,500 square feet will be needed by the end of the planning period. Total requirements are nearly double the current capacity, including the temporary trailers.

Baggage Claim Facilities

Baggage claim facility requirements are depicted in **Table 4F**. These were based upon the anticipated peak hour activity at McClellan-Palomar Airport during the planning period.

Currently, the airport has a baggage claim counter located outside of the existing terminal building. It is estimated that approximately 700 square feet of baggage claim area will be needed by the end of the planning period. A baggage claim counter of 25 feet is also anticipated to be needed by the year 2015.

Food, Beverage, and Terminal Services

Food, Beverage, and Terminal Services include passenger and visitor-oriented amenities, concessions and services other than those provided by the airlines. For planning purposes this area includes rental car companies, retail shops, vending machines, restrooms, security, concessions, and maintenance and storage operations. It is expected that approximately 2,000 square feet will be needed by the end of the planning period. **Table 4F** outlines the terminal services facility requirements throughout the planning period.

AIRLINE GATE POSITIONS AND APRON AREA

At the present time there is one gate position at the McClellan-Palomar Airport. Currently, this gate is not assigned to a particular airline. The two existing airlines share this gate for loading and unloading of passengers. As enplanements increase during the planning period, additional gates will be required. **Table 4G, Airline Gate and Apron Area Requirements**, depicts the number of gates anticipated throughout the planning period.

TABLE 4G
Airline Gate and Apron Area Requirements
McClellan-Palomar Airport

	Available	1993	1995	2000	2005	2010	2015
Peak Hour Passengers	N/A	18	25	43	58	68	83
Commuter Aircraft Gate Positions (aircraft with 19 seats or less)	1	2	1	1	1	1	1
Apron Area (SY)	N/A	4,000	2,000	2,000	2,000	2,000	2,000
Regional Aircraft Gate Positions (aircraft with 30-70 seats)	N/A	0	1	1	1	2	2
Apron Area (SY)	N/A	0	4,000	4,000	4,000	8,000	8,000
Total Gate Positions	1	2	2	2	2	3	3
Total Apron Area (SY)	N/A	4,000	6,000	6,000	6,000	10,000	10,000

Note: N/A - Not Applicable

The size and configuration of the airline apron will vary with the level of airline service. A commuter airline generally can be expected to operate smaller aircraft with less than 30 passenger seats, however, the larger regional aircraft can seat nearly 70 passengers. According to the table, the existing apron area at the McClellan-Palomar Airport will not be adequate to meet the demand through the planning period. Consideration should, therefore, be given to providing additional apron area as the demand warrants.

Airlines serving McClellan-Palomar Airport primarily serve origin-destination traffic with minimum numbers of connecting passengers; therefore, a linear concept gate area with a minimum distance from curb to gate would work best. In this configuration, the aircraft would pull up to the face of the terminal building to load and unload passengers. The aircraft could then be pushed back from the gate for departure.

AUTOMOBILE PARKING

Vehicle parking in the terminal area includes those spaces utilized by passengers, visitors and employees. Parking spaces are classified as public, employee, and rental car. Requirements for public and rental car parking are dictated by origin-destination passenger levels and the availability of other modes of ground transportation. Employee parking is dependent upon total passenger levels.

The requirements for public vehicle parking was determines using *Advisory Circular 150/5360-9, Planning and Design of Airport Terminal Facilities at Nonhub Locations.* Approximately 145 public parking spaces are needed by the end of the planning period. Employee parking was determined to be 10 percent of the spaces needed for public parking and rental car requirements were determined to be 25 percent of public parking. Each parking space will

require approximately 350 square feet of area for parking and maneuvering. **Table 4H, Airline Terminal Automobile Parking Requirements**, depicts the results of this analysis. According to the table, additional parking at McClellan-Palomar Airport should be considered over the long-term.

TABLE 4H
Airline Terminal Automobile Parking Requirements
McClellan-Palomar Airport

	Available	1993	1995	2000	2005	2010	2015
Annual Enplanements	N/A	14,455	19,000	33,000	45,000	55,000	65,000
Public Parking Spaces	99	45	55	75	110	125	145
Employee Parking Spaces	5	5	6	8	11	13	15
Rental Car Parking Spaces	12	13	14	21	30	35	37
Total Parking Spaces	116	63	75	104	151	173	197
Parking Area (SY)	4,500	2,500	3,000	4,100	5,900	6,800	7,700

Note: N/A - Not Applicable

If paid parking is established, the public lot is typically subdivided into short and long term parking areas. The short term parking lot is located most conveniently to the terminal building and parking rates are higher than in the long term lot. Approximately 20 percent of all public parking should be designated as short term parking.

The commercial aviation facility requirements that should be developed during the planning period are illustrated at the end of this chapter in **Exhibit 4C, Commercial Service Facility Requirements.**

AIRPORT ACCESS

Access to the McClellan-Palomar Airport is currently available off of both Palomar Airport Road and El Camino Real. Both of these access roads would appear to be capable of accommodating the anticipated vehicular activity to and from McClellan-Palomar Airport. The on-airport access roadways, however, are in fair condition and would require additional roadway development. The locations for additional on-airport access will be examined in the following chapter.

SUPPORT FACILITIES

Various facilities that do not logically fall within classifications of airfield, terminal building or general aviation requirements have been identified as support facilities. The following paragraphs describe the Airport Rescue and Firefighting (ARFF), Fuel Storage, and Airport Maintenance facility requirements.

AIRPORT RESCUE AND FIREFIGHTING

Requirements for Airport Rescue and Firefighting (ARFF) services at an airport are established under *Federal Aviation Regulation (F.A.R.) Part 139*. F.A.R. Part 139.49 establishes an ARFF index determination.

If commercial aircraft serving McClellan-Palomar Airport in the future are capable of passenger capacities in excess of 30 passengers, a ARFF facility will be required. The ARFF would have a ARFF rating of Index A. This index rating is based on the number of departures conducted by aircraft within a specific length category. The longest length air carrier aircraft with an average of at least five daily departures determines the required Index group for the airport. The equipment and fire fighting capability of the Index A category meets requirements for commercial airline aircraft with lengths less than 90 feet. Index A requires at least one vehicle carrying at least 500 pounds of sodium-based dry chemical or halon 1211, or 450 pounds of potassium based dry chemical and water with an equal quantity of foaming agent to total 100 gallon, for simultaneous application.

As stated in the previous chapter, Board Policy F-44 currently limits the commuter aircraft to 30 seats or less. Should the 30-seat limit be eliminated at its sunset date on December 31, 1995, ARFF facilities may be considered as an option to current F.A.R. Part 139 operating standards.

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 significantly. The location of the fuel storage area depends upon the airport's operational activity and management procedures. A remote location of the fuel storage facility will require the use of a service vehicle to make the fuel available to the aircraft on the apron area.

Future fuel storage requirements for McClellan-Palomar Airport were projected following an analysis of the historical fuel use characteristics at the airport for the past year, both for Jet A fuel and AvGas. The average rate of fuel consumption for this period was 8.0 gallons per operation. This ratio can be expected to increase as the size of the aircraft fleet increases.

Table 4J, Fuel Storage Requirements, provides a forecast of the bi-monthly fuel storage capacity that will be required at McClellan-Palomar Airport. Storage requirements are based on a two-week on-hand supply; however, more frequent deliveries can reduce the fuel storage capacity requirement. As indicated in **Table 4J**, the current fuel storage capacity of 92,500 gallons is not adequate to meet the bi-monthly fuel storage requirements for the 20-year planning period. It is recommended that additional storage tanks be installed for both 100LL and Jet A fuel, when the demand to maintain more of each of these fuels exists. Once again, more frequent fuel deliveries (weekly) would reduce the amount of fuel storage capacity required.

TABLE 4J
Fuel Storage Requirements
McClellan-Palomar Airport

	Available	1993	1995	2000	2005	2010	2015
Annual Operations	N/A	217,739	231,800	247,117	261,639	276,216	289,515
Peak Month Operations	N/A	20,128	21,542	23,027	24,417	25,789	27,016
Average Fuel Ratio	N/A	8.0	8.1	8.2	8.3	8.4	8.5
Bi-monthly Fuel Storage Requirements (Gallons)	92,500[1]	80,100	87,300	94,500	101,300	108,400	114,900

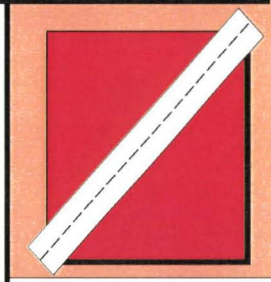
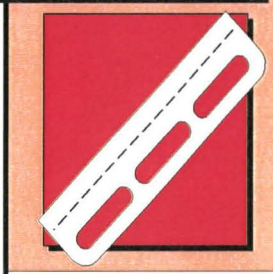
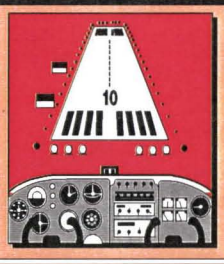
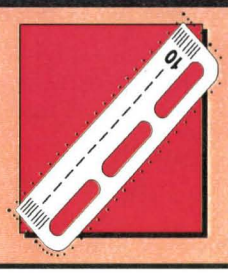
Notes: N/A - Not Applicable
[1] Total fuel storage capacity

CONCLUSIONS

Few of the facilities at the McClellan-Palomar Airport will be capable of meeting the unconstrained forecast demand through the planning period. Many will need to be improved or expanded in order to adequately service the anticipated increase in both aircraft operations and passengers utilizing the facility. **Exhibits 4A, Airside Facility Requirements, 4B, General Aviation Facility Requirements,** and **4C, Commercial Service Facility Requirements** provide a summary of the facility requirements determinations.

The next step in the master planning process is to analyze development alternatives that can accommodate these requirements. The next chapter will provide this analysis and recommend the best alternative for the future development of the McClellan-Palomar Airport. A recommended development alternative will be identified that will accommodate as much of the unconstrained forecast as possible, under the physical and policy constraints of the Airport. Based on the evaluation of both physical and policy constraints as well as airport expansion potential, "constrained" forecasts will be developed.

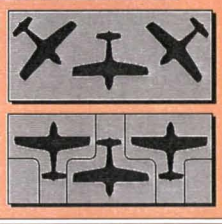
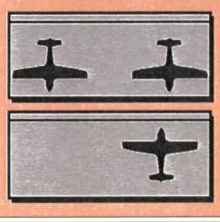
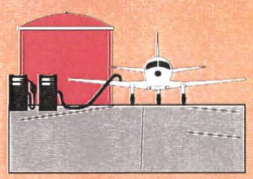
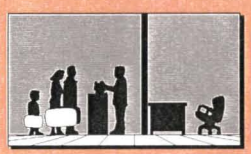
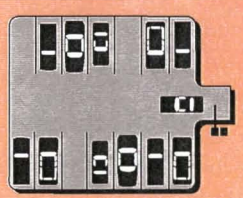
93MP12-4A-6/24/94

	EXISTING	2000	2005	2015
RUNWAYS 	Runway 6-24 4700' x 150' 30,000 lbs SWL 80,000 lbs DWL 110,000 lbs DTWL	Runway 6-24 TO BE DETERMINED	Runway 6-24 SAME	Runway 6-24 SAME
TAXIWAYS 	Runway 6-24 Full Parallel Connecting High Speed	Runway 6-24 TO BE DETERMINED	Runway 6-24 SAME	Runway 6-24 SAME
NAVIGATIONAL AIDS 	Beacon, ATCT Runway 6-24 ILS VOR VASI REIL	Beacon, ATCT Runway 6-24 ILS/GPS VOR PAPI REILS	Beacon, ATCT Runway 6-24 SAME	Beacon, ATCT Runway 6-24 SAME
LIGHTING and MARKING 	Runway 6-24 HIRL Visual/Precision MALSR Taxiways MITL Centerline	Runway 6-24 HIRL Non Precision / Precision MALSR Taxiways SAME	Runway 6-24 SAME Taxiways SAME	Runway 6-24 SAME Taxiways SAME

McCLELLAN-PALOMAR AIRPORT

Exhibit 4A
AIRSIDE FACILITY REQUIREMENTS

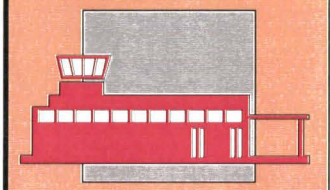
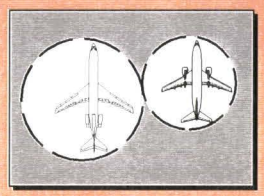
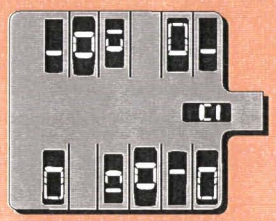
93MP12-4B-6/20/95

	EXISTING	2000	2005	2015
HANGARS				
				
T-Hangars	110	156	164	171
Conventional Hangar (S.F.)	150,000	333,400	374,400	432,100
APRON TIE-DOWNS				
				
Local Ramp Positions	136	199	207	215
Transient Ramp Positions	104	120	125	139
Total Apron Area (S.Y.)	N/A	102,900	107,100	114,540
FUEL STORAGE				
				
Bi-Monthly Fuel Storage Requirements (Gallons)	92,500*	94,500	101,300	114,900
*Existing capacity				
GENERAL AVIATION TERMINAL				
				
Total Terminal Area (S.F.)	10,000*	12,600	13,200	14,600
*Existing FBO area				
AUTO PARKING				
				
Total Parking Positions	99*	302	319	350
Terminal	99	168	176	194
General Aviation	N/A	134	143	156
Total Area (S.Y.)	N/A	11,700	12,400	13,600
*Existing terminal parking				

McCLELLAN-PALOMAR AIRPORT

Exhibit 4B
GENERAL AVIATION
FACILITY REQUIREMENTS

93MP12-4C-6/24/94

	EXISTING	2000	2005	2015
TERMINAL BUILDING 	Total Area (S.F.) 4,100* *Includes existing terminal & trailers	6,700	7.200	8,500
TERMINAL GATE POSITIONS 	Commuter Aircraft Gates 1	1	1	1
	Regional Aircraft Gates 0	1	1	2
AUTO PARKING 	Parking Spaces 116	104	151	197
	Parking Area (S.Y.) 4,500	4,100	5,900	7,700

McCLELLAN-PALOMAR AIRPORT

Exhibit 4C
COMMERCIAL SERVICE REQUIREMENTS

Chapter Five

DEVELOPMENT ALTERNATIVES

McCLELLAN-PALOMAR
A·I·R·P·O·R·T

Chapter Five

McCLELLAN-PALOMAR AIRPORT

DEVELOPMENT ALTERNATIVES

In the previous chapter, "unconstrained" facility needs for the twenty-year planning period were identified. The next step in the planning process is to examine the options available within the existing resources of the McClellan-Palomar Airport and determine the airside and landside alternatives that will maximize use of these resources. Once the airside and landside alternatives have been selected, the level of aviation activity that can be accommodated can be approximated.

AIRPORT DEVELOPMENT ISSUES

As identified in Chapter Two, Aviation Demand Forecasts, a number of policies exist that limit or restrict the development at McClellan-Palomar Airport (i.e., F-44, Ordinance 21.53.015, and Noise Policy #17). It is necessary, however, to continue to examine the airport's ability to accommodate as much of the "unconstrained" forecast as possible. With these limitations in mind, both airside and landside alternatives will be developed. Based on the recommendations determined during this analysis, "constrained" forecast can be approximated.

CONCEPTUAL DEVELOPMENT ALTERNATIVES

The overall purpose of this chapter is to evaluate both airside and landside alternatives based on environmental, economic, and aeronautical factors to determine which alternatives best accommodate as much of the local aviation demand as possible. Three conceptual alternatives are described in detail in the following sections, including a no-build alternative, relocating demand to other airports and developing the existing airport site.

NO-BUILD ALTERNATIVE

In analyzing and comparing the costs and benefits of various development alternatives, it is important to keep in mind the consequences of no future development at McClellan-Palomar Airport. The "no-build" alternative essentially involves maintaining the airport in its present condition and not providing for improvements to the existing facilities. The primary result of this alternative would be the inability of the airport and the system to accommodate the demands being placed upon it by its users in the future.

The facility requirements chapter identified the need for additional landside facilities (i.e., terminal space, T-hangars, tiedowns, automobile parking, etc.). Without these facilities the users of the airport will be constrained from taking maximum advantage of their air transportation capabilities. This would be contrary to the policies of the County to provide air transportation facilities to the residents of North San Diego County. Just as important will be the County's ability to attract or serve new users, especially potential businesses and industries relocating to the area.

With these restrictions in mind, it would appear that the "no-build" alternative would not be in the best interest of the airport or the economy of the surrounding communities.

TRANSFER SERVICE TO OTHER AIRPORTS

This alternative addresses the potential for shifting forecast aviation demand to other airports. The ability of other airports in the North County area to accommodate the McClellan-Palomar Airport forecast aviation activity is difficult to predict without an in-depth airport system analysis. It is assumed that, by virtue of the policy and physical constraints at McClellan-Palomar Airport, other area airports may need to accommodate that portion of aviation demand that can not be accommodated at McClellan-Palomar Airport. The capabilities of McClellan-Palomar Airport will be determined following the alternatives evaluation.

It appears, from a cursory review of airport capacity in North County, that additional operations can be accommodated with the facilities presently available. The airports most likely to accommodate this "overflow" aviation activity from McClellan-Palomar Airport is Oceanside Municipal Airport, Ramona Airport, Montgomery Field, and Fallbrook Airport. Some of these airports would require additional facilities in order to accommodate this activity, however, the determination of the facilities needed is beyond the scope of this master plan study.

DEVELOP EXISTING AIRPORT SITE

As previously discussed, limitations imposed by policy constraints and the physical size of the airport's property preclude full development of McClellan-Palomar Airport to meet the "unconstrained" forecast facility needs. Undeveloped property on or adjacent to the airport and redevelopable portions of the existing airport property will only accommodate a portion of this demand. The amount and type of development that can be accommodated is the subject of further analysis in this chapter.

Without sufficient land to meet the forecast requirements, it would be necessary to prioritize the facility requirements and set parameters for future expansion before analyzing development alternatives. The

following criteria were developed after a thorough analysis of the facility's deficiencies, "unconstrained" forecast demands and existing policies.

- **Runway Length:** It is not feasible at this time to lengthen the existing runway. Although additional runway length (to 6,000 feet) would enhance safety and capacity, physical, practical and economic limitations eliminate this option within the "unconstrained/ constrained" analysis.

- **Parallel Runway:** Likewise, although a parallel runway would enhance safety and capacity, the same physical, practical and economic consideration eliminate this option from analysis at this time.

- **Land Acquisition:** Land acquisition, particularly Lots 36, 23, 24, 25, 42 and 50 of the Palomar Airport Centre business park will be key to the future success of the airport, as well as provide protection from encroachment into navigable airspace and Flight Activity Zones, as defined in the CLUP for the airport.

- **Conventional Hangar and T-hangar Development:** There is an existing need to resolve, to the extent possible, the landfill problems associated with the "port-a-port" hangar area. In addition, the existing T-hangar area should be redeveloped to make the best use of the available area.

- **Commercial Service Terminal Building:** The existing terminal building, along with the two portable trailers, do not satisfy the current or long-term facility demands. The ability to accommodate all commercial service activity in one building should be examined.

- **Improve Ground Access:** The existing airport access road is located along the southern edge of the airport property and passes through a landfill site. Extreme subsidence has occurred in the area causing the road to sink in various locations. The ability to provide additional or other access points should be examined.

AIRSIDE CONCEPTS

Airside facilities are generally the first consideration in developing airport alternatives because of their primary role in supporting and directing aircraft movements. Airside development also typically dominates airport land use; therefore, selection of an airside concept will usually affect the amount and location of other types of land uses.

Runways and taxiways must be designed to safely and efficiently assist the flow of aircraft to and from the landside facilities. The primary considerations in airside development are the runway orientation, operational capacity and runway length.

Earlier, in Chapter Four, it was determined that the existing runway orientation meets the FAA standards; therefore, no crosswind runway will be examined. It was also determined that additional capacity is needed to meet the "unconstrained" forecast demand. The most efficient means of acquiring additional capacity is to provide a parallel runway. Due to the physical constraints at McClellan-Palomar Airport, it is not economical or practical to construct a parallel runway. Additional taxiway exits, however, can be added at key locations to maximize the airfield capacity.

Runway length was also examined at McClellan-Palomar Airport in an effort to enhance aircraft safety level during both arrival and departure. Currently, Runway 6-24 is 4,700 feet in length and would appear that physical, practical and economic constraints would eliminate the possibility to accommodate a 6,000 foot runway length. There is, however, the ability to enhance operational safety with the use of a displaced threshold. This concept is discussed in the following section.

DISPLACED THRESHOLD

A displaced threshold at the approach end of Runway 24 is recommended to provide an additional margin of safety for departures from Runway 24. A benefit of the displaced threshold will be a slight reduction in noise impact to the West, while concentrating the corresponding increase on airport property to the East. A discussion and an illustration of noise contours are presented later in this chapter.

Two alternatives were evaluated for practical and economic feasibility. Both a 300 foot and a 500 foot displaced threshold were examined. A 500 foot displaced threshold will require structural design for the portion extending into Landfill No. 3, while another option would be to excavate the area and prepare an engineered fill area in its place. Cost estimates for this option are shown in the following section.

The 300 foot displaced threshold requires construction up to the edge of Landfill No. 3 and only minor structural support would be required to accommodate the displaced threshold. While the parallel taxiway would also require the displacement of the landfill, the additional taxiway would not increase the airfield capacity. Additional taxiway exits will slightly increase the overall airfield capacity. These taxiway exits should be situated at points providing the maximum airfield capacity as possible. They can be acute-angled exits or high-speed exits, thereby, allowing aircraft to exit the runway more quickly and decreasing the time the aircraft is on the runway.

LAND ACQUISITION

Currently, some land within the existing RPZ for Runway 24 is not owned or controlled by the County. It is recommended that this land be acquired to prevent any encroachment on navigable airspace. In addition, land within the proposed nonprecision RPZ for Runway 6 will also need to be acquired.

AIRSIDE DEVELOPMENT COST COMPARISON

Table 5A, Airside Development Cost Comparison, compares "order of magnitude" development costs for providing a 500 foot or 300 foot displaced threshold. These reflect general cost estimates for site preparation and airside development and should be used for comparison purposes only. As shown in **Table 5A,** the cost of the two concepts range from $6.8 million to $9.7 million. The major difference between the two concepts is that, because of the landfill, there would be more earthwork with the 500 foot displaced threshold.

TABLE 5A
Airside Development Cost Comparison
McClellan-Palomar Airport

	Displaced Threshold of	
Development Item	500 feet	300 feet
Land Acquisition	$3,600,000	$3,600,000
Earthwork/Drainage	3,000,000	1,000,000
Displaced Threshold	375,000	225,000
Taxiway Extension	375,000	225,000
Taxiway Construction	225,000	225,000
Extend Runway Lighting	35,000	21,000
Extend Taxiway Lighting	42,000	26,000
Install Taxiway Lighting	42,000	42,000
Install PAPIs	60,000	60,000
Relocate REILs	5,000	5,000
Runway/Taxiway Markings	30,000	25,000
Airside Subtotal	**$7,789,000**	**$5,454,000**
Engineering & Contingencies	1,947,500	1,363,500
TOTAL AIRSIDE COSTS	**$9,736,500**	**$6,817,500**

AIRSIDE DEVELOPMENT RECOMMENDATIONS

It is recommended that a **300 foot** displaced threshold be constructed to the east end of the existing runway. By reducing the displaced threshold from 500 feet to 300 feet, significant cost and environmental impacts resulting from disturbance of the landfill can be minimized. The layout of the recommended airside development is illustrated on **Exhibit 5A, Recommended Airside Alternative.**

The 300 foot displaced threshold will allow aircraft departing McClellan-Palomar Airport to utilize the 300 foot displaced threshold, while arriving aircraft would continue to operate to the existing runway end. This would result in no changes to the arrival profiles of the aircraft operating to Runway 24. By providing the 300 foot displaced threshold, departing aircraft could achieve a higher altitude prior to leaving airport property, potentially reducing the noise impact.

By displacing the runway threshold, the FAA utilizes "declared distances" to evaluate and define the usable runway length. Declared distances are simply defined as the amount of runway that is declared available for certain takeoff and landing operations. Specifically, declared distances incorporate the following concepts:

- **Takeoff Run Available (TORA)** - The runway length declared available and

suitable for the ground run of an aircraft taking off;

- **Takeoff Distance Available (TODA)** - The TORA plus the length of any remaining runway and/or clearway beyond the far end of the TORA;

- **Accelerate-Stop Distance Available (ASDA)** - The runway plus stopway length declared available for the acceleration and deceleration of an aircraft aborting a takeoff; and

- **Landing Distance Available (LDA)** - The runway length declared available and suitable for landing.

Table 5B, Declared Distances, presents the appropriate distances available under the existing condition and with the 300 foot displaced threshold to the east at McClellan-Palomar Airport.

TABLE 5B
Declared Distances
McClellan-Palomar Airport

Runway	TORA	TODA	ASDA	LDA
Existing Runway Configuration				
Runway 6	4,700 ft	4,700 ft	4,700 ft	4,700 ft
Runway 24	4,700 ft	4,700 ft	4,000 ft	4,000 ft
With 300 foot Displaced Threshold				
Runway 6	5,000 ft	5,000 ft	5,000 ft	5,000 ft
Runway 24	5,000 ft	5,000 ft	4,300 ft	4,000 ft

Source: AC 150/5300-13, Airport Design

As shown in **Table 5B**, all distances associated with Runway 6 are increased by 300 feet. The TORA, TODA and ASDA for Runway 24 are also increased by 300 feet, however, the LDA remained the same. As previously stated, the aircraft arrival profiles for Runway 24 will not change, however, departures on Runway 24 will have the ability to gain additional altitude prior to leaving airport property.

NOISE CONTOUR COMPARISON

Aircraft sound emissions are often the most noticeable environmental effect an airport will produce on the surrounding community; therefore, the noise impacts associated with the proposed airside development at McClellan-Palomar Airport were evaluated. In California, the basic methodology employed to determine noise exposure from airports and aircraft is the Community Noise Equivalency Level (CNEL). CNEL is based on the Yearly Day-Night Average Sound Level (DNL) metric which is currently accepted by the FAA, Environmental Protection Agency (EPA), and the Department of Housing and Urban Development (HUD) as an appropriate measure of cumulative noise exposure. The 65 CNEL is accepted as the threshold of

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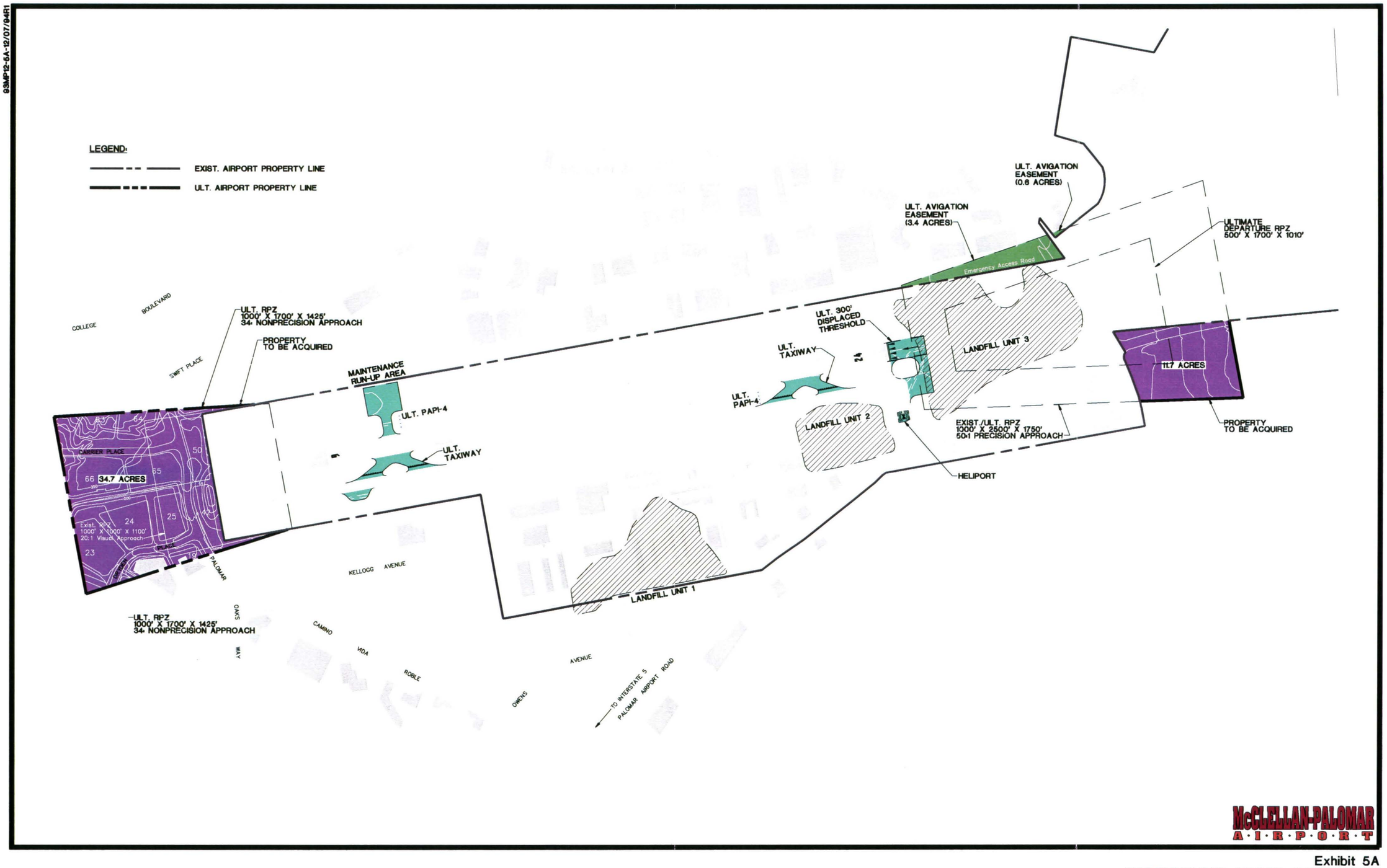

McCLELLAN-PALOMAR AIRPORT

Exhibit 5A
RECOMMENDED AIRSIDE ALTERNATIVE

incompatibility by both the FAA and the State of California, meaning levels below 65 CNEL are considered compatible with all underlying land uses.

CNEL is defined as the average A-weighted sound level as measured in decibels (dBs), during a 24-hour period; a 5 dB penalty is applied to noise events occurring during the evening (7:00 p.m. to 10:00 p.m.) and a 10 dB penalty is applied to those events occurring at night (10:00 p.m. to 7:00 a.m.). CNEL is a summation metric which allows objective analysis and can describe noise exposure comprehensively over a large area.

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

The noise contours for McClellan-Palomar Airport were developed from the Integrated Noise Model (INM), Version 4.11. The INM was developed by the Transportation Systems Center of the U.S. Department of Transportation at Cambridge, Massachusetts, and has been specified by the FAA as one of two models acceptable for federally funded noise analysis. The previous F.A.R. Part 150 study for McClellan-Palomar Airport utilized an earlier version of the same computer model (INM Version 3.9).

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

Exhibit 5B, Noise Contour Comparison, illustrates two 60 CNEL noise contours, one based on the "unrestricted" 2015 operational forecast and the other on the "unrestricted" 2015 operational forecast with the 300 foot displaced threshold to the east. As shown in **Exhibit 5B**, the anticipated noise level in 2015 with the displaced threshold would slightly reduce some noise impact to the west. The noise impacts to the east would slight increase on airport property; however, they do not appear to effect any noise-sensitive off-airport land uses.

LANDSIDE DEVELOPMENT ALTERNATIVES

There are several landside functions to be accommodated at McClellan-Palomar Airport. General aviation, airlines and FBO leaseholds are the primary functional sectors at the present time. In addition, the ATCT, future ARFF, airport maintenance, fuel farms, rental cars, etc., are necessary support facilities.

The interrelationship of these functional areas is important to defining a long-range

landside layout for the airport. Landside facilities should be grouped with similar functions or uses. Each landside alternative must be planned with airfield as well as ground access that is suitable to its function. Runway frontage should be reserved for those uses with a high level of airfield interface. Other activities, with lower levels of aircraft movement, can be placed in more remote areas.

The location of the commercial service terminal at McClellan-Palomar Airport is a key issue in developing landside alternatives. For this reason, three landside alternatives have been developed that locate the commercial terminal facilities in three different locations.

Landfill gases, which are typical at sites adjacent to landfills, are a concern at McClellan-Palomar Airport. Landfill gases can build up to explosive levels in basements and lower levels of buildings, making them a concern to public health and safety. The County of San Diego Local Enforcement Agency (LEA) has detected explosive conditions in the basement of the building located at 2128 Palomar Airport Road and recommends that the building be demolished. Each of the following three landside alternatives provides for the demolition of this building, as well as other nearby structures. Any future use of this building is subject to review by the LEA prior to occupancy.

All future construction on the airport property and within 1,000 feet of any of these landfill units would need to be in compliance with the requirements of California Code of Regulations, Title 14, Division 7, Chapter 3, Article 7.8, Section 17796, or the regulations regarding postclosure land use that are in effect at the time such construction in undertaken.

LANDSIDE ALTERNATIVE A

Landside Alternative A, illustrated on **Exhibit 5C, Landside Alternative A**, redevelops the existing terminal area. This includes constructing a new facility that incorporates the functions of the existing terminal building and the two airline trailer facilities into one building. The existing site would be reconfigured to accommodate the ultimate terminal building, auto parking, ground access and rental car parking.

General aviation facilities such as tiedowns and hangars are also necessary to meet the forecast demand. Aircraft parking areas have been relocated and/or reconfigured to make the best use of available apron space. In order to minimize the continued problem with the landfill and port-a-port hangars, the port-a-ports could be relocated to an adjacent FBO area on the west side of the airport. If this area is unavailable for this use, another proposed hangar area could be utilized. The existing T-hangar area, located near midfield, would be redeveloped by removing the old hangars and constructing new structures perpendicular to the runway/taxiway system. The new T-hangars would be constructed in locations that would be minimally impacted by the landfill area. In addition, larger executive hangars have been shown in this redeveloped area. The existing Conventional Hangar #3 is shown relocated to the southeast, next to Conventional Hangar #1, in an area unaffected by the landfill.

Tiedowns for locally based aircraft would be located in the area south of the redeveloped T-hangar area. Aircraft tiedowns are preferred in the landfill area over T-hangars, due to the reduction of additional weight from the T-hangar structure. The existing transient tiedown areas would remain unchanged.

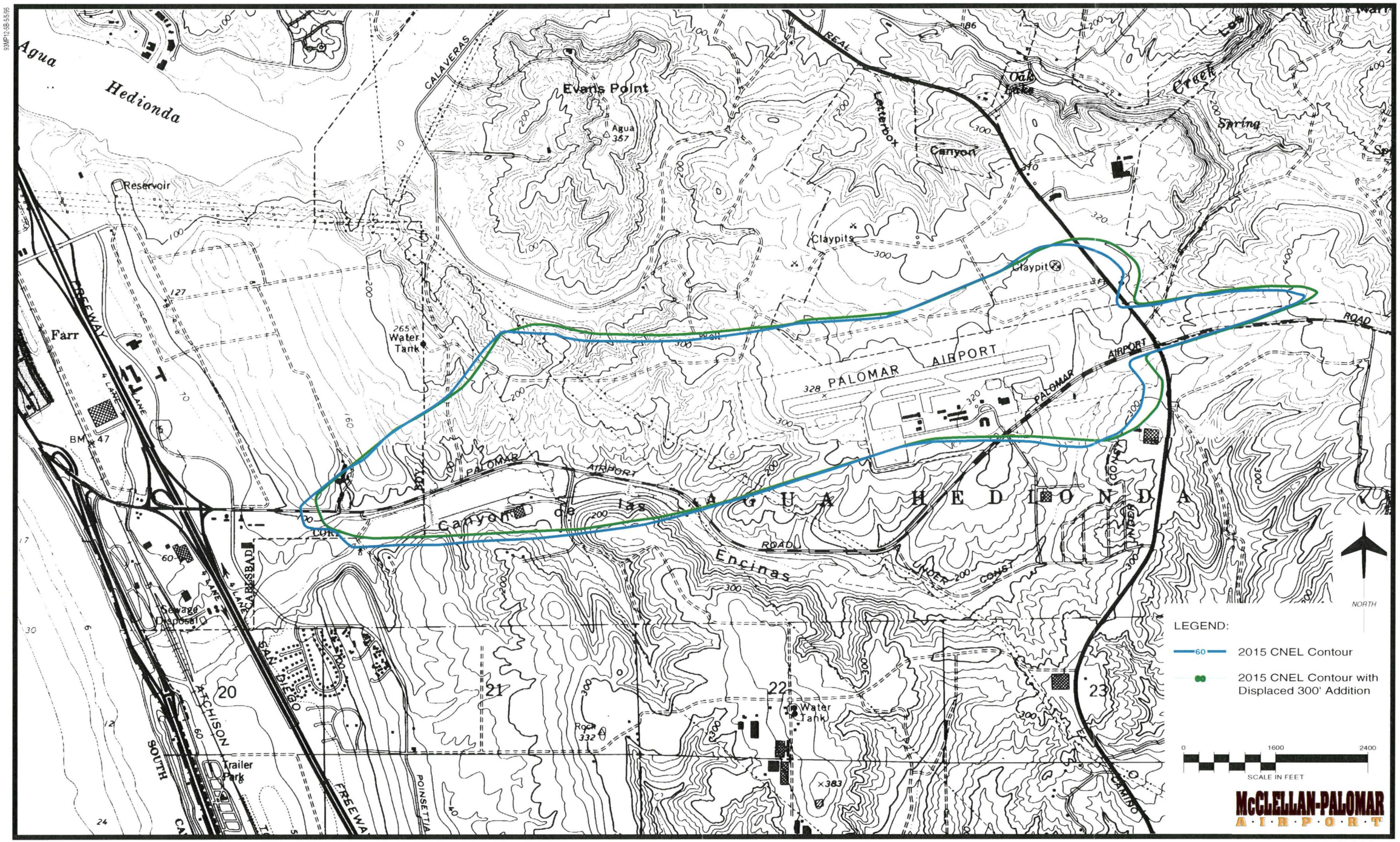

Exhibit 5B
NOISE CONTOUR COMPARISON

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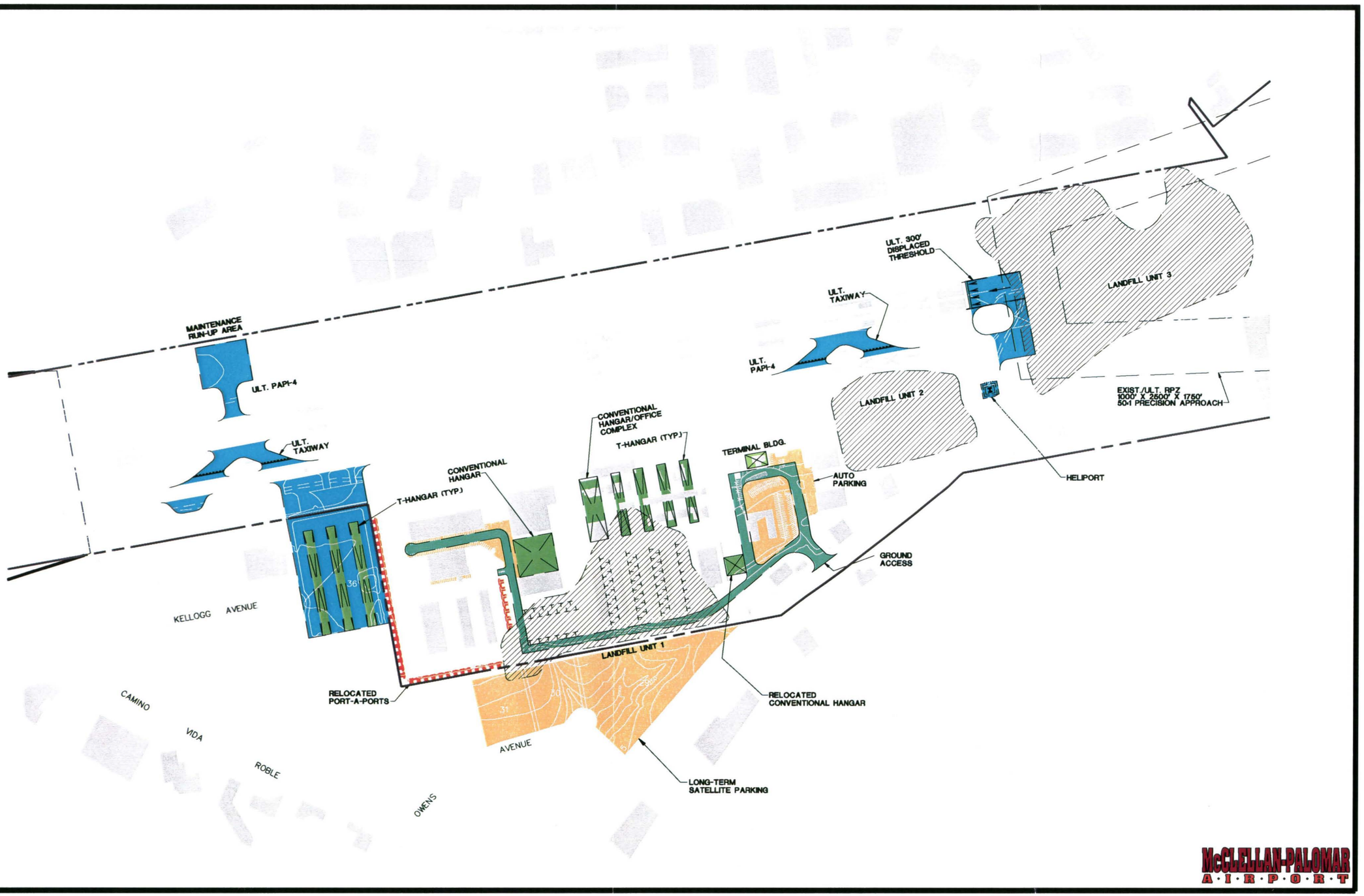

McCLELLAN-PALOMAR AIRPORT

Exhibit 5C
LANDSIDE ALTERNATIVE A

Lot 36, adjacent to the west side of the Airport, is shown to be acquired by the Airport for the development of an additional T-hangar area. Because the amount of developable apron area is limited due to the landfill, Lot 36 would provide an area to accommodate some of the additional hangar demand or the relocated port-a-ports. Access to this area would be via Palomar Airport Road to Camino Vida Roble to Kellogg Avenue.

Ground access to the existing facilities is another very important issue at McClellan-Palomar Airport. One of the primary concerns is the access road crossing the landfill area on the south side of the airport property. Because of various terrain constraints in the airport area, there is no one solution to this problem. In order to provide access to all existing facilities, it is necessary to maintain the existing access road. By limiting traffic on this access road with gated access, automobile traffic may be reduced or eliminated.

Additional auto parking is shown south of the existing access road within the Carlsbad Airport Centre Site Plan. Parcels 29, 30, and 31 are owned by the County and should be examined for transfer to the Airport for use as a satellite long-term parking area. Access to this area can be provide via the existing access road through a ramped access point to the parking area. This area could also be accessed via Owens Avenue.

LANDSIDE ALTERNATIVE B

The development of the commercial terminal facility is located in the existing T-hangar area under Landside Alternative B, shown in **Exhibit 5D, Landside Alternative B.** This alternative would develop the commercial terminal building between the Cinema Air FBO site and the existing terminal area. The new terminal building would be located so as not to be affected by the landfill; however, the associated auto parking area would be located in the landfill area.

The port-a-port hangars would again be relocated, as in Alternative A, to the FBO area on the west side of the property (or Lot 36). New T-hangar development would occur in the existing terminal area and Lot 36 would be utilizing for additional T-hangar development. Executive hangars are include as the last row of hangars in the existing terminal area. This alternative would leave Conventional Hangar #3 in its existing location.

Local aircraft tiedowns would be located south of the new terminal area, within the landfill area. Similar to Alternative A, the transient tiedowns would remain in the existing locations.

Ground access to the new terminal area can be accomplished via a relocation of the existing access road. The portion of the access road across the landfill would be removed to provide additional area for tiedowns. A separate access road could be constructed from the west, through Lot 36 assuming this is available, providing access to those businesses on the west side of the property.

Finally, additional long-term auto parking is shown south of the existing access road within Parcels 29, 30, and 31 similar to Alternative A. Access would be provided by a portion of the existing access road and Owens Avenue.

LANDSIDE ALTERNATIVE C

Unlike the two previous alternatives, Landside Alternative C, illustrated in **Exhibit 5E, Landside Alternative C**, acquires Lot 36 for the development of the new commercial service terminal. Since the terminal facilities would be located on Lot 36, the existing tiedown and hangar areas can be redeveloped utilizing the old terminal site for expansion. By locating the terminal facilities on Lot 36, a definable separation can be established between the commercial activities and the general aviation activities.

The port-a-port hangars would be relocated as in Alternative A and B. New T-hangars are shown parallel to the runway/taxiway system. These T-hangars are located as to minimize interaction with the landfill area. This alternative would leave Conventional Hangar #3 in its existing location.

Similar to the two previous alternatives, the local aircraft tiedowns are located in the landfill area and the transient area remains unchanged.

Ground access in this alternative is similar to that in Alternative A. The existing access road would provide access to the west side businesses through a gated access point. The new commercial service terminal area could be accessed via Palomar Airport Road to Camino Vida Roble to Kellogg Avenue.

Additional long-term auto parking is provided south of the existing access road within Parcels 29, 30, and 31. Access to this area can be provided via the existing access road and Owens Avenue.

LANDSIDE DEVELOPMENT COST COMPARISON

Table 5C, Landside Development Cost Comparison, compares "order of magnitude" development costs for the three landside development alternatives. These reflect general cost estimates for site preparation and landside development and should be used for comparison purposes only.

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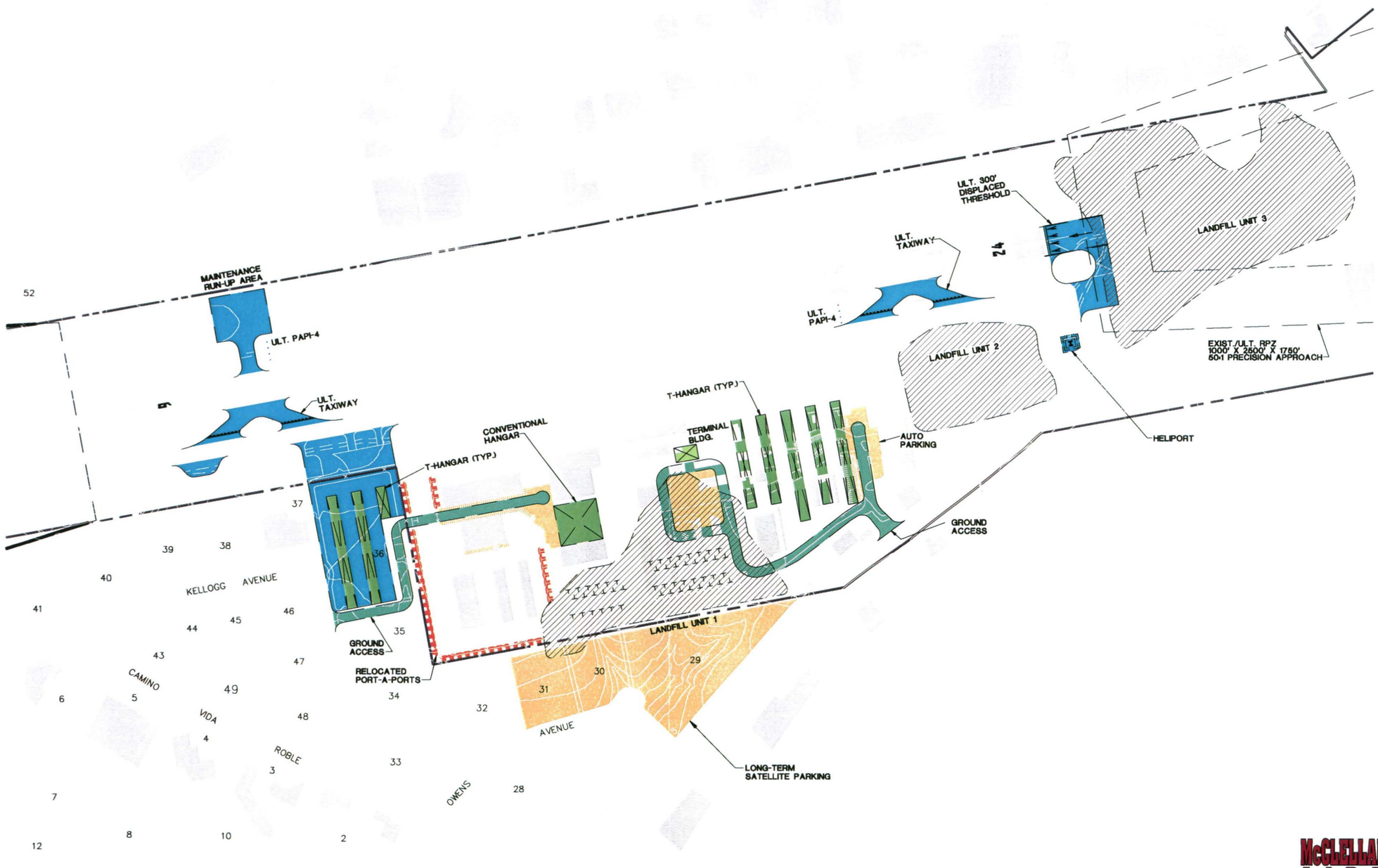

McCLELLAN-PALOMAR AIRPORT

Exhibit 5D
LANDSIDE ALTERNATIVE B

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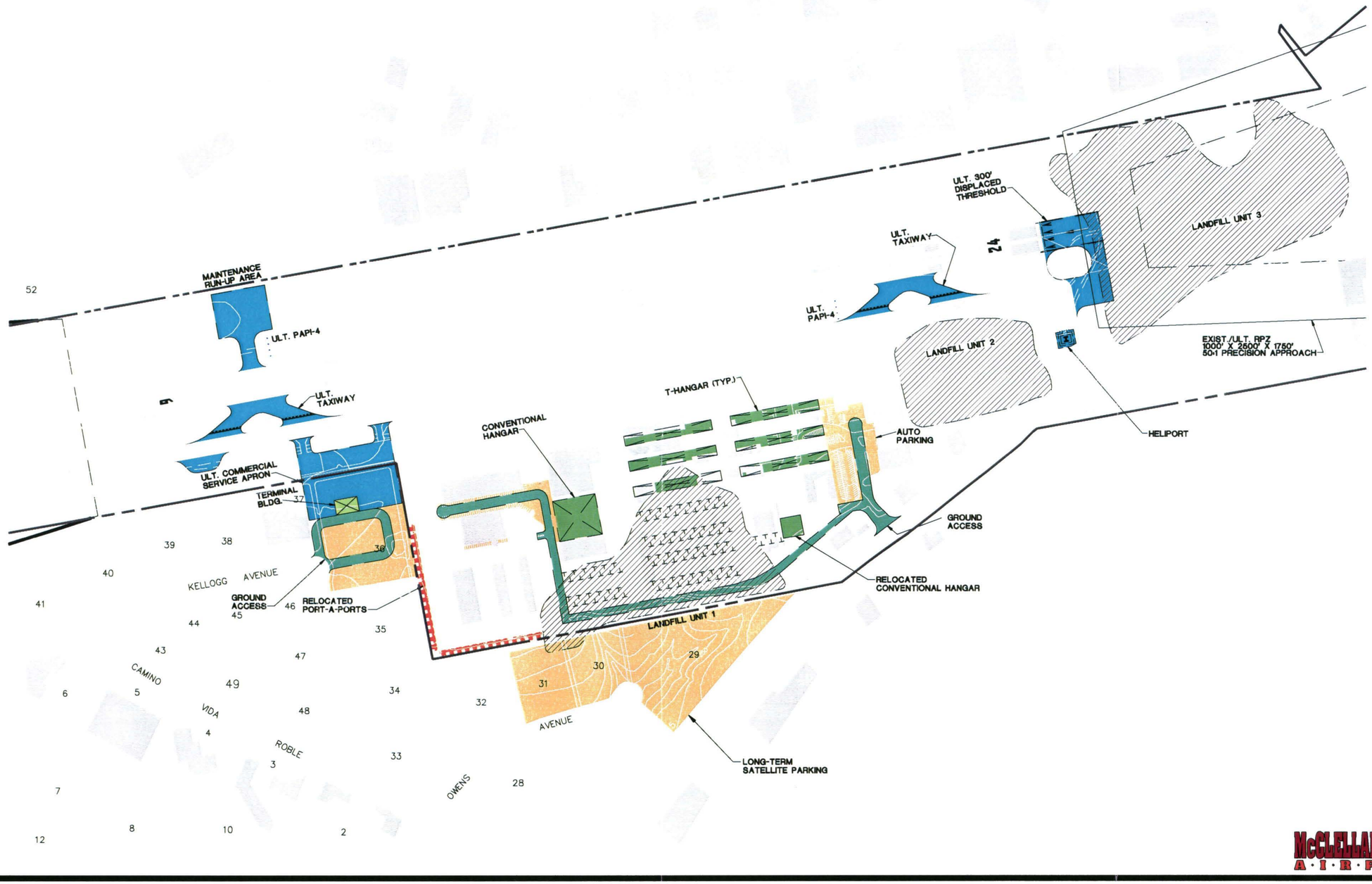


McCLELLAN-PALOMAR AIRPORT

Exhibit 5E
LANDSIDE ALTERNATIVE C

TABLE 5C
Landside Development Cost Comparison
McClellan-Palomar Airport

Development Item	Alternative A	Alternative B	Alternative C
Lot 36 Acquisition	$998,000	$998,000	$998,000
Earthwork/Drainage	1,000,000	1,500,000	1,000,000
Relocate Port-a-Port Hangars	360,000	360,000	360,000
Construct T-hangars	3,540,000	2,970,000	3,240,000
Construct Conventional Hangars	6,500,000	2,970,000	3,240,000
Install Tiedowns	27,000	25,000	48,000
Construct Auto Parking[1]	110,000	180,000	270,000
Construct Commercial Terminal Building	850,000	850,000	850,000
Construct Apron	850,000	900,000	440,000
Construct Access Roads	40,000	270,000	70,000
Landside Subtotal	**$14,275,000**	**$10,353,000**	**$11,176,000**
Engineering & Contingencies	3,569,000	2,588,500	2,794,000
TOTAL LANDSIDE COSTS	**$17,844,000**	**$12,941,500**	**$13,970,000**

Note: [1] Does not include the long-term parking area

The costs associated with each landside development alternative are similar in nature, with the exception of conventional hangar cost, shown in **Table 5C**. The cost of conventional hangar construction in Alternative A is nearly double that of Alternatives B or C, since this alternative includes an additional conventional hangar (at a cost of approximately $3.0 million).

The cost of land acquisition does not include the cost associated with Lots 29, 30 and 31. The costs associated with these parcels may be resolved by transferring land between two County Departments. Lots 29, 30 and 31 are owned by the County's Solid Waste Department and could be traded for other properties. Lot 36 is not owned by the County, therefore, it would need to be purchased.

LANDSIDE DEVELOPMENT RECOMMENDATIONS

Because the existing commercial terminal area is currently constrained and will become increasingly constrained, it is recommended that redevelopment of McClellan-Palomar Airport occur as identified in **Landside Alternative A.** For the most part, the new terminal building will be in the same location as the existing facility. By leaving the terminal building in the existing location, convenient access can be provided via Palomar Airport Road, with some improvements to the access loop

through the terminal area. The potential for a long-term parking area in Lots 29, 30, and 31 will provide the Airport with the ability to accommodate long-range capacity.

The existing tiedown and T-hangar area would be redeveloped to eliminate, to the extent possible, the interaction between structures and the landfill area. The acquisition of Lot 36 would provide an area for additional T-hangar development outside the landfill area. The development identified in Landside Alternative A would satisfy a significant portion of the "unconstrained" based aircraft forecast.

AIRPORT DEVELOPMENT SUMMARY AND CONCLUSIONS

This chapter has attempted to outline alternative solutions to the key development issues at McClellan-Palomar Airport. Those key issues involved a displaced threshold, the location of the commercial terminal facilities, the redevelopment of the general aviation area, and the adequacy of ground access to the landside facilities.

The recommended alternatives maintain the functional separation of commercial and general aviation activities. The following is a summary of the recommendations:

- Provide a 300 foot displaced threshold addition to the east;
- Acquire Lot 36 for the development of a T-hangar area;
- Redevelop the existing general aviation areas, eliminating to the fullest extent structure interaction with the landfill areas;
- Provide adequate ground access to both commercial service and general aviation areas;
- Acquire land to protect the RPZs.

At this point, a basic recommended concept has been proposed for McClellan-Palomar Airport. Pending review of this chapter and input from the Technical Advisory Committee (TAC), the following chapters will present a refinement of this basic concept into a final plan with recommendations and timing for the program.

POLICY DECISIONS AFFECTING AIRPORT DEVELOPMENT

In order to accommodate the recommended development items, the existing policy decisions will need to be complied with. The San Diego County Board of Supervisors Policy F-44 is scheduled to expire on December 31, 1995. A "sunset" review of this policy will be initiated at that time.

The requirements of City of Carlsbad Ordinance 21.53.015 would need to be met before the acquisition of Lot 36. The expansion of the airport into this area requires voter approval prior to any development.

DEVELOPMENT OF CONSTRAINED AVIATION FORECASTS

Based on the physical characteristics of the airport and the development recommendations, it was determined how much of the "unconstrained" forecast would

be accommodated at the improved McClellan-Palomar Airport. **Table 5D, Comparison of Forecasts**, presents a comparison of the "unconstrained" and "constrained" forecast. As shown in **Table 5D**, the ability of the airport facilities to accommodate the "unconstrained" forecast number of based aircraft would appear to be the only significant difference in the two forecasts. It is anticipated that the "constrained" based aircraft capacity, based on the recommended airport development shown in Landside Alternative A, would be approximately 575 based aircraft.

The operational level is anticipated to slightly decrease, due to the decrease in the number of based aircraft operations (local operations). It is anticipated that the annual operational level would be reduced by approximately 9,000 operations. The ultimate operational level of McClellan-Palomar Airport will also be affected by the ability of air traffic control to accommodate the amount of traffic.

It is anticipated that the "unconstrained" passenger enplanement level can be accommodated at McClellan-Palomar Airport. Based on the recommended development, the airport can be expected to accommodate the approximately 65,000 annual enplanements by the year 2015. It should be noted, that the forecast enplanements do not take into account the effect of air travel requirements as a result of the LEGO Land and Point Resort Hotel and Conference facilities, scheduled to open in 1999.

TABLE 5D
Comparison of Forecasts
McClellan-Palomar Airport

	2015 "Unconstrained"	2015 "Constrained"
Total Based Aircraft	610	575
Total Annual Operations	289,110	280,000
Annual Enplanements	65,000	65,000

Chapter Six

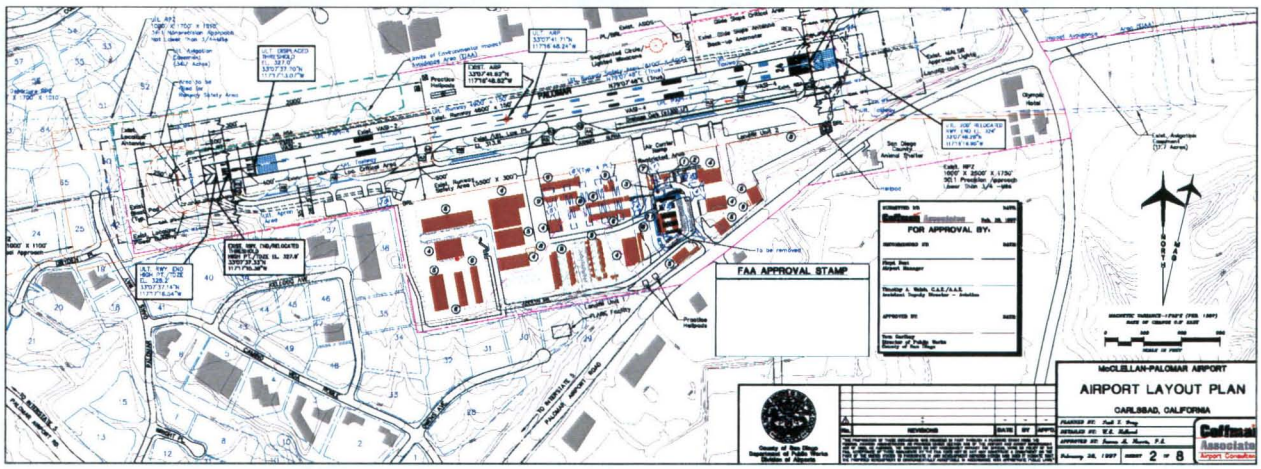
AIRPORT PLANS

McCLELLAN-PALOMAR AIRPORT

Chapter Six

McCLELLAN-PALOMAR AIRPORT

AIRPORT PLANS



In Chapter Five, a recommendation was made for the future development of McClellan-Palomar Airport. As determined in the previous chapters, new airside and landside facilities will be necessary to meet the ultimate forecast demand.

Since the completion of the Alternatives Chapter and the associated Planning Advisory Committee (PAC) meeting, the County has provided comments and direction as to the future development at McClellan-Palomar Airport. It was determined by the County that no additional lands would be acquired, other than avigation easements, that the maintenance/runup area would be removed from the plan, and that FAR Part 139 related improvements would be completed in the short term. In December 1996, the airport received their FAR Part 139 certificate. In addition, after further evaluation, the County determined that only 200 feet of runway length could be added to the east end of Runway 6-24 due to potential environmental impacts related to the landfill.

The purpose of this chapter is to describe, in narrative and graphic form, the recommended development through the 20-year planning period. Based on input from County officials, the Planning Advisory Committee, and the recently received FAR Part 139 certificate, the existing facilities and recommended improvements presented in the previous chapter have been modified and reflected in this chapter.

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 Data Sheet
- Airport Layout Plan

- Terminal Area Plan
- Part 77 Airspace Plan
- Approach Zones Plans
- Runway Protection Zones Plans
- On-Airport Land Use 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 McClellan-Palomar 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, McClellan-Palomar Airport would ultimately be expected to serve aircraft in Approach Category D (approach speeds between 141 and 166 knots). In addition, a number of aircraft anticipated to operate at the airport would be in Airplane Design Group III (aircraft with wingspans less than 118 feet). The airfield facilities were, therefore, designed to accommodate D-III aircraft. The load bearing strength of the primary runway should be maintained at 60,000 pounds single-wheel loading (SWL), which would accommodate the anticipated types of aircraft during the planning period.

The FAA design standards used in planning the airside facilities are listed in **Table 6A.** 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. Examples of existing facilities at McClellan-Palomar Airport that do not meet design standards include the runway safety area length beyond the end of Runway 6 and the separation between the runway and parallel taxiway, among others. These items are identified in **Table 6A** and on the Airport Layout Plan.

TABLE 6A
Airport Design Standards
McClellan-Palomar Airport

Descriptor	D-III Standards	Existing 6-24	Ultimate 6-24
Runway Length (ft)	N/A	4,600	4,900
Runway Width (ft)	100	150	150
Runway Strength (thousand lbs)	N/A	60,000 SWL	60,000 SWL
Runway Safety Area Length (beyond the end of the runway (ft))	1,000	200[1]/1,000	300[1]/1,000
Runway Safety Area Width (ft)	500	440[1]	440[1]
Runway Object Free Area Length (beyond the end of the runway (ft))	1,000	1,000/300[1]	1,000/300[1]
Runway Object Free Area Width (ft)	800	400[1]	400[1]
Runway Protection Zones	N/A	V/P	NP/P
Parallel Taxiway Width (ft)	50	75	75
Parallel Taxiway Strength (lbs)	N/A	60,000 SWL	60,000 SWL
Runway Centerline to:			
Parallel Taxiway (ft)	400	287.5[1]	287.5[1]
Aircraft Parking (ft)	500	350[1]	350[1]
Building Restriction Line (ft)	745[2]	500	500
Taxiway Centerline to:			
Parallel Taxilane (ft)	152	N/A	N/A
Fixed or Movable Object (ft)	93	93	93
Taxilane Centerline to:			
Parallel Taxilane (ft)	140	95[3]	95[3]
Fixed or Movable Object (ft)	81	57.5[3]	57.5[3]

Notes: SWL - Single Wheel Loading, V - Visual, NP - Nonprecision, P - Precision, N/A - Not Applicable
[1] - Separations less that D-III standards will be requested as Modification to Standard.
[2] - The Building Restriction Line (BRL) provides adequate precision approach imaginary surface clearance for a 35 foot tall building. The BRL may be adjusted for buildings/objects of lesser height in relationship to the runway elevation at that location.
[3] - Airplane Design Group II standards within existing and ultimate tiedown area.
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 both the *Airport Data Sheet* (**Sheet No. 1**) and the *ALP* (**Sheet No. 2**) to describe the 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 and plans in this report show these development stages in detail (see Chapter Seven). The following discusses the airfield related development recommendations.

RUNWAY 6-24

Runway 6-24 was 4,700 feet in length until the Airport received its FAR Part 139 Certificate. A 100-foot relocated threshold on Runway 6 was required for additional runway safety area, therefore the existing runway length is now 4,600 feet. Runway 6-24 is planned to be utilized by a variety of general aviation aircraft and commuter type aircraft during the 20-year planning period. Ultimate airside development includes a 200-foot addition to the threshold of Runway 24, as well as an extension to the parallel taxiway. This additional runway pavement will provide an ultimate runway length of 4,900 feet. The ultimate Runway 6 end will include the removal of the 100-foot relocated threshold, however, will include a 300-foot displacement to accommodate additional runway safety area. Fill and grading will also be required between the localizer antenna and the beginning of Runway 6 in order to accommodate an additional 100 feet of safety area. In addition to these development items, construction of two high-speed taxiway exits and runup areas are included.

The High Intensity Runway Lighting (HIRL) and Medium Intensity Taxiway Lighting (MITL) will be extended and Precision Approach Path Indicators (PAPIs) installed. Non-precision approach capability is planned for Runway 6 utilizing the Global Positioning System (GPS) technology; therefore, non-precision runway markings will need to be installed. Precision approach capability will continue to Runway 24 with the Instrument Landing System (ILS), as well as the potential for additional capabilities utilizing GPS technology.

AVIGATION EASEMENT

The ALP also depicts avigation easements proposed at McClellan-Palomar Airport. This property includes approximately 38.2 acres not currently under the airport's jurisdiction (portions of both RPZs). The avigation easements associated with the RPZ parcels should be acquired for approach protection.

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 through FY2000. Stage I includes the following major airside development items: the construction of the additional 200-feet of runway and taxiway, and the installation of PAPIs, HIRLs, MITLs and airfield signage.

Projects identified in the **Stage II** development program encompass the five year period from FY2001 through FY2005. The major projects associated with Stage II development include the construction of high-speed exit taxi-ways, and a lighted heliport.

Stage III contains projects for the longer range needs of the airport that will be accomplished during the period FY2006 to

FY2015. The airside project associated with this stage relates to pavement preservation.

TERMINAL AREA PLAN

The *Terminal Area Plan*, **Sheet No. 3**, represents a refinement of the selected development configuration and provides a more detailed drawing of the terminal area facilities. The following is the suggested staging.

Stage I landside development consists of the construction of a commercial service terminal building, terminal access road, terminal auto parking structure, aircraft washrack, and apron rehabilitation.

Projects identified in the **Stage II** development program include the installation of T-hangars, conventional hangars and tiedowns. Expansion of the fuel storage capacity will also be conducted during this stage.

Stage III terminal area development includes the continued expansion of the fuel storage capacity and pavement preservation.

PART 77 AIRSPACE PLAN

The *Part 77 Airspace Plan* for McClellan-Palomar Airport, **Sheet No. 4**, 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 McClellan-Palomar Airport is based on large aircraft (aircraft over 12,500 pounds) precision approach to Runway 24, and large aircraft non-precision approach to Runway 6. 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 McClellan-Palomar Airport are indicated on **Sheet No. 4**. These obstruction are also identified on the *NOAA Airport Obstruction Chart (OC 5310)*. 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 6-24 at McClellan-Palomar Airport is 1,000 feet in width, extends 200 feet beyond each runway end and is centered on the runway. There are eight obstructions to the primary surface at McClellan-Palomar Airport. These obstructions include bushes, terrain, a sign, the glide slope antenna, a windsock, and a fence. It is recommended that an FAA Aeronautical Study be performed to determine if any of these represent a hazard to navigable airspace.

TRANSITION SURFACES

The transition imaginary surface is a surface used to join two other surfaces together. The transition surface has a slope of 7 to 1 and joins the primary surface to the approach and horizontal surfaces. There are eight obstructions to the transition surface at McClellan-Palomar Airport. These obstructions are associated with a number of trees, the ATCT, a hangar, and a light standard. It is recommended that an FAA Aeronautical Study be performed to determine if any of these represent a hazard to navigable airspace.

HORIZONTAL SURFACE

The horizontal surface is established at 150 feet above the highest airport elevation. The horizontal surface has a radius of 10,000 feet from the ends of each runway, with a tangent line connecting the arcs. There are nine obstructions to the horizontal surface at McClellan-Palomar Airport. These obstructions include terrain, trees, bushes, light poles, and transmission towers. It is recommended that an FAA Aeronautical Study be performed to determine if any of these are a hazard to navigable airspace.

CONICAL SURFACE

The conical surface for McClellan-Palomar Airport is 4,000 feet in length and slopes away from the horizontal surface at a 20 to 1 slope to a height of 350 feet above the established airport elevation. Based on the ultimate airport development, two bushes were identified as obstructions within the conical surface at McClellan-Palomar Airport. It is recommended that an FAA Aeronautical Study be performed to determine if any of these are a hazard to navigable airspace.

APPROACH ZONE PLANS

The *Approach Zones Profiles*, **Sheet No. 5**, 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 to be served.

The approach slopes for the precision approach to Runway 24 are 50 to 1, beginning 200 feet from the runway end, for 10,000 feet and 40 to 1 for an additional 40,000 feet. The non-precision approach slopes to Runway 6 are 34 to 1 for 10,000 feet. There were 12 obstructions identified within these approach slopes. These include poles, bushes, light standards, trees, and terrain. It is recommended that an FAA Aeronautical Study be performed to determine if any of these are a hazard to navigable airspace.

RUNWAY PROTECTION ZONES PLANS

The *Runway Protection Zones Plans*, **Sheet No. 6**, 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 RPZ for Runway 24 is sized for large aircraft providing precision instrument approach capabilities. The RPZ for Runway 6 is sized for large aircraft providing non-precision approach capabilities. It is not anticipated that grading or leveling would be conducted within the RPZs, thus eliminating the potential for environmental impacts.

ON-AIRPORT LAND USE PLAN

The objective of the *On-Airport Land Use Plan*, **Sheet No. 7**, is to locate land uses within the airport environs so that they are compatible and able to function without major constraints or annoyance.

Four major categories of land uses are depicted on the *On-Airport Land Use Plan*: Airfield, Aviation Related Revenue Support, Non-Aviation Related Revenue Support, and Not to be Impacted. 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. The Not to be Impacted designation includes those environmentally sensitive areas that are not intended to be disturbed.

As indicated on the *On-Airport Land Use Plan*, the approximate size of the Airfield, Aviation Related Revenue Support, Non-Aviation Related Revenue Support, and Not to be Impacted categories are approximately 139.3 acres, 72.6 acres, 78.2 acres, and 197.4 acres, respectively.

The *On-Airport Land Use Plan* is designed to provide basic guidance for the County in making decisions related to on-airport development at McClellan-Palomar Airport.

AIRPORT PROPERTY MAP

The *Airport Property Map*, **Sheet No. 8**, depicts the property that was acquired in order to construct McClellan-Palomar Airport, along with the proposed/potential land acquisition during the 20-year planning period. For each parcel acquired deed information is indicated including the recorder's number, date recorded, acreage, and a description.

SUMMARY

The Airport Plans Set is designed to provide basic guidance for the County in making decisions relative to future development at McClellan-Palomar Airport. The 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

McCLELLAN-PALOMAR AIRPORT

CARLSBAD, CALIFORNIA

AIRPORT LAYOUT PLANS

INDEX OF DRAWINGS

AIP #3-06-0036-07

County of San Diego
Department of Public Works
Division of Airports

Coffman Associates
Airport Consultants

AIRPORT DATA

McCLELLAN-PALOMAR AIRPORT (CRQ)

CITY: CARLSBAD | COUNTY: SAN DIEGO, CALIFORNIA

RANGE: N/A | TOWNSHIP: N/A | CIVIL TOWNSHIP: N/A

		EXISTING	ULTIMATE
AIRPORT SERVICE LEVEL		COMMERCIAL SERVICE	SAME
AIRPORT REFERENCE CODE		B-II	D-III
AIRPORT ELEVATION		328.75' (MSL)	SAME
MEAN MAXIMUM TEMPERATURE OF HOTTEST MONTH		77° (July)	SAME
AIRPORT REFERENCE POINT	Latitude	33°07'41.53"N	33°07'41.81"N
(ARP) COORDINATES (NAD 83)	Longitude	117°16'49.39"W	117°16'47.66"W
AIRPORT and TERMINAL NAVICATIONAL AIDS		VASI-2 (RWY. 6) VASI-4, MALSR, REIL, ILS (RWY. 24) ROTATING BEACON -- -- -- -- -- --	PAPI-4 (BOTH) GPS (BOTH) MALSR REIL, ILS (RWY. 24) ROTATING BEACON -- -- -- -- -- --

NOTE: SEPARATION STANDARDS BASED ON THE CONVAIR 580 AS THE DESIGN AIRCRAFT.

RUNWAY DATA

	RUNWAY 6-24	
	EXISTING	ULTIMATE
AIRPORT REFERENCE CODE	B-II	D-III
RUNWAY AZIMUTH	79.130	SAME
RUNWAY BEARING	N79°07'48"E	SAME
RUNWAY DIMENSIONS	4700' X 150'	5000' X 150'
RUNWAY INSTRUMENTATION	VISUAL/PRECISION	NONPREC./PRECISION
RUNWAY APPROACH SURFACES	20:1/50:1	34:1/50:1
RUNWAY THRESHOLD DISPLACEMENT	NONE/NONE	400'/300'
RUNWAY STOPWAY	NONE/NONE	SAME
RUNWAY SAFETY AREA	5500' X 300'	6200' X 400'
RUNWAY OBSTACLE FREE ZONE	5000' X 400'	5400' X 400'
RUNWAY OBJECT FREE AREA	5800' X 600'	6300' X 600'
PAVEMENT MATERIAL	ASPHALT	SAME
PAVEMENT SURFACE TREATMENT	PFC	SAME
PAVEMENT STRENGTH (in thousand lbs.)[1]	60(S), 80(D), 110(DT)	SAME
RUNWAY EFFECTIVE GRADIENT (in %)	0.31	SAME
RUNWAY MARKING	VISUAL/PRECISION	NONPREC./PRECISION
RUNWAY LIGHTING	HIRL	SAME
RUNWAY APPROACH LIGHTING	NONE/MALSR	SAME
TAXIWAY LIGHTING	MITL	SAME
TAXIWAY MARKING	CENTERLINE/EDGE	SAME
NAVIGATIONAL/VISUAL AIDS	VASI-2/VASI-4 ILS (RWY. 24) MALSR (RWY. 24) REIL (RWY. 24) ROTATING BEACON	GPS (BOTH) ILS (RWY. 24) PAPI-4 (BOTH) MALSR (RWY. 24) REIL (RWY. 24) ROTATING BEACON

[1] Pavement strengths are expressed in Single(S), Dual(D), Dual Tandem(DT) wheel loading capacities.

DECLARED DISTANCES

	RUNWAY 6-24	
	EXISTING [1]	ULTIMATE [2]
TAKEOFF RUN AVAILABLE (TORA)	N/A	5000'/5000'
TAKEOFF DISTANCE AVAILABLE (TODA)	N/A	5000'/5000'
ACCELERATE-STOP DISTANCE AVAILABLE (ASDA)	N/A	5000'/4600'
LANDING DISTANCE AVAILABLE (LDA)	N/A	4600'/4300'

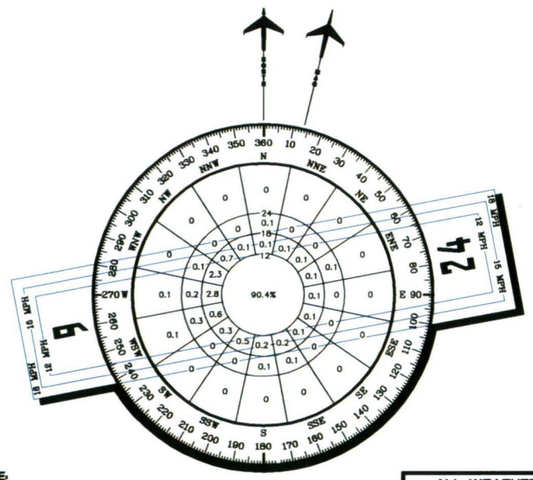
[1] Existing condition based on ARC B-II with FAR Part 139 Certification. Assumes the requested Modification to Standards will be approved.

[2] Ultimate distances based on ARC D-III with FAR 139 Certification. Assumes that Modification to Standards will be approved. Remaining drawings, however, do not indicate the associated displaced thresholds needed for FAR Part 139 approval.

RUNWAY END COORDINATES (NAD 83)		EXISTING	ULTIMATE
RUNWAY 6	Latitude	33°07'37.14"N	33°07'37.14"N
	Longitude	117°17'16.53"W	117°17'16.53"W
RUNWAY 24	Latitude	33°07'45.91"N	33°07'46.47"N
	Longitude	117°16'22.25"W	117°16'18.79"W
RUNWAY 6 THRESHOLD	Latitude	--	33°07'37.89"N
	Longitude	--	117°17'11.91"W
RUNWAY 24 THRESHOLD	Latitude	--	33°07'45.91"N
	Longitude	--	117°16'22.25"W

MODIFICATION TO FAA AIRPORT DESIGN STANDARDS

DEVIATION DESCRIPTION	EFFECTED DESIGN STANDARD	STANDARD	AVAILABLE	PROPOSED DISPOSITION
EXIST. RWY 24 SAFETY AREA	RUNWAY SAFETY AREA LENGTH	600' BEYOND RUNWAY END	200'	REQUEST MODIFICATION FOR REMAINING 400'
EXIST. RWY 24 OBJECT FREE AREA	RUNWAY OBJECT FREE AREA LENGTH	600' BEYOND RUNWAY END	300' BEYOND RUNWAY END	REQUEST MODIFICATION FOR REMAINING 300'
EXIST. RUNWAY-TAXIWAY SEPARATION	RUNWAY-TAXIWAY SEPARATION	300'	287.5'	REQUEST MODIFICATION
EXIST. AIRCRAFT PARKING	RUNWAY CENTERLINE TO AIRCRFAT PARKING	400'	350'	REQUEST MODIFICATION
ULT. RUNWAY 24 SAFETY AREA	RUNWAY SAFETY AREA LENGTH	1000' BEYOND RUNWAY END	200' BEYOND RUNWAY END	DISPLACE RUNWAY TRESHOLD 400' AND REQUEST MODIFICATION FOR REMAINING 400'
ULT. RUNWAY 24 OBJECT FREE AREA	RUNWAY OBJECT FREE AREA LENGTH	1000' BEYOND RUNWAY END	300' BEYOND RUNWAY END	DISPLACE RUNWAY TRESHOLD 400' AND REQUEST MODIFICATION FOR REMAINING 300'
ULT. RUNWAY SAFETY AREA	RUNWAY SAFETY AREA WIDTH	500'	440'	REQUEST MODIFICATION
ULT. RUNWAY OBJECT FREE AREA	RUNWAY OBJECT FREE AREA WIDTH	800'	440'	REQUEST MODIFICATION
ULT. RUNWAY-TAXIWAY SEPARATION	RUNWAY-TAXIWAY SEPARATION	400'	287.5'	REQUEST MODIFICATION
ULT. AIRCRAFT PARKING	RUNWAY CENTERLINE TO AIRCRFAT PARKING	500'	350'	REQUEST MODIFICATION
DRAINAGE CURB WITHIN TAXIWAY OBJECT FREE AREA	TAXIWAY OBJECT FREE AREA	131'	110'	REQUEST MODIFICATION

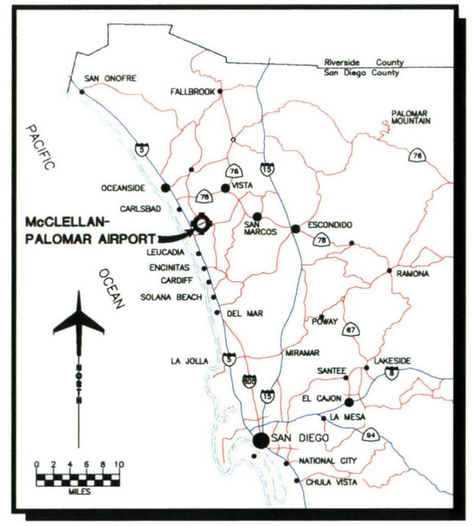


SOURCE:
McCLELLAN-PALOMAR AIRPORT
CARLSBAD, CALIFORNIA

OBSERVATIONS:
Hourly Observations
1968-1977

ALL WEATHER
WINDROSE

ALL WEATHER WIND COVERAGE	12 M.P.H.	15 M.P.H.	18 M.P.H.
Runway 6-24	97.95%	98.65%	99.75%



VICINITY MAP

LOCATION MAP
NOT TO SCALE

County of San Diego
Department of Public Works
Division of Airports

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 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."

McCLELLAN-PALOMAR AIRPORT

AIRPORT DATA SHEET

CARLSBAD, CALIFORNIA

PLANNED BY: Scott T. Gray
DETAILED BY: W.S. Holland
APPROVED BY: Jeannette V. Coffman
November 15, 1996 | SHEET 1 OF 8

Coffman Associates
Airport Consultants

Coffman Associates (2002A1A.DWG 11-15-1996 10:18)

LEGEND

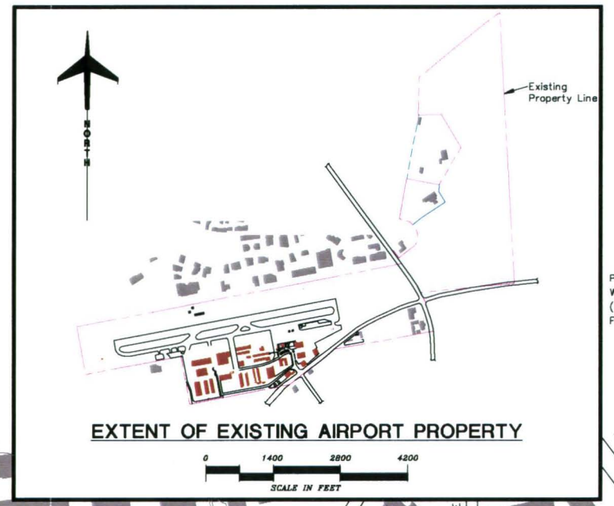
EXISTING	ULTIMATE	DESCRIPTION
		AIRCRAFT TIEDOWNS (PARKING)
		AIRPORT PROPERTY LINE (See Note 6.)
		AIRPORT REFERENCE POINT (ARP)
		AIRPORT ROTATING BEACON
		AVIGATION EASEMENT
		BUILDING CONSTRUCTION
	BRL	BUILDING RESTRICTION LINE (BRL)
		DRAINAGE
		FACILITY CONSTRUCTION
		FENCING
VASI-4	PAPI-4	NAVIGATIONAL AID INSTALLATION
		RUNWAY END IDENTIFICATION LIGHTS (REIL)
		RUNWAY THRESHOLD LIGHTS
		SEGMENTED CIRCLE/WIND INDICATOR
1080		TOPOGRAPHIC CONTOURS (See Note 5.)
		WIND INDICATOR

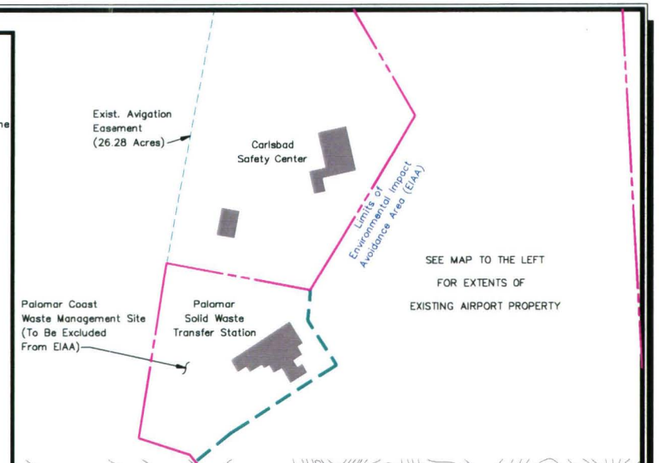
BUILDINGS/FACILITIES

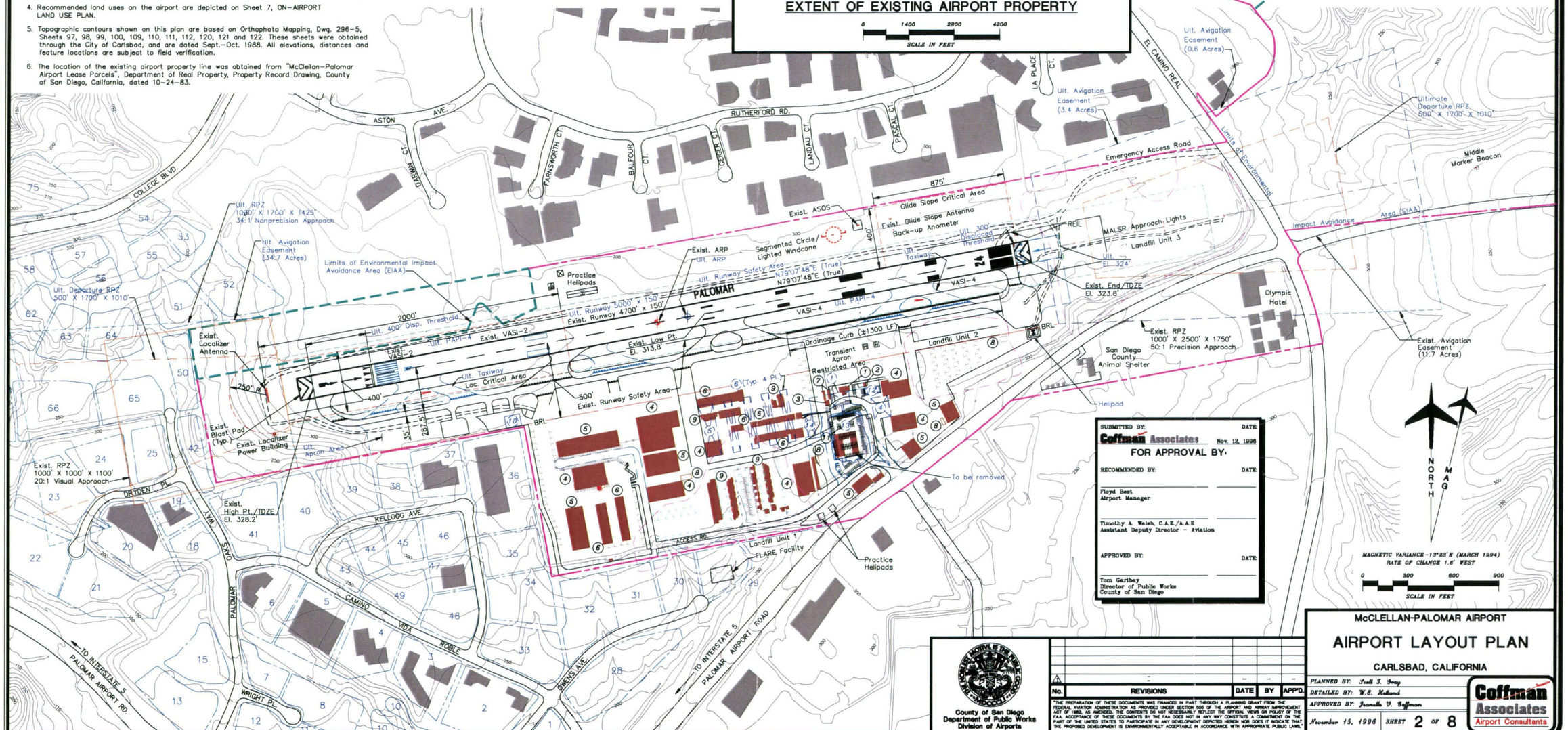
EXISTING	ULTIMATE	DESCRIPTION
1	1	AIRPORT ADMINISTRATION/TERMINAL BUILDING
2	–	FAA AIR TRAFFIC CONTROL TOWER (ATCT)
3	–	EMERGENCY EQUIPMENT
4	–	FIXED BASE OPERATOR HANGAR (FBO)
5	5	CONVENTIONAL HANGAR
6	6	T-HANGARS
7	–	COMMUTER AIRLINE FACILITY
8	–	UNDERGROUND FUEL STORAGE FACILITY
9	–	PORT-A-PORTS (TO BE REMOVED)
10	10	AIRCRAFT WASHRACK
11	–	AIR CARGO LOADING/UNLOADING AREA
--	12	ARFF/MAINTENANCE FACILITY
--	13	2-LEVEL PUBLIC PARKING STRUCTURE
--	14	GENERAL AVAIATION TERMINAL/RESTAURANT

GENERAL NOTES:

1. Details of the Airport Windrose, Airport and Runway Data, and Modification to FAA Airport Design Standards are depicted on Sheet 1, AIRPORT DATA SHEET.
2. Depiction of features and objects, including related elevations within the runway protection zones are depicted on Sheet 6, RUNWAY PROTECTION ZONES PLANS AND PROFILES.
3. Details concerning terminal improvements are depicted on Sheet 2, TERMINAL AREA PLAN.
4. Recommended land uses on the airport are depicted on Sheet 7, ON-AIRPORT LAND USE PLAN.
5. Topographic contours shown on this plan are based on Orthophoto Mapping, Dwg. 296-5, Sheets 97, 98, 99, 100, 109, 110, 111, 112, 120, 121 and 122. These sheets were obtained through the City of Carlsbad, and are dated Sept.-Oct. 1988. All elevations, distances and feature locations are subject to field verification.
6. The location of the existing airport property line was obtained from "McClellan-Palomar Airport Lease Parcels", Department of Real Property, Property Record Drawing, County of San Diego, California, dated 10-24-83.







SUBMITTED BY: Coffman Associates DATE: Nov. 12, 1996

FOR APPROVAL BY:

RECOMMENDED BY: DATE:

Floyd Best
Airport Manager

Timothy A. Walsh, C.A.E./A.A.E
Assistant Deputy Director - Aviation

APPROVED BY: DATE:

Tom Garibay
Director of Public Works
County of San Diego

MAGNETIC VARIANCE-13°23'E (MARCH 1994)
RATE OF CHANGE 1.6' WEST

0 300 600 900
SCALE IN FEET

County of San Diego
Department of Public Works
Division of Airports

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 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."

McCLELLAN-PALOMAR AIRPORT

AIRPORT LAYOUT PLAN

CARLSBAD, CALIFORNIA

PLANNED BY: Scott J. Gray
DETAILED BY: W.S. Holland
APPROVED BY: Jeannette V. Coffman
November 15, 1996

SHEET 2 OF 8

Coffman Associates
Airport Consultants

Coffman Associates CROALP.DWG 11-15-1996 10:40

LEGEND

EXISTING	ULTIMATE	DESCRIPTION
		AIRCRAFT TIEDOWNS (PARKING)
		AIRPORT PROPERTY LINE (See Note 5.)
		AIRPORT REFERENCE POINT (ARP)
		AIRPORT ROTATING BEACON
		AVIATION EASEMENT
	BRL	BUILDING CONSTRUCTION
		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
1080		TOPOGRAPHIC CONTOURS (See Note 4.)
		WIND INDICATOR (Lighted)

BUILDINGS/FACILITIES

EXISTING	ULTIMATE	DESCRIPTION
1	1	AIRPORT ADMINISTRATION/TERMINAL BUILDING
2	–	FAA AIR TRAFFIC CONTROL TOWER (ATCT)
3	–	EMERGENCY EQUIPMENT
4	4	FIXED BASE OPERATOR HANGAR (FBO)
5	5	CONVENTIONAL HANGAR
6	6	T-HANGARS
7	–	COMMUTER AIRLINE FACILITY
8	–	UNDERGROUND FUEL STORAGE FACILITY
9	–	PORT-A-PORTS (TO BE REMOVED)
10	10	AIRCRAFT WASHRACK
--	11	ARFF/Maintenance Facility
--	12	2-LEVEL PUBLIC PARKING STRUCTURE
--	13	GENERAL AVIATION TERMINAL/RESTAURANT

GENERAL NOTES:

1. Details of the Airport Windrose, Airport and Runway Data, and Deviation From FAA Airport Design Standards are depicted on Sheet 1, AIRPORT DATA SHEET.
2. Depiction of features and objects, including related elevations within the runway protection zones are depicted on the Sheet 6, PROTECTION ZONES PLANS AND PROFILES.
3. Recommended land uses on the airport are depicted on Sheet 7, ON-AIRPORT LAND USE PLAN.
4. Topographic contours shown on this plan are based on Orthophoto Mapping, Dwg. 296-5, Sheets 97, 98, 99, 100, 109, 110, 111, 112, 120, 121 and 122. These sheets were obtained through the City of Carlsbad, and are dated Sept.-Oct. 1988. All elevations, distances and feature locations are subject to field verification.
5. The location of the existing airport property line was obtained from "McClellan-Palomar Airport Lease Parcels", Department of Real Property, Property Record Drawing, County of San Diego, California, dated 10-24-83.

PALOMAR

300

Segmented Circle/ Lighted Windcone

Exist. ASOS

Glide Slope Critical Area

Exist. Glide Slope Antenna

Back-up Anometer

Ult. Runway 5000' x 150'

Exist. Runway 4700' x 150'

Exist. ARP

Ult. ARP

24

Exist. Low Pt. El. 313.8'

Exist./Ult. Runway Safety Area

Loc. Critical Area

VASI-4

Ult. PAPI-4

Ult. Taxiway

VASI-4

TAXI

EXIST./ULT. 75' TYP.

500'

Drainage Curb (±1300 LF)

Transient Apron

H H

BRL

(Typ. 4 Pl.)

Secure Area

To be Removed

Aviation Reserve

Landfill Unit 2

Landfill Unit 1

ACCESS RD.

PALOMAR AIRPORT RD.

Practice Helipads

NORTH MAG

MAGNETIC VARIANCE-13°23'E (MARCH 1994)
RATE OF CHANGE 1.6' WEST

0 100 200 300

SCALE IN FEET

County of San Diego
Department of Public Works
Division of Airports

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McCLELLAN-PALOMAR AIRPORT

TERMINAL AREA PLAN

CARLSBAD, CALIFORNIA

PLANNED BY: Todd S. Gray
DETAILED BY: W.B. Holland
APPROVED BY: Jeanette V. Coffman
November 15, 1996

SHEET 3 OF 8

Coffman Associates
Airport Consultants

Coffman Associates ORIGINAL.DWG 11-15-1996 10:48

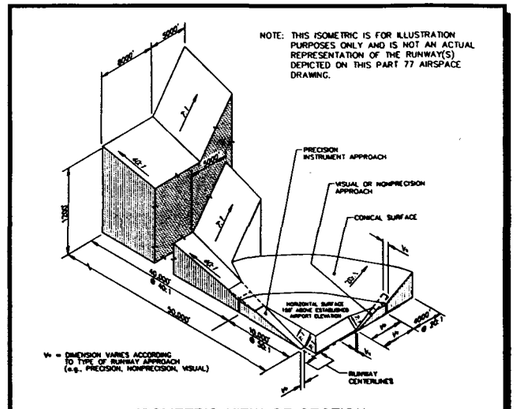
OBSTRUCTION LEGEND

- OBSTRUCTION
- GROUP or MULTIPLE OBSTRUCTIONS

OBSTRUCTION TABLE

Object Description	Object Elevation	Obstructed Part 77 Surface	Surface Elevation	Object Penetration	Proposed Object Disposition
1. Bush	340'	Primary	328'	+12'	To Be Removed
2. Ground	335'	Primary	328'	+7'	**
3. Sign	327'	Primary	323'	+4'	To Be Relocated
4. Ground	317'	Primary	313'	+4'	**
5. Tree	339'	Transition	315'	+24'	**
6. Guard Rail	320'	Primary	315'	+5'	To Be Removed
7. OL on Windsock	340'	Primary	316'	+24'	To Remain Lighted
8. OL on Glide Slope	364'	Primary	319'	+45'	To Remain Lighted
9. Bush	327'	Primary	323'	+4'	To Be Removed
10. Tree	349'	Transition	328'	+21'	**
11. Bush	332'	Primary	324'	+8'	To Be Removed
12. Tree	340'	Approach	330'	+10'	**
13. Light Standard	402'	Approach	362'	+40'	OL Light
14. OL on Flagpole	423'	Approach	369'	+54'	To Remain Lighted
15. Tree	418'	Approach	397'	+21'	Shielded by 16 & 17
16. Light Standard	442'	Approach	408'	+34'	OL Light
17. Light Standard	466'	Approach	418'	+48'	OL Light
18. Tree	464'	Approach	424'	+40'	Shielded by 19 & 20
19. Light Standard	477'	Approach	427'	+50'	OL Light
20. Light Standard	482'	Approach	435'	+47'	OL Light
21. Pole	570'	Approach	559'	+11'	OL Light
22. Tree	729'	Approach	724'	+5'	Trim
23. Ground	1200'	Approach	1072'	+128'	**
24. Ant. on Hangar	360'	Transition	337'	+23'	**
25. Tree	334'	Transition	332'	+2'	**
26. Light Standard	358'	Transition	341'	+17'	OL Light
27. Ant. on OL ATCT	397'	Transition	349'	+48'	To Remain Lighted
28. Tree	334'	Transition	331'	+3'	**
29. Tree	354'	Transition	339'	+15'	**
30. Trans. Tower	479'	Horizontal	479'	+0'	OL Light
31. Tree	532'	Horizontal	479'	+53'	**
32. Pole	524'	Horizontal	479'	+45'	OL Light
33. OL on Radio Twr.	719'	Horizontal	479'	+240'	To Remain Lighted
34. Bush	554'	Horizontal	479'	+75'	**
35. OL on Tower	709'	Horizontal	479'	+230'	To Remain Lighted
36. Ant. on OL Tower	710'	Horizontal	479'	+231'	To Remain Lighted
37. Ground	508'	Horizontal	479'	+29'	**
38. Ground	494'	Horizontal	479'	+15'	**
39. Bush	661'	Conical	648'	+13'	**
40. Bush	676'	Conical	666'	+10'	**

** Perform FAA Aeronautical Study

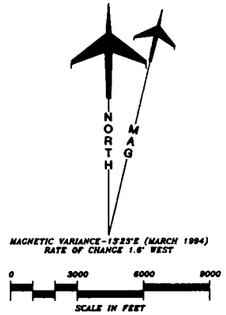


ISOMETRIC VIEW OF SECTION THRU CENTERLINE OF RUNWAYS

N.T.S.

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, are illustrated on the APPROACH ZONES PROFILES, Sheet 5 of these plans.
3. Depiction of features and objects within the inner portion of the approach surfaces, are illustrated on the PROTECTION ZONES PLAN, Sheet 6 of these plans.
4. Additional obstruction data is illustrated on National Ocean Service document OC 5310, AIRPORT OBSTRUCTION CHART.
5. Existing and future height and hazard ordinances are to be amended and/or referenced upon approval of updated PART 77 AIRSPACE PLAN.



County of San Diego
Department of Public Works
Division of Airports

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McCLELLAN-PALOMAR AIRPORT

PART 77 AIRSPACE PLAN

CARLSBAD, CALIFORNIA

PLANNED BY: Scott S. Gray
DETAILED BY: W.S. Hollund
APPROVED BY: James M. Kovels, P.E.
January 28, 1997 | SHEET 4 OF 8

Coffman Associates
Airport Consultants

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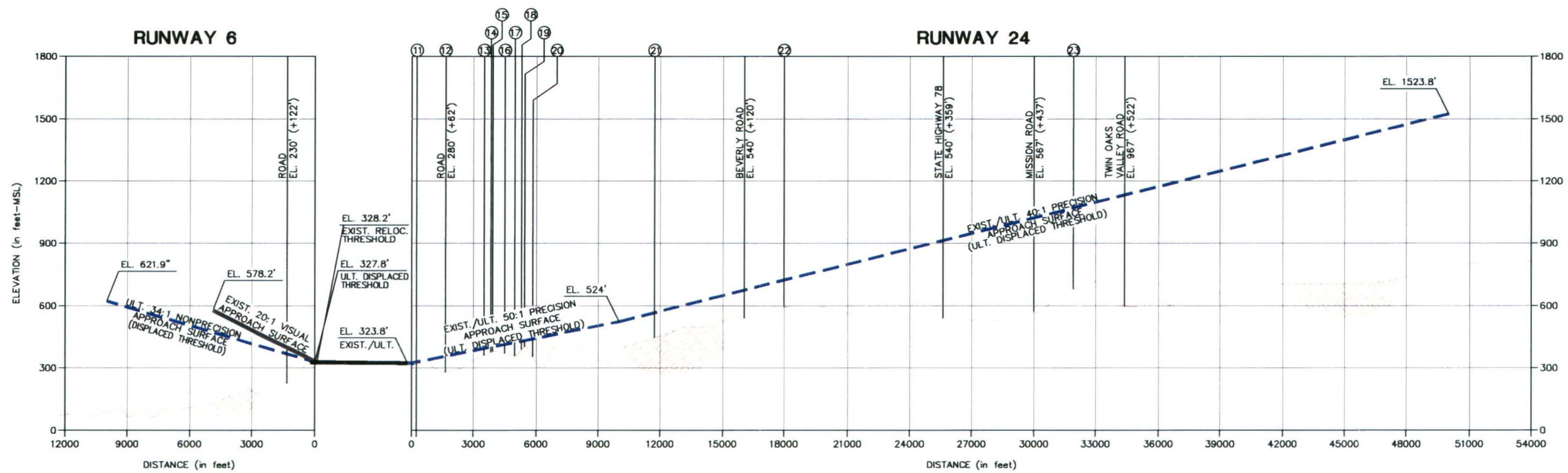

RUNWAY 6-24
APPROACH ZONES PROFILES

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, are illustrated on the APPROACH ZONES PROFILES, this sheet.
3. Depiction of features and objects within the inner portion of the approach surfaces, are illustrated on the PROTECTION ZONES PLAN, Sheet 6 of these plans.
4. Additional obstruction data is illustrated on National Ocean Service document OC 5310, AIRPORT OBSTRUCTION CHART.
5. Existing and future height and hazard ordinances are to be amended and/or referenced upon approval of updated PART 77 AIRSPACE PLAN.

OBSTRUCTION TABLE

Object Description	Object Elevation	Obstructed Part 77 Surface	Surface Elevation	Object Penetration	Proposed Object Disposition
11. Bush	332'	Approach	328'	+4'	To Be Removed
13. Light Standard	402'	Approach	393'	+9'	OL Light
14. OL on Flagpole	423'	Approach	400'	+23'	To Remain Lighted
15. Tree	418'	Approach	402'	+16'	Shielded by 16 & 17
16. Light Standard	442'	Approach	413'	+29'	OL Light
17. Light Standard	466'	Approach	423'	+43'	OL Light
18. Tree	464'	Approach	429'	+35'	Shielded by 19 & 20
19. Light Standard	477'	Approach	432'	+45'	OL Light
20. Light Standard	482'	Approach	440'	+40'	OL Light
21. Pole	570'	Approach	566'	+4'	OL Light
22. Tree	729'	Approach	723'	+6'	Trim
23. Ground	1200'	Approach	1071'	129'	**

** Perform FAA Aeronautical Study

County of San Diego
Department of Public Works
Division of Airports

No.	REVISIONS	DATE	BY	APP'D.
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McCLELLAN-PALOMAR AIRPORT

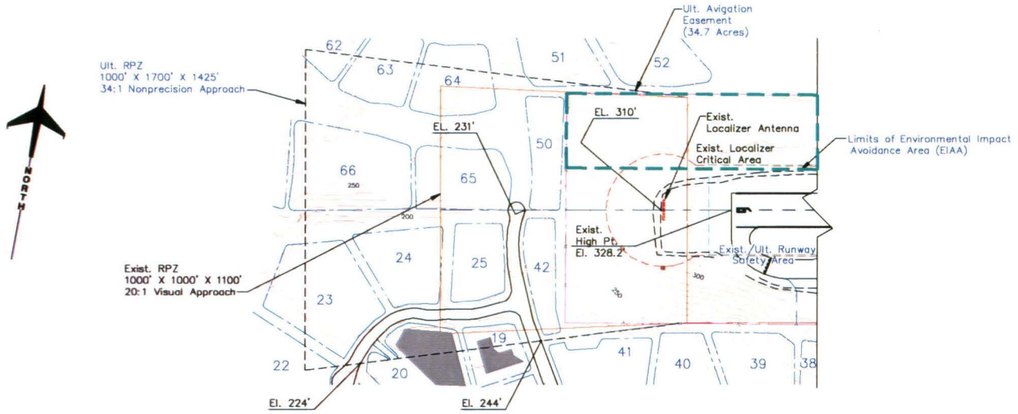
APPROACH ZONES PROFILES

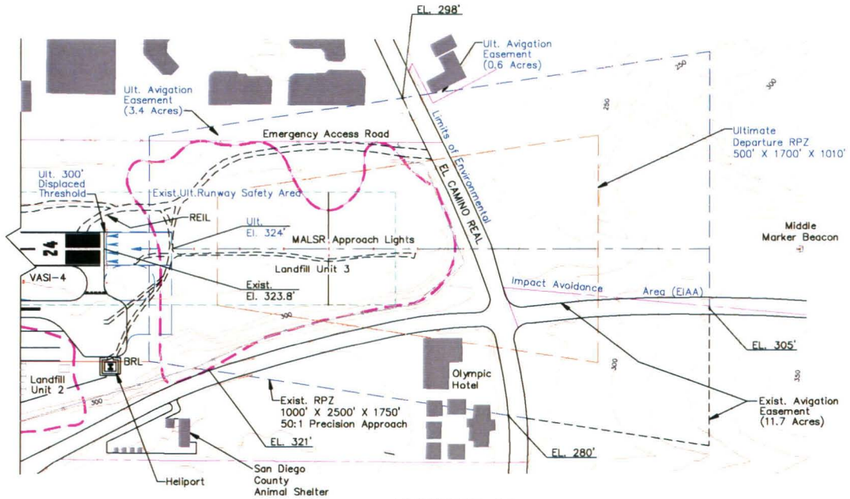
CARLSBAD, CALIFORNIA

PLANNED BY: Scott T. Gray
DETAILED BY: W.S. Holland
APPROVED BY: Jeanelle V. Coffman

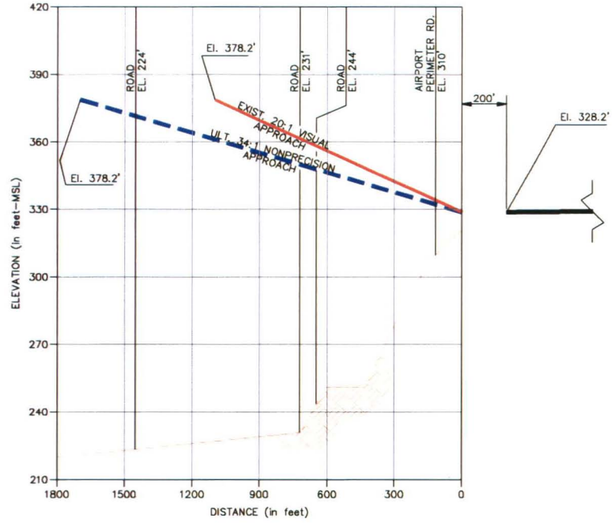
November 15, 1996 SHEET 5 OF 8

Coffman Associates Airport Consultants

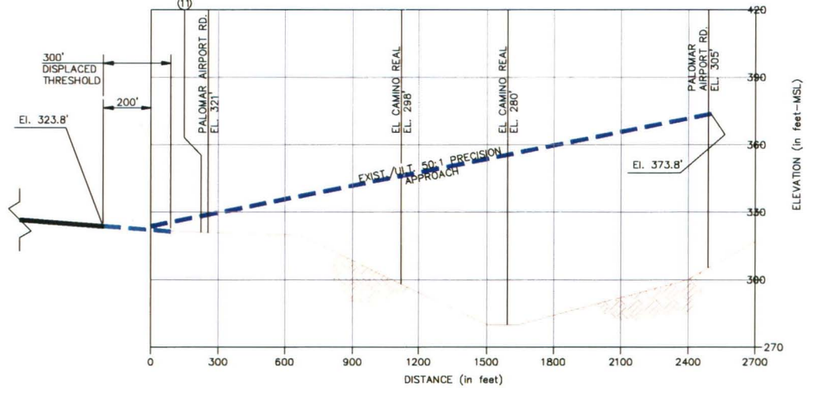




RUNWAY 6



RUNWAY 24



RUNWAY 6-24
PROTECTION ZONES PLANS AND PROFILES

HORIZONTAL: 0, 300, 600, 900 — SCALE IN FEET

VERTICAL: 0, 30, 60, 90 — SCALE IN FEET

OBSTRUCTION TABLE

Object Description	Object Elevation	Obstructed Part 77 Surface	Surface Elevation	Object Penetration	Proposed Object Disposition
11. Bush	332'	Approach	328'	+4'	To Be Removed

County of San Diego
Department of Public Works
Division of Airports

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McCLELLAN-PALOMAR AIRPORT

RUNWAY PROTECTION ZONES PLANS AND PROFILES

CARLSBAD, CALIFORNIA

PLANNED BY: Frank S. Gray
DETAILED BY: W.B. Holland
APPROVED BY: Jeannette V. Coffman
November 15, 1996 SHEET 6 OF 8

Coffman Associates
Airport Consultants

LEGEND

EXISTING AIRPORT PROPERTY LINE

ULTIMATE AIRPORT PROPERTY LINE

ON-AIRPORT LAND USE LEGEND

- AIRFIELD OPERATIONS (146.5 ACRES)
- AVIATION RELATED REVENUE SUPPORT (66.9 ACRES)
- NON-AVIATION REVENUE SUPPORT (75.5 ACRES)
- NOT TO BE IMPACTED (199.7 ACRES)

SEE MAP TO THE LEFT FOR EXTENTS OF EXISTING AIRPORT PROPERTY

Ult. Avigation Easement (26.28 Acres)

Palomar Coast Waste Management Site (To Be Excluded From EIAA)

Ult. Avigation Easement (0.6 Acres)

Ult. Avigation Easement (3.4 Acres)

Ult. Avigation Easement (34.7 Acres)

Limits of Environmental Impact Avoidance Area (EIAA)

Exist. Avigation Easement (11.7 Acres)

Ult. Runway 5000' x 150'
Exist. Runway 4700' x 150'

PALOMAR

24

Landfill Unit 2

Landfill Unit 1

EL CAMINO REAL

ASTON AVE

RUTHERFORD RD

FARNSWORTH CT

BALFOUR CT

GEIGER CT

LANDAU CT

PASCAL CT

LA PLACE CT

COLLEGE BLVD

DARIEN PL

WAY

OAKS

KELLOGG AVE

CAMINO VIDA ROBLE

WRIGHT PL

OWENS AVE

Access Rd.

Emergency Access Road

TO INTERSTATE 5
PALOMAR AIRPORT RD.

TO INTERSTATE 5
PALOMAR AIRPORT ROAD

MAGNETIC VARIANCE-13°23'E (MARCH 1994)
RATE OF CHANGE 1.6' WEST

0 300 600 900
SCALE IN FEET

County of San Diego
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McCLELLAN-PALOMAR AIRPORT

ON-AIRPORT LAND USE PLAN

CARLSBAD, CALIFORNIA

PLANNED BY: Josh J. Gray
DETAILED BY: W.B. Holland
APPROVED BY: Kenneth V. Coffman

November 15, 1996 | SHEET 7 OF 8

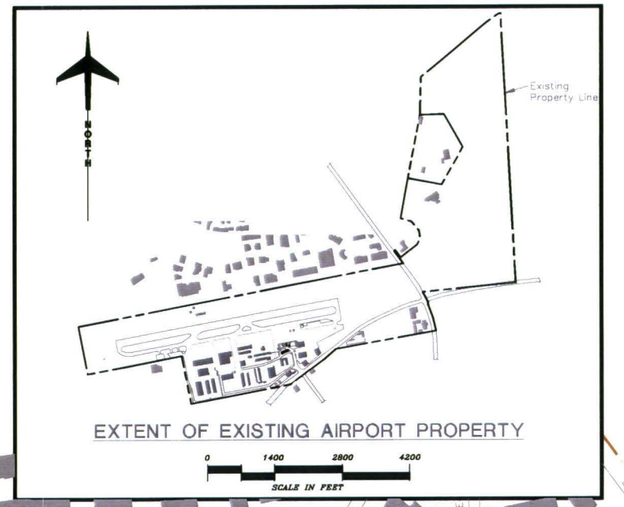
Coffman Associates
Airport Consultants

Coffman Associates D:\DGLUP.DWG 11-15-1996 11:06

DEED REFERENCE
McCLELLAN-PALOMAR AIRPORT

Recorder's Number	Date Recorded	Acreage (See Note <1>)	Description
Book 6268 Page 190	09-21-1956	3.05 Acres	Grant Deed: Hieatt to County of San Diego
Book 6952 Page 391	02-17-1958		Grant Deed: Carlsbad Properties to County of San Diego
Book 6952 Page 392	02-17-1958		Grant Deed: Carlsbad Properties to Cnty. of San Diego
Book 7054 Page 54	04-25-1958		Grant Deed: Heiatt to County of San Diego
Book 7138 Page 318	06-25-1958	11.05 Acres	Easement for County Hwy. (Vac Por 9-60/112)
Book 7133 Page 416	06-23-1958		Grant Deed: Kelly to County of San Diego
Book 7133 Page 419	06-23-1958		Grant Deed: Kelly to County of San Diego
Book 7133 Page 420	06-18-1958		Grant Deed: Kelly to County of San Diego
[illegible]	[illegible]	[illegible]	[illegible]
File/Page 74-083013	04-03-1974	NOT APPLICABLE	Palomar Airport Boundary Adjustment/Settlement
File/Page 74-083014	04-03-1974		
File/Page 74-083015	04-03-1974		
File/Page 77-012820	01-12-1977	237.44 Acres	Quitclaim Deed: Japatul Corp. to County of San Diego
File/Page 82-201566	06-30-1982	~26.28 Acres	Grant Deed to City of Carlsbad/County Retained Avigation Over Inner Horizontal Surface

<1> Acreages calculated based on legal descriptions provided, and are subject to field and records vrification.



Grant Deed to City of Carlsbad, Retained Avigation Easement Over Inner Horizontal Surface per Document Recorded June 30, 1982, F/P 82-201566 982-0001 A,B,C) 26.28 Acres

SEE MAP TO THE LEFT FOR EXTENTS OF EXISTING AIRPORT PROPERTY

PORTION OF LOT B
74-014190
PARCELS 1 AND 2

B. 7133 P. 318
B. 7133 P. 416
B. 7133 P. 419
B. 7133 P. 420

Ult. Avigation Easement (0.6 Acres)

Ult. Avigation Easement (3.4 Acres)

Ult. Avigation Easement (34.7 Acres)

B. 6952 P. 391
B. 6952 P. 392
B. 6268 P. 190
B. 7054 P. 54

LOT F

LOT A

Exist. Deed of Avigation Easement
Grantor: Mary E. Bressi
Parcels 76-0591-B and 76-0667-A
Recorded: 08-11-1988
File/Page No.: 87-452377
(11.7 Acres) <1>

LOT G
77-012820

74-083013
74-083014
74-083015

LOT G
RANCHO AGUA HEDIONDA
MAP 823

CORNER 5, LOT G
CORNER 16, LOT F
PARTITION MAP No. 823

Ult. Runway 5000' x 150'
Exist. Runway 4700' x 150'

Landfill Unit 1
Landfill Unit 2
Landfill Unit 3

Emergency Access Road

RUTHERFORD RD.
FARNSWORTH CT.
BALFOUR CT.
GEIGER CT.
LANDAU CT.
PASCAL CT.
LA PLACE CT.
EL CAMINO REAL
ASTON AVE.
DARWIN CT.
COLLEGE BLVD.
PALOMAR
ACCESS RD.
KELLOGG AVE.
DRYDEN PL.
VIA PALOMAR OAKS
CAMINO VIDA ROBLE
WRIGHT PL.
OWENS AVE.
TO INTERSTATE 5 PALOMAR AIRPORT RD.
TO INTERSTATE 5 PALOMAR AIRPORT ROAD

NORTH MAG

MAGNETIC VARIANCE-13°23'E (MARCH 1994)
RATE OF CHANGE 1.6' WEST

0 300 600 900
SCALE IN FEET

County of San Diego
Department of Public Works
Division of Airports

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McCLELLAN-PALOMAR AIRPORT

AIRPORT PROPERTY MAP

CARLSBAD, CALIFORNIA

PLANNED BY: Scott S. Gray
DETAILED BY: W.B. Holland
APPROVED BY: Jeanette V. Hoffman
November 15, 1996
SHEET 8 OF 8

Coffman Associates
Airport Consultants

Coffman Associates D:\GL\P.DWG 11-15-1996 11:21

Chapter Seven

FINANCIAL MANAGEMENT AND DEVELOPMENT PROGRAM

McCLELLAN-PALOMAR
A·I·R·P·O·R·T

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 McClellan-Palomar 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 nearly $16.0 million in improvements 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 7A, Summary of Total Costs**, provides the total cost associated with the 20-year planning period.

TABLE 7A
Summary of Total Costs
McClellan-Palomar Airport

Stage I (FY1996-FY2000)	$8,092,000
Stage II (FY2001-FY2005)	$6,452,000
Stage III (FY2006-FY2015)	$1,500,000
TOTAL DEVELOPMENT COST	**$16,044,000**

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 7B, 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 through FY2000. The projects in Stage I include the construction of a displaced runway threshold, taxiway extension, exit taxiways, terminal building, auto parking, access road, and tiedowns. The total development cost associated with Stage I was estimated at approximately $8.1 million.

Projects identified in the **Stage II** development program encompass the five year period from FY2001 through FY2005. Stage II development is generally associated with apron rehabilitation, T-hangar and Conventional hangar construction, lighted heliport and pavement preservation. The total development cost associated with Stage II was estimated at approximately $6.5 million.

Stage III contains the development items proposed between FY2006 and FY2015. The projects included in Stage III are generally associated with apron rehabilitation and pavement preservation. The total development cost associated with Stage III was estimated at approximately $1.5 million.

TABLE 7B
Capital Improvement Program
McClellan-Palomar Airport

	TOTAL	FAA	LOCAL	PRIVATE
STAGE I (FY1996-FY2000)				
FY1996				
1. Install Differential GPS Unit	$100,000	$0	$100,000	$0
2. Reconstruct Access Road (4,500 SY)	250,000	0	250,000	0
3. Construct Auto Parking (6,700 SY)	200,000	180,000	20,000	0
4. Erosion Control	300,000	270,000	30,000	0
5. Security Upgrade	90,000	81,000	9,000	0
6. Drainage Study	50,000	45,000	5,000	0
7. Environmental Assessment/EIR	50,000	45,000	5,000	0
FY1996 Subtotal	$1,040,000	$621,000	$419,000	$0
FY1997				
8. Airfield Signage	$200,000	$180,000	$20,000	$0
9. Runway Slurry Seal/Strip (79,000 SY)	350,000	315,000	35,000	0
10. Taxiway Slurry Seal/Strip (45,000 SY)	180,000	162,000	18,000	0
FY1997 Subtotal	$730,000	$657,000	$73,000	$0
FY1998				
11. Earthwork/Drainage	$1,000,000	$900,000	$100,000	$0
12. Runway Displaced Threshold (5,000 SY)	225,000	202,500	22,500	0
13. HIRL Extension (600 LF)	21,000	18,900	2,100	0
14. Construct Taxiway (5,000 SY)	225,000	202,500	22,500	0
15. MITL Extension (700 LF)	26,000	23,400	2,600	0
16. Install PAPIs	60,000	54,000	6,000	0
17. Construct Aircraft Washracks	150,000	135,000	15,000	0
FY1998 Subtotal	$1,707,000	$1,536,300	$170,700	$0

TABLE 7B (Continued)
Capital Improvement Program
McClellan-Palomar Airport

	TOTAL	FAA	LOCAL	PRIVATE
FY1999				
18. Construct Terminal Building (15,000 SF)	$2,300,000	$0	$0	$2,300,000
19. Construct Parking Structure (263 spaces)	1,315,000	0	1,315,000	0
20. Apron Slurry Seal/Strip (37,500 SY)	150,000	135,000	15,000	0
FY1999 Subtotal	$3,765,000	$135,000	$1,330,000	$2,300,000
FY2000				
21. Expand Auto Parking (5,000 SY)	$150,000	$135,000	$15,000	$0
22. Construct Access Road (9,000 SY)	200,000	180,000	20,000	0
23. Realign Taxiway Delta	500,000	450,000	50,000	0
FY2000 Subtotal	$850,000	$765,000	$85,000	$0
STAGE I TOTAL (FY1996-FY2000)	**$8,092,000**	**$3,714,300**	**$2,077,700**	**$2,300,000**
STAGE II (FY2001-FY2005)				
1. Install 54 Tiedowns	$27,000	$24,300	$2,700	$0
2. Construct Taxiway Exits (6,600 SY)	225,000	202,500	22,500	0
3. Apron Rehabilitation	500,000	450,000	50,000	0
4. Construct 80 T-hangars	2,400,000	0	0	2,400,000
5. Construct Conventional Hangar (30,000 SF)	3,000,000	0	0	3,000,000
6. Pave Perimeter Road	300,000	270,000	30,000	0
STAGE II TOTAL (FY2001-FY2005)	**$6,452,000**	**$946,800**	**$105,200**	**$5,400,000**
STAGE III TOTAL (FY2006-FY2015)				
1. Apron Rehabilitation	$1,000,000	$900,000	$100,000	$0
2. Pavement Preservation	500,000	0	500,000	0
STAGE III TOTAL (FY2006-FY2015)	**$1,500,000**	**$900,000**	**$600,000**	**$0**
TOTAL COSTS (FY1996-FY2015)	**$16,044,000**	**$5,561,100**	**$2,782,900**	**$7,700,000**

Note: Construction of the terminal building is assumed to be privately funded. Other funding sources, however, could include bank financing, bond financing or federal grant funding. If, in fact, the County were to utilize federal funding, approximately 70 percent of the total cost may be eligible.

AIRPORT DEVELOPMENT COST SUMMARY

The listing of projects under each stage in the development program, as outlined in Table 7B, 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 McClellan-Palomar 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, T-hangars and conventional hangars. FAA installed facilities and engineering projects (funded entirely by this federal agency) are listed and included in the total funding for each Stage.

In future years, the cost shown in Table 7B 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:

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

X = USCPI in any given year
Y = USCPI in 1995
Z = Change Ratio

Multiplying the change ratio (Z) by any 1995-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 McClellan-Palomar 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.

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 $2.105 billion in FY1994, $2.161 billion in FY1995, and $2.214 billion in FY1996. This three-year bill also contains a provision to increase the minimum entitlement allocation from $400,000 to $500,000, for primary commercial service airports.

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 eligible for both entitlement and 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.

Because airline passenger service is available at McClellan-Palomar Airport, entitlement funding from the FAA is also available. Through this mechanism, primary commercial service airports enplaning at least 10,000 passengers annually are guaranteed a minimum of $500,000 per year. For the first 50,000 enplanements, the airport receives $7.80 per enplanement. For the next 50,000 enplanements, the airport receives $5.20 per enplanement. The next 400,000 enplanements provide $2.60 per enplanement. For all enplanements over 500,000, the airport receives $0.65 per enplanement.

Passenger Facility Charges

The Aviation Safety and Capacity Expansion Act of 1990 contained a provision for airports to levy passenger facility charges (PFCs) for purposes of enhancing airport safety, capacity or security, reduce noise, or enhance air carrier competition.

Title 14 CFR Part 158 (May 1991), establishes the procedures that must be followed by airports choosing to levy PFCs. The regulations specify that PFCs may be imposed by public agencies controlling a commercial service airport with scheduled service and at least 2,500 annual passengers. Authorized agencies may impose a $1.00, $2.00, or $3.00 charge per enplaned passenger.

Prior approval is required from the U.S. Department of Transportation (DOT) before an airport is allowed to levy a PFC. Any AIP-eligible project, whether development or planning, is eligible for PFC funding. Noise Compatibility projects are also eligible whether or not they are in an approved F.A.R. Part 150 program. Gates and related areas for the movement of passengers and baggage are eligible as are on-airport ground access projects.

PFCs may be used only on approved projects for all or part of the allowable costs. They may be used as matching funds for AIP grants or to augment AIP-funded projects. PFCs can also be used for debt service and financing costs of bonds for eligible airport development. Before submitting a PFC application, the airport must give both notice and opportunity for consultation to airlines operating at the airport.

PFCs are to be treated similar to other airport improvement grants rather than as airport revenue, and will be administered by the FAA. Large and medium hub airports (those airport that enplane more than 0.25 percent of the annual U.S. domestic enplanements) will be required to forego up to 50 percent of their AIP passenger entitlements if they levy a PFC. Based on the forecast enplanements for McClellan-Palomar Airport and the U.S., it is not anticipated that the Airport will qualify as a medium hub airport during the planning period. McClellan-Palomar

Airport, therefore, will be eligible to retain all of its entitlement funds as well as any PFC revenue it receives.

Potential PFC and Entitlement Revenues

Table 7C, Potential Passenger Entitlement Funds and PFCs, outlines the maximum potential PFC and entitlement funding anticipated to accrue to the McClellan-Palomar Airport during the planning period. PFC revenues were based on the maximum of $3.00 per enplaned passenger. Only 75 percent of the enplaned passengers were assumed to be eligible for a PFC charge based on the current regulations.

TABLE 7C
Potential Passenger Entitlement Funds and PFCs
McClellan-Palomar Airport

Year	Forecast Calendar Year Enplanements	Entitlement Funding	PFC Revenues	Net Potential Entitlement and PFC
1996	21,800	$500,000	$49,050	$549,050
1997	24,600	500,000	55,350	555,350
1998	27,400	500,000	61,650	561,650
1999	30,200	500,000	67,950	567,950
2000	33,000	500,000	74,250	574,250
2001	35,400	500,000	79,650	579,650
2002	37,800	500,000	85,050	585,050
2003	40,200	500,000	90,450	590,450
2004	42,600	500,000	95,850	595,850
2005	45,000	500,000	101,250	601,250
2006	47,000	500,000	105,750	605,750
2007	49,000	500,000	110,250	610,250
2008	51,000	500,000	114,750	614,750
2009	53,000	500,000	119,250	619,250
2010	55,000	500,000	123,750	623,750
2011	57,000	500,000	128,250	628,250
2012	59,000	500,000	132,750	632,750
2013	61,000	500,000	137,250	637,250
2014	63,000	500,000	141,750	641,750
2015	65,000	500,000	146,250	646,250

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.

CALIFORNIA AID TO AIRPORTS

The California Aid to Airports Program (CAAP) provides three funding methods for airports in the State of California. The three methods include Annual Grants, AIP Matching Grants, and Acquisition and Development (A&D) Grants. The Annual Grant program provides general aviation airports with up to $10,000 per year for airport projects. These grants can be accrued for up to five years. Since McClellan-Palomar Airport is identified as a Primary Commercial Service Airport by the FAA, the airport is not eligible for these funds.

The AIP Matching Grants are available for general aviation and reliever status airports for matching the federal grants. Eligible airport projects can receive 90 percent funding from the federal AIP, 4.5 percent from the State, and 5.5 percent local share. Once again, however, McClellan-Palomar Airport is not eligible for the AIP Matching Grants from the State.

The A&D Grants are determined by the remaining State funds after the Annual Grants and AIP Matching Grants are distributed. This remaining monies can by used by general aviation, reliever and commercial service airports. The maximum amount that can be allocated to an airport in a single fiscal year is $500,000. These funds cannot be used as AIP matching funds for a federally funded project. The local match for a A&D Grant can vary from 10 percent the 50 percent. This percentage is set annually by the California Transportation Commission (CTC). Over the last ten years, however, the percentage has been ten percent. A&D Grant requests are adopted by the CTC every two years for fund programming. McClellan-Palomar Airport would be eligible for this funding, however, due the uncertainty of the funding availability these grants will not be used in the following funding analysis.

AIRPORT OPERATING REVENUE AND EXPENDITURES

The County has established an Airport Enterprise Fund accounting system for the operation of the County's seven airports. The FY1989 through FY1993 actual revenues and expenses associated with the operation of McClellan-Palomar Airport are presented in **Table 7D, Historic Revenues and Expenses.** The table includes the six major revenue accounts and five major expense categories.

TABLE 7D
Historic Revenues and Expenses
McClellan-Palomar Airport

	FY1989-90 ACTUAL	FY1990-91 ACTUAL	FY1991-92 ACTUAL	FY1992-93 ACTUAL	FY1993-94 ACTUAL
REVENUES					
Aviation	$592,071	$742,000	$703,371	$710,850	$654,260
Rental Car/Limo	28,137	27,469	53,363	136,966	40,440
Coast Waste	176,528	187,200	233,400	204,372	187,440
County Animal Shelter	56,460	56,460	56,460	56,460	56,460
Fuel	5,842	15,071	4,409	38,432	7,900
Olympic Hotel	211,019	217,581	542,171	136,378	154,370
TOTAL REVENUES	**$1,070,057**	**$1,245,781**	**$1,593,174**	**$1,283,458**	**$1,100,870**
EXPENSES					
Administration	$316,287	$357,360	$218,710	$352,832	$252,278
Maintenance	95,805	139,778	223,318	234,303	258,828
Operations	133,144	174,867	125,989	119,579	83,524
Lease Administration	53,438	104,957	124,547	120,312	186,159
Utilities	8,852	9,186	8,003	5,887	11,237
TOTAL EXPENSES	**$607,526**	**$786,148**	**$700,567**	**$832,913**	**$792,026**

Source: County of San Diego Administration

The establishment of more specific accounting classifications can assist in the financial analysis of trends and projections; however, these generalized categories will be used during this analysis. The following description of revenues and expenses will provide the County with general insight into the airport's future cash flow.

Airport Operation Revenues

Presently, the revenue related to the airport is derived from six basic lease sources: Aviation, Rental Car/Limo, Coast Waste, County Animal Shelter, Fuel and Olympic Hotel. A brief description of each revenue category is outlined in the following paragraphs.

Aviation

The Aviation category includes the fees collected from land leases on the airport. The fees collected from each of the aviation related activities (i.e., airlines, FBO's, tiedown areas, hangar areas, etc.) are included in this category. This category would also include the potential lease revenues for the new commercial terminal building site. This revenue category currently accounts for approximately 59.4 percent of the total airport revenue. It is expected that it will account for approximately 62.9 percent by the end of the planning period. This slight increase is generally due the inclusion of the new terminal lease revenue.

Rental Car/Limousine

Fees are charged to rental car agencies and limousine services which operate at the airport. This includes terminal building space rental, percentage of revenue and auto parking space leases. This revenue source is expected to increase over the planning period, due to the increase in airline passenger activity. Approximately 2.1 percent of the total airport revenue is expected to be comprised of this category by the end of the planning period.

Coast Waste

Portions of the airport property are leased to an independent solid waste collection company. This firm collects solid waste for various agencies and cities in the local area. Coast Waste appears to be utilizing more property than is indicated by the lease agreement, therefore, the County is currently revaluating the existing lease agreement with Coast Waste. The following cash flow analysis has indicated an average lease revenue increase throughout the planning period for this reason. It is expected that this category will account for approximately 16.6 percent by the end of the planning period.

County Animal Shelter

The County of San Diego operates a County Animal Shelter located on airport property. The flat-fee land lease revenue generated from the County Animal Shelter parcel are included in this category. The following cash flow has indicated an average lease revenue increase throughout the planning period. It is anticipated that this activity will continue through the planning period and will account for approximately 5.1 percent of the total airport revenue.

Fuel Flowage

Fuel flowage fees are one of the most common revenue sources for public airports. The fee is generally 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. It is anticipated that the FBO's will continue to sell fuel at the airport. Currently, a fuel flowage fee of $0.04 is being charged per gallon of fuel delivered to the FBO's. Utilizing the forecast operation level during the planning period, estimated fuel flowage revenues were projected. It is expected that 2.5 percent of the total airport revenue will relate to fuel flowage fees.

Olympic Hotel

A portion of the airport property is leased to the Olympic Hotel. Under the existing lease agreement, the Olympic Hotel pays the airport eight percent of gross sales. This lease agreement expires in 1995, however, no new terms have been established at this time. For this reason, the latest revenue amount of $155,000 will be used during the planning period. Approximately 10.7 percent of the total airport revenue is expected to be comprised of this category by the end of the planning period.

Airport Operating Expenses

The County currently accounts for expenses in the following five categories:

- Administration
- Maintenance
- Operation
- Lease Administration
- Utilities

In addition, a sixth category (Terminal Building Space) will need to be included during the planning period due to the potential development of a privately-constructed terminal building.

Administration

Administrative costs include the costs of one full-time secretary and associated benefits, as well as some office services and supplies. This expenses category is expected to comprise approximately 29.9 percent of the total airport expenses.

Maintenance

Expenses in the Maintenance category include the expenses of one full-time maintenance worker and associated benefits, occasional County maintenance staff, tools, equipment and supplies. Maintenance expenses are anticipated to be approximately 30.5 percent of the total airport expenses.

Operation

Operation costs include the airport manager, noise abatement officer and student worker salaries and associated benefits. This category is expected to account for 10.0 percent of the total airport expenses during the planning period.

Lease Administration

The Lease Administration expenses include one part-time real property agent, as well as support for other leasing projects. This expense category is anticipated to be approximately 24.6 percent of the total airport expenses.

Utilities

Utility costs include power and gas charges paid by the airport. This includes the utilities used by occupants of the terminal building, as well as lighting of the parking lot, security and airfield. With the exception of terminal building tenants, tenants leasing areas on the airport are responsible for their own utilities. Utility

costs were calculated based on historical utility costs provided by the County. Utility cost are expected to average approximately 1.1 percent of the total airport expenses. Utility cost would be expected to decrease in percentage of the total expenses, since the new terminal building will be privately owned and operated.

Terminal Building Space

The airport development plan identifies the construction of a larger commercial service terminal building in the present terminal building location. This building is anticipated to be constructed by a private developer, which would result in the County leasing office space within the new building. For this reason, a Terminal Building Space category has been added for cash flow analysis. The lease fee of $1.80 per square foot per month was used to calculate this potential expense through the planning period. This category is anticipated to comprise approximately 3.9 percent of the total airport expenses during the planning period.

CASH FLOW ANALYSIS

Table 7E, Cash Flow Analysis, illustrates the revenue/expense projections throughout the planning period. Some categories have increases identified which are averaged throughout the planning period. The cost of operating the airport, however, is not expected to exceed the anticipated revenues during the 20-year planning period. 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.

Funding Sources

Table 7F, Funding Sources Analysis, illustrates the potential sources of funds to finance the capital improvement program throughout the planning period. As indicated, approximately $1.5 million of capital improvement costs will have to come from federal discretionary grants, or local debt financing. The major funding sources depicted (Private, Entitlement Funds, and PFCs) are anticipated to exceed the capital improvement dollars after the year 1998.

TABLE 7E
Cash Flow Analysis - Stage I and Stage II
McClellan-Palomar Airport

OPERATING REVENUE	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Aviation	$656,000	$672,400	$689,210	$706,440	$796,101	$816,004	$836,404	$857,314	$878,747	$900,715
Rental Car/Limousine	$41,000	$42,025	$43,076	$44,153	$22,628	$23,194	$23,774	$24,368	$24,977	$25,602
Coast Waste	$188,000	$192,700	$197,517	$202,455	$207,517	$212,705	$218,022	$223,473	$229,060	$234,786
County Animal Shelter	$57,000	$58,425	$59,886	$61,383	$62,917	$64,490	$66,103	$67,755	$69,449	$71,185
Fuel Flowage	$31,500	$32,130	$32,760	$33,390	$34,020	$34,510	$34,999	$35,489	$35,978	$36,468
Olympic Hotel	$155,000	$155,000	$155,000	$155,000	$155,000	$155,000	$155,000	$155,000	$155,000	$155,000
TOTAL OPERATING REVENUE	$1,128,500	$1,152,680	$1,177,449	$1,202,821	$1,278,184	$1,305,902	$1,334,302	$1,363,399	$1,393,211	$1,423,757
OPERATING EXPENSES										
Administration	$255,000	$261,375	$267,909	$274,607	$281,472	$288,509	$295,722	$303,115	$310,693	$318,460
Maintenance	$260,000	$266,500	$273,163	$279,992	$286,991	$294,166	$301,520	$309,058	$316,785	$324,704
Operations	$85,000	$87,125	$89,303	$91,536	$93,824	$96,170	$98,574	$101,038	$103,564	$106,153
Lease Administration	$190,000	$194,750	$199,619	$204,609	$235,301	$241,183	$247,213	$253,393	$259,728	$266,221
Utilities	$11,300	$11,582	$11,872	$12,169	$9,978	$10,228	$10,484	$10,746	$11,014	$11,290
Terminal Space	$0	$0	$0	$0	$44,000	$45,100	$46,227	$47,383	$48,568	$49,782
TOTAL OPERATING EXPENSE	$801,300	$821,333	$841,866	$862,912	$907,567	$930,256	$953,512	$977,350	$1,001,784	$1,026,829
TOTAL AIRPORT INCOME	$327,200	$331,348	$335,583	$339,909	$370,617	$375,646	$380,789	$386,049	$391,427	$396,928

TABLE 7E (Continued)
Cash Flow Analysis - Stage III
McClellan-Palomar Airport

OPERATING REVENUE	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Aviation	$923,233	$946,314	$969,972	$994,221	$1,019,077	$1,044,554	$1,070,668	$1,097,434	$1,124,870	$1,152,992
Rental Car/Limousine	$26,242	$26,898	$27,570	$28,259	$28,966	$29,690	$30,432	$31,193	$31,973	$32,772
Coast Waste	$240,656	$246,672	$252,839	$259,160	$265,639	$272,280	$279,087	$286,064	$293,216	$300,546
County Animal Shelter	$72,965	$74,789	$76,659	$78,575	$80,540	$82,553	$84,617	$86,732	$88,901	$91,123
Fuel Flowage	$36,979	$37,490	$38,002	$38,513	$39,024	$39,492	$39,960	$40,428	$40,896	$41,364
Olympic Hotel	$155,000	$155,000	$155,000	$155,000	$155,000	$155,000	$155,000	$155,000	$155,000	$155,000
TOTAL OPERATING REVENUE	$1,455,075	$1,487,164	$1,520,042	$1,553,729	$1,588,245	$1,623,569	$1,659,764	$1,696,852	$1,734,856	$1,773,798
OPERATING EXPENSES										
Administration	$326,422	$334,582	$342,947	$351,520	$360,308	$369,316	$378,549	$388,013	$397,713	$407,656
Maintenance	$332,822	$341,143	$349,671	$358,413	$367,373	$376,558	$385,971	$395,621	$405,511	$415,649
Operations	$108,807	$111,527	$114,316	$117,173	$120,103	$123,105	$126,183	$129,338	$132,571	$135,885
Lease Administration	$272,877	$279,698	$286,691	$293,858	$301,205	$308,735	$316,453	$324,364	$332,474	$340,785
Utilities	$11,572	$11,861	$12,158	$12,462	$12,773	$13,093	$13,420	$13,755	$14,099	$14,452
Terminal Space	$51,027	$52,302	$53,610	$54,950	$56,324	$57,732	$59,175	$60,654	$62,171	$63,725
TOTAL OPERATING EXPENSE	$1,052,499	$1,078,812	$1,105,782	$1,133,427	$1,161,762	$1,190,806	$1,220,576	$1,251,091	$1,282,368	$1,314,427
TOTAL AIRPORT INCOME	$402,576	$408,352	$414,260	$420,302	$426,483	$432,763	$439,187	$445,761	$452,487	$459,370

TABLE 7F
Funding Sources Analysis
McClellan-Palomar Airport

		Funding Sources				
Fiscal Year	Capital Cost	Private	Entitlement	PFC	Airport Income	Funding Requirements[1]
1996	$1,040,000	$0	$500,000	$49,050	$327,200	$163,750
1997	730,000	0	500,000	55,350	331,347	0[2]
1998	1,707,000	0	500,000	61,650	335,583	809,767
1999	3,765,000	2,300,000	500,000	67,950	339,909	557,141
2000	850,000	0	500,000	74,250	370,617	0[2]
2001	1,290,400	1,080,000	500,000	79,650	375,646	0[2]
2002	1,290,400	1,080,000	500,000	85,050	380,789	0[2]
2003	1,290,400	1,080,000	500,000	90,450	386,049	0[2]
2004	1,290,400	1,080,000	500,000	95,850	391,427	0[2]
2005	1,290,400	1,080,000	500,000	101,250	396,928	0[2]
2006	150,000	0	500,000	105,750	402,576	0[2]
2007	150,000	0	500,000	110,250	408,352	0[2]
2008	150,000	0	500,000	114,750	414,260	0[2]
2009	150,000	0	500,000	119,250	420,302	0[2]
2010	150,000	0	500,000	123,750	426,483	0[2]
2011	150,000	0	500,000	128,250	432,763	0[2]
2012	150,000	0	500,000	132,750	439,187	0[2]
2013	150,000	0	500,000	137,250	445,761	0[2]
2014	150,000	0	500,000	141,750	452,487	0[2]
2015	150,000	0	500,000	146,250	459,370	0[2]
TOTAL	**$16,044,000**	**$7,700,000**	**$10,000,000**	**$2,020,500**	**$13,439,831**	**$1,530,658**

Notes: [1] These funds may be available from the FAA AIP discretionary funding and/or debt financing.
[2] The funding sources exceed development costs.

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.

CONTINUOUS PLANNING

The successful implementation of the McClellan-Palomar 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 1995 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 enplanements, total annual aircraft operations, and total amounts of fuel sales. Use of the Continuous Planning Chart, **Exhibit 7A**, and the Continuous Planning Graph, **Exhibit 7B**, 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 McClellan-Palomar Airport Master Plan.

SUMMARY AND CONCLUSIONS

As previously indicated, federal funding will be the primary funding source for development of McClellan-Palomar Airport and will be instrumental in the implementation of the plan. Airport revenue and private funding 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.

93MP12-7A-11/26/96

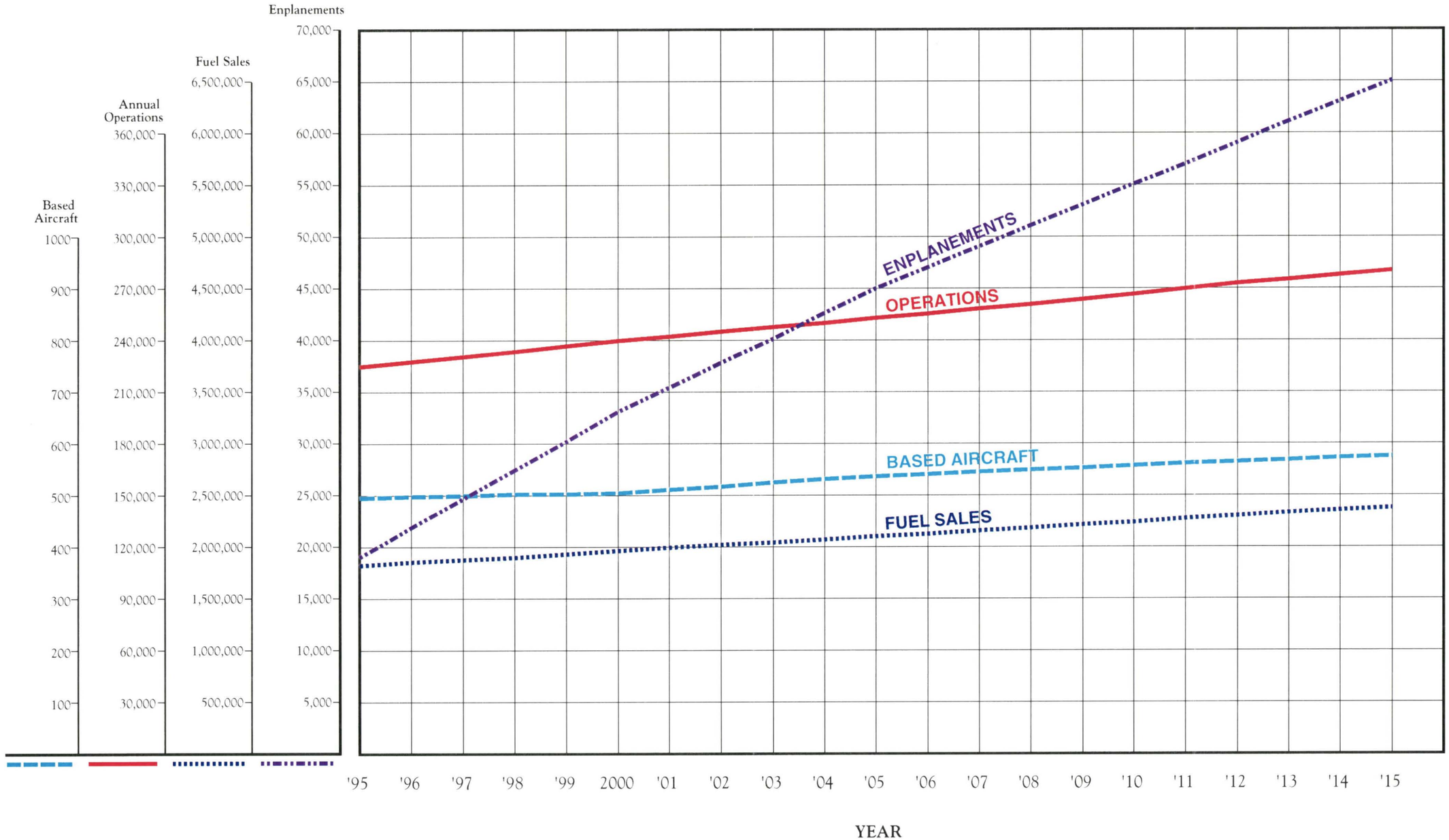
McCLELLAN-PALOMAR AIRPORT

	Based Aircraft		Annual Operations		Fuel Sales		Enplanements	
Year	Forecast	Actual	Forecast	Actual	Forecast	Actual	Forecast	Actual
1995	495		224,498		1,818,436		19,000	
1996	497		227,465		1,847,255		21,800	
1997	499		230,432		1,876,073		24,600	
1998	501		233,399		1,904,892		27,400	
1999	502		236,366		1,933,711		30,200	
2000	504		239,333		1,962,529		33,000	
2001	511		241,950		1,989,038		35,400	
2002	517		244,567		2,015,546		37,800	
2003	524		247,184		2,042,054		40,200	
2004	531		249,801		2,068,563		42,600	
2005	537		252,418		2,095,071		45,000	
2006	541		255,176		2,123,564		47,000	
2007	545		257,935		2,152,057		49,000	
2008	549		260,693		2,180,550		51,000	
2009	552		263,451		2,209,043		53,000	
2010	557		266,623		2,239,635		55,000	
2011	561		269,381		2,268,128		57,000	
2012	565		272,140		2,296,621		59,000	
2013	568		274,898		2,325,114		61,000	
2014	572		277,656		2,353,606		63,000	
2015	575		280,000		2,380,000		65,000	

McCLELLAN-PALOMAR AIRPORT

Exhibit 7A
CONTINUOUS PLANNING CHART

93MP12-7B-11/27/96



McCLELLAN-PALOMAR AIRPORT

Exhibit 7B
CONTINUOUS PLANNING GRAPH

STAGE I
FY 1996-FY 2000 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. 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	497		499		501		502		504	
Operations	227,465		230,432		233,399		236,366		239,333	
Fuel Sales (Gal)	1,847,255		1,876,073		1,904,892		1,933,711		1,962,529	
Enplanements	21,800		24,600		27,400		30,200		33,000	

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?

_____

_____

_____

Table 7G, Stage I (FY1996-2000) Airport Development Program, provides a listing of those development items recommended during Stage I of the planning period. Each item is numbered so that it can be cross referenced on **Exhibit 7C, Stage I (FY1996-2000) Airport Development Program.** The costs for every development includes 25 percent for engineering, contingency, and administration costs.

TABLE 7G Stage I (FY1996-2000) Airport Development Program McClellan-Palomar Airport				
STAGE I (FY1996-FY2000)				
FY1996				
1. Install Differential GPS Unit	$100,000	$0	$100,000	$0
2. Reconstruct Access Road (4,500 SY)	250,000	0	250,000	0
3. Construct Auto Parking (6,700 SY)	200,000	180,000	20,000	0
4. Erosion Control	300,000	270,000	30,000	0
5. Security Upgrade	90,000	81,000	9,000	0
6. Drainage Study	50,000	45,000	5,000	0
7. Environmental Assessment/EIR	50,000	45,000	5,000	0
FY1996 Subtotal	$1,040,000	$621,000	$419,000	$0
FY1997				
8. Airfield Signage	$200,000	$180,000	$20,000	$0
9. Runway Slurry Seal/Strip (79,000 SY)	350,000	315,000	35,000	0
10. Taxiway Slurry Seal/Strip (45,000 SY)	180,000	162,000	18,000	0
FY1997 Subtotal	$730,000	$657,000	$73,000	$0
FY1998				
11. Earthwork/Drainage	$1,000,000	$900,000	$100,000	$0
12. Runway Displaced Threshold (5,000 SY)	225,000	202,500	22,500	0
13. HIRL Extension (600 LF)	21,000	18,900	2,100	0
14. Construct Taxiway (5,000 SY)	225,000	202,500	22,500	0
15. MITL Extension (700 LF)	26,000	23,400	2,600	0
16. Install PAPIs	60,000	54,000	6,000	0
17. Construct Aircraft Washracks	150,000	135,000	15,000	0
FY1998 Subtotal	$1,707,000	$1,536,300	$170,700	$0
FY1999				
18. Construct Terminal Building (15,000 SF)	$2,300,000	$0	$0	$2,300,000
19. Construct Parking Structure (263 spaces)	1,315,000	0	1,315,000	0
20. Apron Slurry Seal/Strip (37,500 SY)	150,000	135,000	15,000	0
FY1999 Subtotal	$3,765,000	$135,000	$1,330,000	$2,300,000

TABLE 7G, continued
Stage I (FY1996-2000) Airport Development Program
McClellan-Palomar Airport

	TOTAL	FAA	LOCAL	PRIVATE
FY2000				
21. Expand Auto Parking (5,000 SY)	$150,000	$135,000	$15,000	$0
22. Construct Access Road (9,000 SY)	200,000	180,000	20,000	0
23. Realign Taxiway Delta	500,000	450,000	50,000	0
FY2000 Subtotal	$850,000	$765,000	$85,000	$0
STAGE I TOTAL (FY1996-FY2000)	**$8,092,000**	**$3,714,300**	**$2,077,700**	**$2,300,000**

Note: Construction of the terminal building is assumed to be privately funded. Other funding sources, however, could include bank financing, bond financing or federal grant funding. If, in fact, the County were to utilize federal funding, approximately 70 percent of the total cost may be eligible.

Inflation Adjustment: _____% X $8,092,000 = $ _____.

Plus or Minus Other Proposed Development:

Development Items	Total	FAA	Local	Private
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 or other funding during this period. The County of San Diego should have applications submitted early for the maximum funding possible in case additional funds become available.

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93MP12-7C-12/17/97

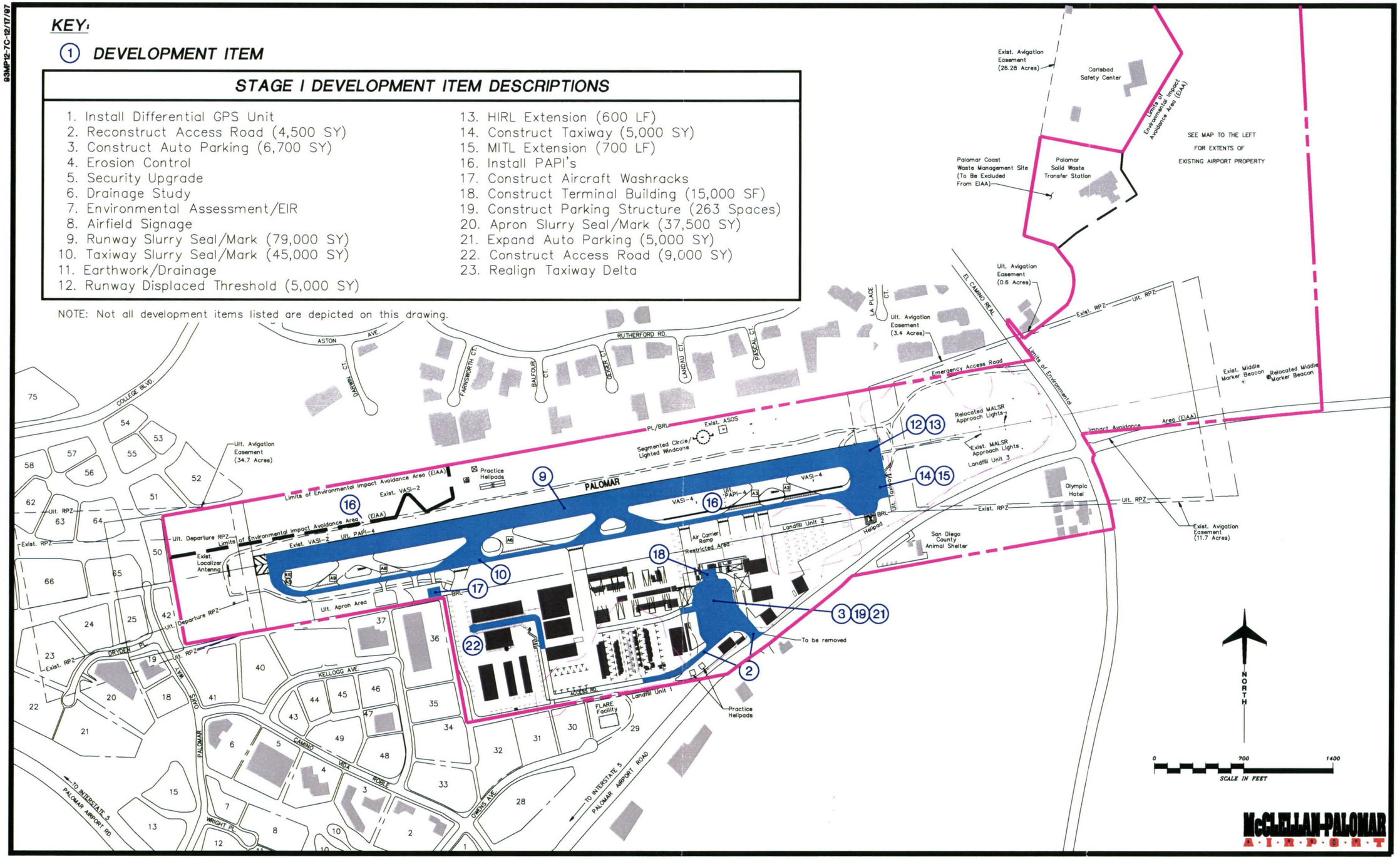
KEY:

(1) DEVELOPMENT ITEM

STAGE I DEVELOPMENT ITEM DESCRIPTIONS

1. Install Differential GPS Unit
2. Reconstruct Access Road (4,500 SY)
3. Construct Auto Parking (6,700 SY)
4. Erosion Control
5. Security Upgrade
6. Drainage Study
7. Environmental Assessment/EIR
8. Airfield Signage
9. Runway Slurry Seal/Mark (79,000 SY)
10. Taxiway Slurry Seal/Mark (45,000 SY)
11. Earthwork/Drainage
12. Runway Displaced Threshold (5,000 SY)
13. HIRL Extension (600 LF)
14. Construct Taxiway (5,000 SY)
15. MITL Extension (700 LF)
16. Install PAPI's
17. Construct Aircraft Washracks
18. Construct Terminal Building (15,000 SF)
19. Construct Parking Structure (263 Spaces)
20. Apron Slurry Seal/Mark (37,500 SY)
21. Expand Auto Parking (5,000 SY)
22. Construct Access Road (9,000 SY)
23. Realign Taxiway Delta

NOTE: Not all development items listed are depicted on this drawing.



McCLELLAN-PALOMAR AIRPORT

Exhibit 7C
STAGE I (FY1996-2000)
AIRPORT DEVELOPMENT PROGRAM

STAGE II
FY 2001-FY 2005 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. 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	511		517		524		531		537	
Operations	241,950		244,567		247,184		249,801		252,418	
Fuel Sales (Gal)	1,989,038		2,015,546		2,042,054		2,068,563		2,095,071	
Enplanements	35,400		37,800		40,200		42,600		45,000	

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?

_____

_____

_____

Table 7H, Stage II (FY2001-2005) Airport Development Program, provides a listing of those development items recommended during Stage I of the planning period. Each item is numbered so that it can be cross referenced on **Exhibit 7D, Stage II (FY2001-2005) Airport Development Program.** The costs for every development includes 25 percent for engineering, contingency, and administration costs.

TABLE 7H
Stage II (FY 2001-2005) Airport Development Program
McClellan-Palomar Airport

	TOTAL	FAA	LOCAL	PRIVATE
STAGE II (FY2001-FY2005)				
1. Install 54 Tiedowns	$27,000	$24,300	$2,700	$0
2. Construct Taxiway Exits (6,600 SY)	225,000	202,500	22,500	0
3. Apron Rehabilitation	500,000	450,000	50,000	0
4. Construct 80 T-hangars	2,400,000	0	0	2,400,000
5. Construct Conventional Hangar (30,000 SF)	3,000,000	0	0	3,000,000
6. Pave Perimeter Road	300,000	270,000	30,000	0
STAGE II TOTAL (FY2001-FY2005)	**$6,452,000**	**$946,800**	**$105,200**	**$5,400,000**

Note: Other funding sources could include bank financing, bond financing or federal grant funding. If the County were to utilize federal funding, approximately 70 percent of the total cost may be eligible.

Inflation Adjustment: _____% X $6,452,000 = $ _____.

Plus or Minus Other Proposed Development:

Development Items	Total	FAA	Local	Private
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 or other funding during this period. The County of San Diego should have applications submitted early for the maximum funding possible in case additional funds become available.

93MP12-7D-12/17/97

KEY:

① **DEVELOPMENT ITEM**

STAGE II DEVELOPMENT ITEM DESCRIPTIONS

1. Install 54 Tiedowns
2. Construct Taxiway exits (6,600 SY)
3. Apron Rehabilitation
4. Construct 80 T-hangars
5. Construct Conventional Hangar (30,000 SF)
6. Pave Perimeter Road

NOTE: Not all development items listed are depicted on this drawing.

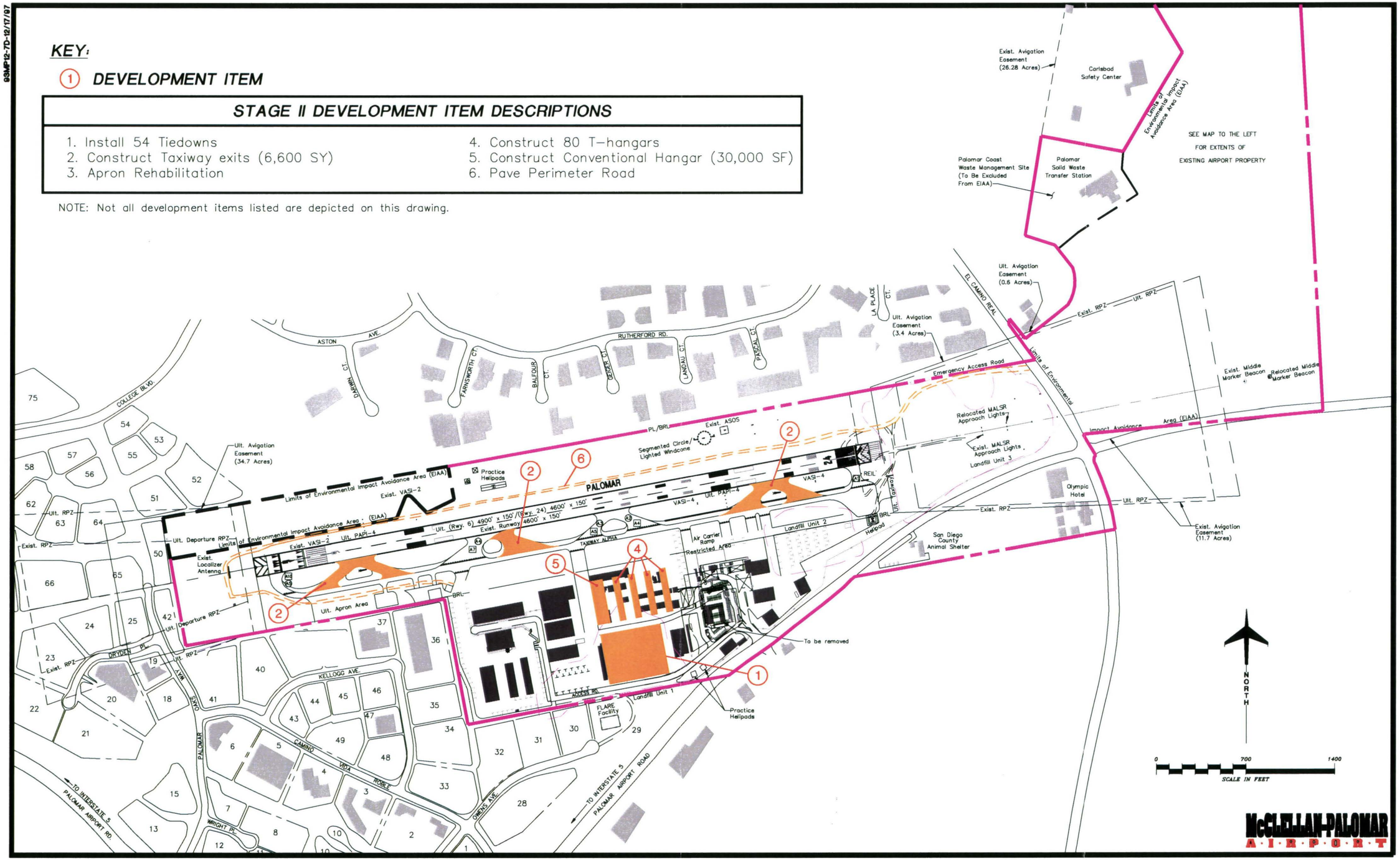


Exhibit 7D
STAGE II (FY2001-2005)
AIRPORT DEVELOPMENT PROGRAM

STAGE III
FY 2006-FY 2015 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. 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	541		545		549		552		557	
Operations	255,176		257,935		260,693		263,451		266,623	
Fuel Sales (Gal)	2,123,564		2,152,057		2,180,550		2,209,043		2,239,635	
Enplanements	47,000		49,000		51,000		53,000		55,000	

Item	FY2011		FY2012		FY2013		FY2014		FY2015	
	FCST	ACT	FCST	ACT	FCST	ACT	FCST	ACT	FCST	ACT
Based Aircraft	561		565		568		572		575	
Operations	269,381		272,140		274,898		277,656		280,000	
Fuel Sales (Gal)	2,268,128		2,296,621		2,325,114		2,353,606		2,380,000	
Enplanements	57,000		59,000		61,000		63,000		65,000	

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?

Table 7J, Stage III (FY2006-2015) Airport Development Program, provides a listing of those development items recommended during Stage I of the planning period. Each item is numbered so that it can be cross referenced on **Exhibit 7E, Stage III (FY2006-2015) Airport Development Program**. The costs for every development includes 25 percent for engineering, contingency, and administration costs.

TABLE 7J
Stage III (FY2006-2015) Airport Development Program
McClellan-Palomar Airport

	TOTAL	FAA	LOCAL	PRIVATE
STAGE III TOTAL (FY2006-FY2015)				
1. Apron Rehabilitation	$1,000,000	$900,000	$100,000	$0
2. Pavement Preservation	500,000	0	500,000	0
STAGE III TOTAL (FY2006-FY2015)	**$1,500,000**	**$900,000**	**$600,000**	**$0**

Note: Other funding sources could include bank financing, bond financing or federal grant funding. If the County were to utilize federal funding, approximately 70 percent of the total cost may be eligible.

Inflation Adjustment: _____% X $1,500,000 = $ _____.

Plus or Minus Other Proposed Development:

Development Items	Total	FAA	Local	Private
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 or other funding during this period. The County of San Diego should have applications submitted early for the maximum funding possible in case additional funds become available.

93MP12-7E-12/17/97

KEY:

① **DEVELOPMENT ITEM**

STAGE III DEVELOPMENT ITEM DESCRIPTIONS

1. Apron Rehabilitation
2. Pavement Preservation

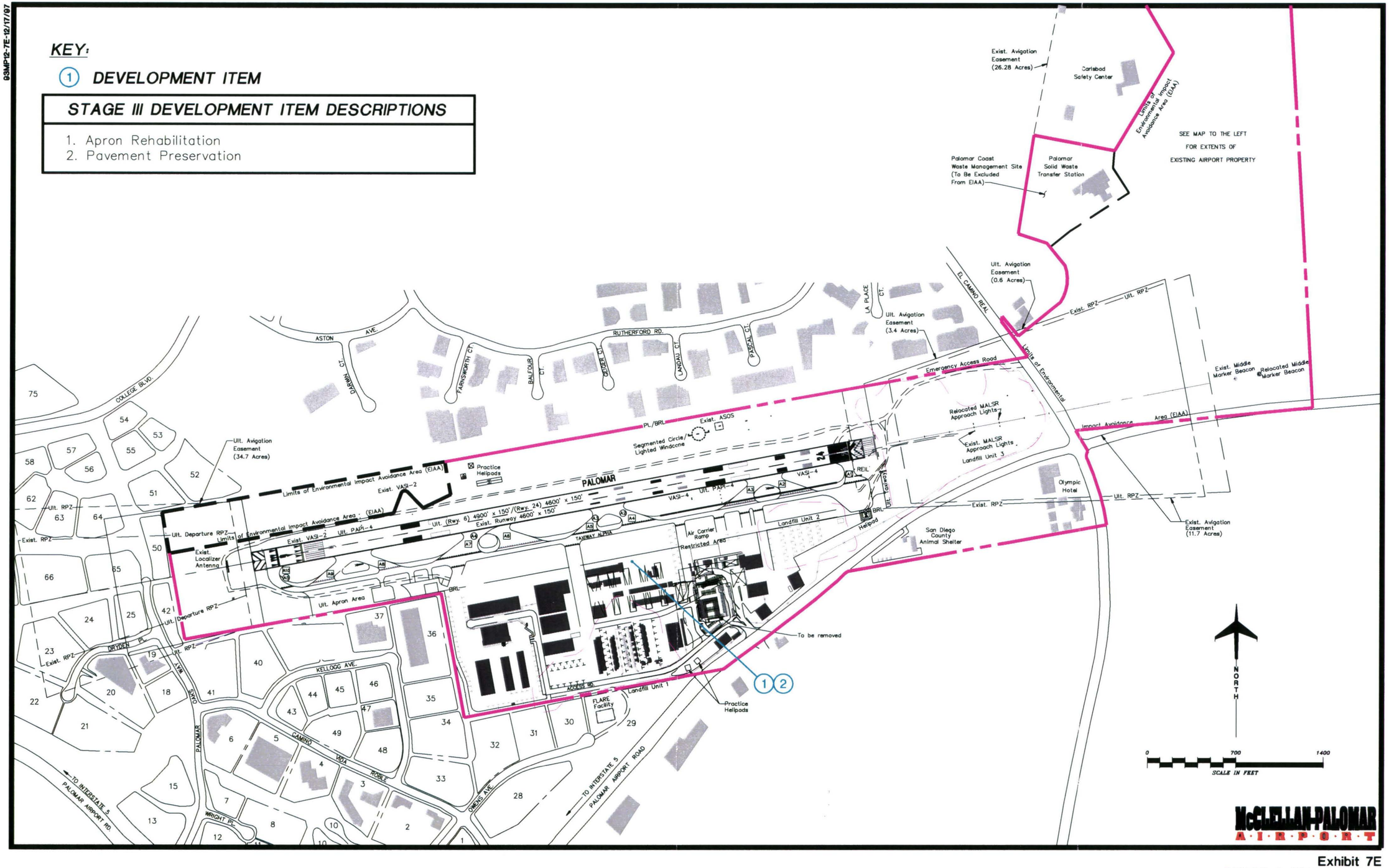


Exhibit 7E
STAGE III (FY2006-2015)
AIRPORT DEVELOPMENT PROGRAM

McCLELLAN-PALOMAR
A·I·R·P·O·R·T

Appendix A
GLOSSARY

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 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.

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.

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

ALS: approach lighting system

ARTCC: air route traffic control center

ATCT: airport traffic control tower

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

MM: middle marker

MSL: mean sea level

NAVAID: navigational aid

NDB: non-directional beacon

OM: outer marker

PAPI: precision approach path indicator

SEL: sound exposure level

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

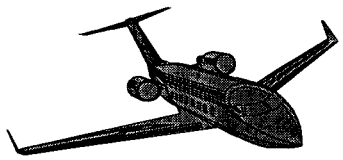
VOR: very high frequency omnidirectional range

VORTAC: (see VOR and TACAN)

Appendix B

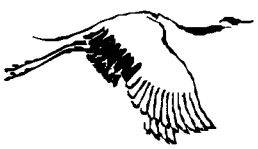
ECONOMIC BENEFIT ANALYSIS

McCLELLAN-PALOMAR
A·I·R·P·O·R·T



Economic Benefits

McClellan - Palomar Airport



Coffman Associates and Arizona State University

ECONOMIC BENEFIT STUDY

McClellan-Palomar Airport

OVERVIEW

This report presents the results of a study of the economic benefits of McClellan-Palomar Airport on its service area. (The airport service area includes the metropolitan area of Northern San Diego County and Southern California in general.)

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 McClellan-Palomar Airport.

Direct Benefits result from (a) **on-airport economic activity** of airlines, fixed base operators, all other airport tenants, and government agencies including the airport authority as well as (b) **off-airport 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 include the influence of multiplier effects.

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

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

Gross Revenues include total sales of business firms and budgets of government agencies, or the total flow of dollars from aviation-related activity.

Value added is a measure of new output created within the region. Value added results when input materials are processed by labor, under the direction of management, to produce a product for resale or a service.

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.

TOTAL BENEFITS: FY 1994

The economic benefits of McClellan-Palomar Airport in fiscal year 1993 - 1994 are shown below and in detail in Table 1.

The airport was the source of Gross Revenues of $108 million dollars, after incorporating all multiplier effects of second round spending.

Value Added, or net new production related to the presence of McClellan-Palomar Airport, was $88 million.

This spending and output supported 1,270 jobs within the service area of the airport, with a payroll of $33 million.

McClellan - Palomar Airport
Total Economic Benefits

- **1, 270 Jobs Supported**
- **$33 Million Total Payroll**
- **$88 Million Total Value Added**
- **$108 Million Gross Revenues**

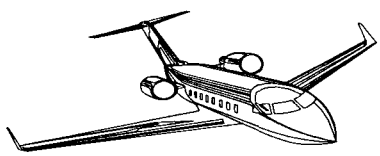


Table 1
McClellan-Palomar Airport
Total Economic Benefits: FY 1994

	Gross Revenues	Value Added	Payroll	Employees
Airport Operations	**$32,914,983**	**$27,404,956**	**$7,414,043**	**290**
Airlines				
Air Cargo				
Auto Rental				
FBO Services				
Food Services				
Flight Instruction				
Charter Services				
Medical Transport				
Aerial Photography				
Aircraft Maintenance				
Aircraft Sales & Rentals				
Government Agencies				
Airport Administration				
Capital Projects				
Air Visitors	**$17,088,350**	**$12,701,490**	**$6,618,548**	**320**
Lodging				
Food/Drink				
Retail Goods/Services				
Entertainment				
Transportation				
Travel Agents	**$11,047,955**	**$740,214**	**$296,085**	**13**
Direct Benefits	**$61,051,388**	**$40,846,660**	**$14,328,676**	**623**
Induced Benefits	**$47,573,428**	**$47,573,428**	**$19,029,371**	**647**
TOTAL BENEFITS	**$108,624,816**	**$88,420,088**	**$33,358,047**	**1,270**

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.

Airport Operations

The suppliers of aviation services located on McClellan-Palomar Airport include airlines; avionics firms; auto rental; fixed base operators providing fuel, maintenance and aircraft storage; flight training; charter services; food services; medical transport; aerial photography; all other tenants; airport construction; tower personnel; and the airport administration.

On-airport operations at McClellan-Palomar Airport created economic benefits of:

- **$32.9 Million Gross Revenues**
- **$27.4 Million Value Added**
- **$7.4 Million Payroll**
- **290 Jobs**

Gross revenues measure total sales by business on the airport and are equivalent to total spending by all customers for the fiscal year. Gross revenues from on-airport operations in FY 1994 were $32.9 million.

Value added is that part of gross revenues which results in new production of goods and services within the region. On-airport economic activity at McClellan-Palomar Airport created value added or new output of $27.4 million in FY 1994.

There were 290 full time equivalent on-airport workers, including those employed by private businesses and government agencies. These workers earned a payroll of $7.4 million during the fiscal year.

Air Visitors

Significant economic benefits of aviation result from spending by the users of aviation services, including both airline travelers and visitors that arrive in the region by general aviation aircraft. These travelers spent for lodging, food and drink, entertainment (such as golf and other attractions), retail and ground transportation.

Air travelers visiting McClellan-Palomar Airport created benefits of:

- **$17.1 Million Gross Revenues**
- **$12.7 Million Value Added**
- **$6.6 Million Payroll**
- **320 Jobs**

Spending by air travelers on lodging, food, drink, entertainment, retail goods and services, and various ground transportation services summed to $17.1 million of gross revenues for regional businesses in FY 1994.

For some sectors, such as lodging, all spending resulted in value added. Spending on services also creates an equal magnitude of value added. In other sectors, such as retail goods, a portion of revenues represents sales of goods brought into the service area for resale at a mark-up. Value added, measuring net new output created from spending by air travelers, was $12.7 million in FY 1994.

There were 320 workers employed serving air visitors, earning a payroll of $6.6 million.

In addition to visitors from other areas, the airport also served an estimated 16,247 local residents who purchased tickets for air travel. Air travel outlays by residents of the service area summed to $11 million in FY 1994, supporting 13 jobs in the local travel arrangements sector.

The combined Direct Benefits to the McClellan-Palomar Airport service area were:

- **$61.0 Million Gross Revenues**
- **$40.8 Million Value Added**
- **$14.3 Million Payroll**
- **623 Jobs**

These measures represent the amount of "first round" spending, value added (new output), payroll, and jobs in the McClellan-Palomar Airport service area that were due to the presence of the airport during FY 1994. This economic activity would not have taken place without McClellan-Palomar Airport, the aviation services provided there, and spending by users of these services. These figures include no multiplier effects.

Induced Benefits

Dollars spent in the McClellan-Palomar 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" or multiplier effects. Induced impacts occur, for example, when an on-airport firm buys supplies and services locally, pays wages to its workers, or undertakes capital expenditures. All of these outlays create local jobs, output, and income as the dollars circulate through the economy.

The Induced Benefits of McClellan-Palomar Airport in FY 1994 included:

- **$47.6 Million Value Added**
- **$19.0 Million Payroll**
- **647 Jobs**

Induced multiplier effects created value added of $47.6 million, and an additional 647 jobs in the service area with a payroll of $19.0 million. The average salary of these jobs was $29,366. 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, incorporating Direct and Induced Benefits were:

- **$108.6 Million Gross Revenues**
- **$88.4 Million Value Added**
- **$33.4 Million Payroll**
- **1,270 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. Therefore, total revenues can be computed as the sum of Direct and Indirect revenues plus the revenues created from spending on induced value added. Total revenues created by Direct and Induced spending summed to $108.6 million in FY 1994.

While total revenues are important as a base for tax collection, value added is more important economically, since it measures the value of new output.

The total value added benefit of McClellan-Palomar Airport was $88.4 million in FY 1994, supporting 1,270 jobs in the service area, with a payroll of $33.3 million.

The $88.4 million of total value added created by McClellan-Palomar 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 $33.3 million accounts for 38 percent of the total of $88.4 million value added created by the airport.

The ratio of Total Benefits to Direct Benefits as measured by value added was $88.4 million divided by $40.8 million = 2.17. This is the average multiplier for McClellan-Palomar Airport, implying that each dollar spent on airport operations or by air travelers created an additional $1.17 of new output before it left the service area.

Similarly, each on-airport job and each job in the economy serving air travelers created, on the average, one additional job in the service area.

TAX BENEFITS

Because of the high volume of economic activity due to the presence of McClellan-Palomar Airport, the facility is an important source of public revenues. (Tax revenues are in addition to various fees paid by airlines and other users of the airport.)

In FY 1994, an estimated $8.8 million of taxes revenues were collected as a result of activity related to McClellan-Palomar Airport, after accounting for all multiplier effects.

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

Table 2
McClellan-Palomar Airport
Tax Benefits From Airport Activity

Direct Taxes	
Local Taxes	$3,717,860
State Taxes	793,144
Subtotal	**$4,511,004**
Induced Taxes	
Local Taxes	$3,568,007
State Taxes	761,175
Subtotal	**$4,329,182**
Direct + Indirect	
Local Taxes	$7,285,868
State Taxes	$1,554,318
TOTAL TAXES	**$8,840,186**

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

Economic activity due to the presence of McClellan-Palomar Airport created direct tax revenues of $4.5 million in FY 1994. This figure included sales and excise taxes from airport tenants such as FBO's and airlines, 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 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 were $4.3 million in FY 1994.

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 $7.2 million, while direct plus induced state tax collections were an additional $1.6 million. McClellan-Palomar Airport was the source of total government revenues of $8.8 million in FY 1994.

(Note: in evaluating the economic benefits associated with the presence of McClellan-Palomar Airport, it should be recognized that tax revenues are a component of, and not additive to, gross revenues created by on-aviation and air visitor economic activity).

DAILY BENEFITS

Airports are available to serve the 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 an average day during FY 1994, McClellan-Palomar Airport recorded 600 aircraft operations, earning a ranking as the nation's busiest single runway airport.

During each day of the 1993-1994 fiscal year, McClellan-Palomar Airport generated $297,000 gross revenues within its service area (see figure). These revenues created daily value added (or new production) of $247,000.

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 McClellan-Palomar Airport supports 1,270 local jobs in the airport service area. These workers earned a daily payroll of more than $91,000 in FY 1994.

Daily tax revenues of $24,000 were generated by economic activity on and off the airport and within the local economy by successive multiplier effects of aviation related spending.

On an average day during the year, there were 700 overnight visitors in the area who had arrived at McClellan-Palomar Airport by airliner or general aviation aircraft. The average expenditures for these visitors on a given day during FY 1994 was $46,800.

McClellan - Palomar Airport

Daily Economic Benefits

- $297,000 Gross Revenues
- 1,270 Local Jobs Supported
- $91,000 Payroll Earned
- $12,000 Tax Revenues
- 700 Overnight Visitors
- $46,800 Visitor Spending

DETAIL ON BENEFITS

This section provides detail on the components of the benefits of McClellan-Palomar Airport, including the Direct Benefits of airport operations and visitor spending, and the Induced Benefits due to multiplier effects.

AIRPORT OPERATIONS

Table 4 illustrates the Direct Benefits from the annual operation of McClellan-Palomar Airport. Data on revenues, expenditures, payroll, and employment were obtained from a survey conducted on the airport during 1994.

There were 57 private employers on the airport and two government agencies during the FY 1994 study period. Employers included airlines, avionics sales and repair, fuel sales and full FBO services, rental and charter services, aircraft cleaning and maintenance, automobile rental, food services, flight instruction, pilot supplies, medical transport, hot air balloon sales, aerial photography, and various others.

On-airport operations created gross revenues of $32.9 million in FY 1994. The largest source was gross revenues of $30.9 million to private businesses on the airport. Government agencies had combined budgets of $1.7 million in FY 1994.

Capital outlays for on-airport improvements added an additional $356,957 to the revenue stream created on the airport. Among the improvements during FY 1994 were:

- noise monitoring system
- parking lot lighting
- rotating beacon replacement
- transient ramp reconstruction
- runway sweeper purchase
- ground water monitoring
- automated surface observation system (ASOS)

Value added due to the direct presence of on-airport operations was $27 million in FY 1994. The value added component of Table 4 represents the sum of (a) purchases for supplies and services plus (b) personnel outlays made by airport tenants. (For government agencies, value added is assumed equal to the proportion of the total budget spent locally.)

Expenditures by on-airport businesses and agencies 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, including airlines, airport businesses, and government agencies, spent a reported $20 million on supplies, materials, and services, according to a survey conducted in 1994.

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.

Table 4
McClellan-Palomar Airport

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

	Gross Revenues	Value Added	Payroll	Employees
Airport Businesses	**$30,858,000**	**$25,752,688**	**$6,351,421**	**268**
Airlines				
Air Cargo				
Auto Rental				
Aircraft Parts				
FBO Services				
Food Services				
Flight Instruction				
Charter Services				
Medical Transport				
Aerial Photography				
Aircraft Maintenance				
Aircraft Sales & Rentals				
Capital Projects	**$357,057**	**$232,087**	**$142,822**	**5**
Government Agencies	**$1,700,026**	**$1,420,181**	**$919,800**	**17**
Federal Aviation Admin.				
Airport Administration				
DIRECT BENEFITS	**$32,915,083**	**$27,404,956**	**$7,414,043**	**290**

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

Source: Survey of airport employers and tenants, 1994.

Private employers on the airport provided jobs for 268 persons during the FY 1994 study period while government agencies provided employment for 17 workers. Capital improvements required payroll outlays amounting to 5 worker-years, or 5 full time equivalent private sector jobs in construction and maintenance.

On-airport employment during the year was 290. Based on employment figures from the Carlsbad Chamber of Commerce, McClellan-Palomar Airport would rank as the 10th largest employer in the Carlsbad area if combined on-airport employers were counted as one single entity.

The total payroll for all airport-related employers was $7.4 million in FY 1994. Payroll of private businesses located on the airport was $25.7 million. Government agencies reported payrolls of $.9 million during the year.

The average salary for employees of private businesses on the airport (not including construction workers) was $23,788. The average salary for government workers was the largest for on-airport employers, at $54,105 primarily due to the influence of FAA employees.

Revenues From Based Aircraft

The airport serves both commercial airline traffic and general aviation aircraft. Much of the revenue created on the airport can be attributed to outlays by the owners of the 500 general aviation based aircraft.

According to a survey of aircraft owners conducted in 1994, the typical aircraft based at McClellan-Palomar Airport had a market value of $53,000. Owners reported expenditures averaging $7,384 per year on maintenance and operations. Using these figures, total revenues from maintenance and operations of based aircraft can be estimated as approximately $3.7 million in 1994. (Note that annual expenses for individual aircraft can vary greatly, depending on the size, technical specifications, and hours flown.)

AIRLINE VISITORS

In FY 1994 McClellan-Palomar Airport recorded 21,955 enplaning passengers. According to an analysis of the air traveler origin and destination data bank of the U. S. Department of Transportation, 26 percent of passengers boarding airliners at McClellan-Palomar Airport in FY 1994, or 5,708 persons, were visitors to the region.

Visitors to the Carlsbad area were surveyed in the airport terminal in 1994. A questionnaire was administered to gather information on travel party size, length of stay, and expenditures by visitors by category.

Table 5
McClellan-Palomar Airport
Airline Visitor Travel Patterns

Enplanements	21,955
Percent Visitors	26.0
Number of Visitors	5,708
Party Size	1.5
Days Stay	7.5
Visitor Days	42,810

Source: Airline Visitor Survey, 1994

Air visitors were approximately evenly divided between those traveling for business and persons traveling for recreation or personal reasons. The average travel party was 1.5 persons in size. The average length of stay for airline travelers was 7.5 days.

Airline travelers contributed to 42,810 visitors days for the airport service area during FY 1994. On an average day, there were 117 airline travelers in the area.

Airline travelers each spent an average of $70 per day while in the Carlsbad area. Lodging, at $24 per day, accounted for forty percent of the daily outlay. Average daily costs of food and drink were $18 (Table 6).

Table 6
McClellan-Palomar Airport
Airline Visitor Spending
Per Person Per Day

Category	Daily Spending
Lodging	$28
Food/Drink	18
Retail	9
Entertainment	7
Transportation	8
TOTAL	**$70**

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

Source: Airline visitor survey, 1994.

Table 7
McClellan-Palomar Airport
Airline Visitor Spending Per Trip

Category	Per Person Per Trip Spending	Percent
Lodging	$212	40
Food/Drink	134	25
Retail	67	13
Entertainment	52	10
Transportation	63	12
TOTAL	**$528**	**100**

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

Source: Airline visitor survey, 1994.

Airline visitors spent $528 per person per trip (Table 7). Lodging bills were the greatest single component of the trip outlays, averaging $212 per person. Spending for food and drink per person was $134.

Spending by airline visitors creafed jobs, output, income, and tax revenues within the service area. Multiplying 5,708 airline visitors by the average per trip outlays of $528 gives total airline visitor spending for FY 1994 in the Carlsbad area of $3,058,202.

The figures for spending per person per trip in Table 7 may be used to illustrate the economic value of visitor expenditures associated with the average airliner arriving at McClellan-Palomar Airport (see Table 8).

Table 8
McClellan-Palomar Airport
Economic Value of Visitor Spending Associated With Average Airliner

Avg. Passengers Per Plane	10
Percent Visitors	26
Number of Visitors Per Plane	2.6
Trip Expenditures per Person	$528
Value-One Arriving Airliner =	**$1,373**

The average arriving airliner in FY 1994 carried 10 passengers. Of these, 26 percent were visitors. The 2.6 visitors per aircraft spent $528 per person per trip. Total airline visitor spending was $1,373 of gross revenues injected into the local economy for each arriving airliner.

The first round spending by visitors recirculated within the local economy, where a portion was spent again, yielding a total benefit 2.17 times the initial impact. Thus, the total spending associated with the average arriving aircraft was $1,373 X 2.17 = $2,974 after accounting for all multiplier effects

GENERAL AVIATION VISITORS

McClellan-Palomar Airport attracts general aviation visitors from throughout the Western United States who come to the area for both business and personal travel.

In FY 1994, an estimated 111,705 visitors arrived by general aviation, staying an average of 1.9 days, contributing to 212,240 general aviation visitor days (Table 9).

Table 9
McClellan-Palomar Airport
General Aviation Visitor Days

Itinerant Operations	148,941
Transient Operations*	89,365
Transient Arrivals	44,682
Average Passengers	2.5
Average Stay (days)	1.9
Number of Visitors	111,705
GA Visitor Days	212,240

*Based on 60 percent "true transients"

Source: General Aviation Survey, 1994

There were 148,941 itinerant operations at McClellan-Palomar Airport in FY 1994. Based on tie down records and information from the Airport administration, it was estimated that 60 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 McClellan-Palomar Airport itinerant operations yields 89,365 true transient operations and 44,682 arriving travel parties in FY 1994.

General aviation travel parties were one person larger than airline travel parties (2.5 persons vs. 1.5 for airline visitors) and stayed a much shorter period of time (1.9 days for GA visitors vs. 7.5 days for airline visitors).

As shown in Table 10, general aviation travelers reported slightly smaller per-person daily expenditures ($66) than did airline travelers ($70).

Table 10
McClellan-Palomar Airport
Daily Spending Per GA Visitor

Category	Per Person Per Day
Lodging	$16
Food/Drink	17
Retail	21
Entertainment	7
Transportation	5
TOTAL	**$66**

General aviation visitors reported greater daily outlays per person for only one category, retail spending on goods and services, as compared to airline visitors. GA visitors spent $21 per person on retail, while airline visitors spent $9.

Because of slightly lower spending levels per person per day, combined with a much shorter length of stay, per trip outlays for general aviation visitors were significantly smaller ($126) than for airline visitors ($528).

At $40 per person per trip, retail spending was the greatest single category of expenditures for general aviation visitors to the Carlsbad area (Table 11).

Table 11
McClellan-Palomar Airport
General Aviation Visitor Spending
Per Person Per Trip

Category	Per Person Per Trip	Percent of Total
Lodging	$32	25%
Food/Drink	32	26
Retail	40	31
Entertainment	12	10
Transportation	10	8
TOTAL	**$126**	**100%**

The economic value of the average general aviation aircraft arriving at McClellan-Palomar Airport in FY 1994 was $314 (Table 12). This figure is obtained by multiplying together aircraft, trip expenditures for each spending category, and the number of persons on the average aircraft (2.5), and summing the categories.

Each arriving general aviation aircraft represents average lodging expenditures of $79, food outlays of $81, retail spending of $99, entertainment of $30, and transportation expenses of $25.

Although per person spending is lower than for airline visitors, the total number of general aviation visitor days is nearly five times larger (212,240 GA visitor days vs. 42,810 airline visitor days), creating a substantial economic benefit exceeding $14 million in FY 1994 (Table 12).

Table 12
McClellan-Palomar Airport

Expenditures By General Aviation Visitors

	Number Of Aircraft	Expenditures Per Aircraft	Gross Revenues
Lodging	44,682	$79	$3,529,878
Food and Drink	44,682	81	3,619,242
Retail	44,682	99	4,423,518
Entertainment	44,682	30	1,340,460
Transportation	44,682	25	1,117,050
TOTAL		**$314**	**$14,030,148**

COMBINED AIR VISITOR BENEFITS

Table 13 shows the economic benefits resulting from spending in the region by visitors arriving at McClellan-Palomar Airport in FY 1994. Gross revenue from visitor spending represents the sum of spending reported both by airline travelers and parties arriving by general aviation aircraft.

There were 255,050 combined visitor days from airline and general aviation travelers in FY 1994. Weighted average daily expenditures for the two types of travelers summed to $67.

Multiplying each category of spending by the number of visitor days yields the total outlays for lodging, food and drink, transportation, entertainment, and retail spending due to air visitors during the year. (Following the Caltrans methodology, retail and entertainment spending have been combined into a "miscellaneous" category in Table 13 to allow for compatibility with Caltrans internal impact coefficients.)

Gross revenues from air visitor spending on goods and services during FY 1994 summed to $17 million. This figure is important in computing economic benefits since sales and other taxes generated by visitors are based on total revenues.

Expenditures by spending category are adjusted by retail margin to provide an estimate of value added, where appropriate. Value added was $12.7 million from visitor spending in FY 1994. Value added is important in determining benefits that stay within the local service area.

Table 13
McClellan-Palomar Airport

Direct Economic Benefits from Air Visitors: Value Added
(Includes Airline and General Aviation)

	Air Traveler Visitor-Days	Average Daily Expenditures	Gross Revenues	Value Added
Hotel and Lodging	255,050	$18	$4,590,900	$4,590,900
Food and Beverage[1]	255,050	17	4,335,850	2,601,510
Transportation	255,050	6	1,530,300	1,530,300
Miscellaneous[1]	255,050	26	6,631,300	3,978,780
Total		**$67**	**$17,088,350**	**$12,701,490**

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 food is largely grown or produced elsewhere and brought to the Carlsbad area to be sold at markup. Similarly, retail products are typically manufactured in other areas and brought into the region as finished products for resale at a markup.

Net value added was equal to 75 percent of total revenues from air visitors. The largest component of value added was lodging, accounting for over one third of the total.

The daily impact of air visitor spending for the entire fiscal year was $46,000 of revenues and $35,000 of value added each day.

Table 13 may also be used to illustrate the distribution of the dollars from air visitor expenditures in the Carlsbad area over spending categories. Each one hundred dollars of visitor spending results in

- $27 spent on hotels and lodging
- $25 spent on food and beverage
- $9 spent on transportation
- $39 spent on retail goods and services including entertainment

Table 14
McClellan-Palomar Airport

Direct Economic Benefits from Air Visitors: Jobs and Payroll
(Includes Airline and General Aviation)

	Gross Revenues	Percent To Labor	Payroll	Average Salary	Number of Jobs
Hotel/Lodging	$4,590,900	40	$1,836,360	$18,965	97
Food/Beverage	4,335,850	35	1,517,548	13,570	112
Transportation	1,530,000	40	612,120	28,980	21
Miscellaneous	6,631,300	40	2,652,520	29,397	90
Total	**$17,088,350**		**$6,618,548**		**320**

Source: *State of California Economic Impact Model*, Caltrans

Table 14 presents the benefits of airline and general aviation visitor spending on employment and payroll in the McClellan-Palomar Airport service area.

Of the gross revenues of $17 million created by aviation visitors, $6.6 million (an average of 39 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 15 for each category of spending, an estimated 320 full-time-equivalent jobs in the McClellan-Palomar Airport service area were related to air visitor spending in FY 1994.

The food and beverage service sector (eating and drinking places) accounted for the greatest number of employees (112) with an average annual salary of $13,570 and a payroll of $1.5 million per year. Eating and drinking places accounted for one out of every three jobs supported directly by air visitor spending in the Carlsbad area.

Air visitor spending created 97 jobs in lodging establishments and an additional 90 jobs in the retail and entertainment sectors. The highest salary paid was in transportation, at $29,397 with 21 workers. The average salary for all jobs created by visitor spending was $20,682.

SUMMARY AND OUTLOOK

McClellan-Palomar Airport provides significant economic benefits for its service area. In FY 1994, airport Total Benefits exceeded $108 million in gross revenues for the local economy. Value added -- or net new output associated with the presence of the airport -- was $88.4 million, after accounting for all multiplier effects.

Aviation-related activity supported 1,270 jobs in the service area, with a regional payroll of $33.3 million.

Economic activity due to on-airport operations created Direct Benefits with gross revenues of $32.9 million and value added of $27.4 million. On-airport employers provided jobs for 290 workers in private businesses and government agencies, ranking the facility among the top 10 sources of employment in the Carlsbad area. The on-airport payroll was $7.4 million in FY 1994.

Visitors arriving by air contributed to 255,050 visitors days for the fiscal year. Spending by air travelers injected gross revenues of $17 million into the regional economy, creating 320 jobs in tourism and the hospitality industry.

Accounting for all spending associated with the airport and including multiplier effects, some $8.8 million in tax revenues were generated by the presence of the airport.

THE FUTURE

As passenger enplanements increase over time, airport operations will increase and the economic significance of the Airport will grow. Benefits were estimated for the years 2000 and 2005 by applying projected passenger growth rates to gross revenues, value added, payroll, and employment.

Benefits in 2000 were based on projected annual enplanements of 33,000. Estimates for 2005 were based on annual enplanements of 45,000. Benefit estimates are in constant 1995 dollars. The projections shown in Tables 15 and 16 are most useful if viewed as the benefits associated with demand for air travel and resulting levels of passenger activity, not necessarily as linked to a particular year.,

When demand for air travel reaches 33,000 annual passenger enplanements, the Total Benefits of McClellan-Palomar Airport will exceed $189 million in revenues and more than $154 million of value added to the regional economy (Table 15). This estimate includes $57 million in annual revenues from on-airport operations and $48 million in air visitor revenues, in 1995 dollars.

As enplanements reach 45,000, projected for the year 2005, there will be 686 persons employed on the airport and more than 3000 jobs supported in the total economy by aviation related activity. The Total Benefits of the airport will include gross revenues of $258 million and value added of $210 million.

Table 15
McClellan-Palomar Airport

Summary of Economic Benefits ($1995): 2000

Category	Gross Revenues	Value Added	Payroll	Employment
Airport Operations	$57,272,244	$47,684,623	$12,900,435	505
Air Visitors	48,957,171	23,388,565	12,031,461	579
Combined Benefits	**106,229,415**	**71,073,188**	**24,931,896**	**1,084**
Induced Benefits	**83,510,996**	**83,510,996**	**33,832,583**	**1,126**
TOTAL BENEFITS	**$189,740,411**	**$154,584,184**	**$58,764,479**	**2,210**

Note: Revenues, value added, payroll and employment for 2000 are based on activity and spending associated with annual enplanements of 33,000 passengers.

Table 16
McClellan-Palomar Airport

Summary of Economic Benefits ($1995): 2005

Category	Gross Revenues	Value Added	Payroll	Employees
Airport Operations	$77,890,252	$64,851,088	$17,544,591	686
Air Visitors	66,581,752	31,808,448	16,362,788	788
Combined Benefits	**114,472,004**	**96,659,536**	**33,907,379**	**1,474**
Induced Benefit	**113,574,955**	**113,574,955**	**46,012,313**	**1,531**
TOTAL BENEFITS	**$258,046,959**	**$210,234,491**	**$79,919,692**	**3,005**

Note: Revenues, value added, payroll and employment for 2005 are based on activity and spending associated with annual enplanements of 45,000 passengers.

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 airlines, private businesses serving general aviation, other airport tenants, and various government 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 international 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 or 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, material, 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 passenger activity; general aviation activity; visitor characteristics; visitor spending, destination, 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 administration of McClellan-Palomar Airport was extremely cooperative and effective in obtaining data directly or arranging for access to relevant data sources.

Much of 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.

Airlines, airport private businesses and tenants, and government agencies on the airport received a survey form designed for airport employers.

McClellan-Palomar Airport
Airport Benefit Surveys

- Airlines
- Aircraft Owners
- Airport Employers
- Air Carrier Visitors
- General Aviation Visitors

In order to obtain data from owners of visiting general aviation aircraft, tail numbers of itinerant travelers were collected from FAA and FBO records at the Airport. Mailing labels were developed by cross-referencing tail numbers and ownership information from the FAA general aviation aircraft data base. Surveys were mailed to owners of aircraft that had visited the area during the past year.

Visitors flying with commercial carriers were surveyed while they were waiting to board aircraft at the end of their stay in the Carlsbad area. Airline personnel assisted with the distribution and collection of forms from passengers.

Responses from the surveys were tabulated and analyzed following the general methodology recommended by the FAA as described 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 general 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.

Use of the Caltrans model allows comparison of benefit figures for airports within the state. It should be noted, however, that this study used an alternative approach to estimating the magnitude of GA visitor spending. The Caltrans guidelines recommend reducing GA visitor days by the proportion that "would have come to the Carlsbad area even if the airport was not available." This study assigned numeric values for answers to this question as follows: 1 = definitely yes; 2 = probably yes; 3 = unlikely; 4 = definitely not. Since the average value of the response was 3 = unlikely, the conclusion was drawn that the average GA visitor, making average expenditures, was unlikely to visit Carlsbad and undertake those expenditurers if the airport was not available. Therefore, average and total GA expenditures were not adjusted for those who would have visited the area with or without an airport available.

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APPENDIX

McCLELLAN - PALOMAR AIRPORT

ECONOMIC BENEFIT STUDY

SURVEY FORMS

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McCLELLAN-PALOMAR AIRPORT
ECONOMIC IMPACT STUDY

To All Airport Businesses:

We are in the midst of updating our 1989 Economic Study for Palomar Airport. In order to provide you with meaningful economic data about the airport, your cooperation is very much needed. The 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 at the address provided. Your cooperation is very much appreciated and please do not hesitate to contact me at 431-4646, should you have any questions.

Thank you.

Robert P. Olislagers
Airport Manager

1. Please describe your main business activity (airline, avionics, 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 total annual operating expenses $ _____

4. Please estimate annual payroll and benefits $ _____

5. Please estimate sales tax paid on gross revenues $ _____

6. 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	100	400	800	1	10	100
	(Thousand)		(Million)			

Thank You For Your Participation

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McClellan-Palomar Airport
Carlsbad Area Visitor Survey

Dear Visitor:

McClellan-Palomar Airport greatly appreciates your visit to the Carlsbad area. To help us provide the best service possible, we would like to know more about you and your stay in the local area. Completion of this **confidential and anonymous** questionnaire will assist us in providing high quality, cost effective aviation services. Please complete the form if you are a non-resident VISITOR to the area. We request only one completed form from each travel party.

Robert P. Olislagers
Airport Manager

1. Where is your residence? City _____ State _____

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

   a. Convention _____ b. Business _____ c. Personal _____ d. Pleasure/Recreation _____

3. How many people are in your travel party? Circle : 1 2 3 4 5 6 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. Please mark the area where you spent the most NIGHTS during your stay.

   _____ Carlsbad _____ Northern San Diego County
   _____ San Diego Area _____ Other Location

6. Please estimate how much your ENTIRE TRAVEL PARTY spent on each category during your TOTAL STAY on this 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. Please specify the FINAL DESTINATION for your airline trip today (Boston, San Jose, etc.)

   _____

8. If McClellan-Palomar Airport was not available, would you still have made this trip?

   Definitely Yes _____ Probably Yes _____ Unlikely _____ Definitely Not _____

Thank You For Your Participation

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McCLELLAN-PALOMAR AIRPORT
GENERAL AVIATION SURVEY

Dear Visitor:

McClellan-Palomar Airport is pleased to have you here today. To help us provide the best service possible for general aviation visitors, we need to know more about you and your opinions of our services. Completion of this **confidential** questionnaire will assist us in providing high quality, cost effective aviation services. If you have questions regarding this survey, please call McClellan-Palomar Airport at 602-431-4646.

Robert P. Olislagers
Airport Manager

1. Where is your residence? City _____ State _____

2. What was the main purpose of your most recent general aviation trip to the Carlsbad area?

   a. Convention _____ b. Business _____ c. Personal _____ d. Pleasure/Recreation ____

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. Please mark the area where you spent the most NIGHTS during your stay.

   Carlsbad ____ North San Diego County ____ San Diego Area _____ Other ____

6. Please estimate how much your ENTIRE TRAVEL PARTY spent on each category 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 McClellan-Palomar Airport was not available, would you still have visited this area?

Definitely Yes _____ Probably Yes _____ Unlikely _____ Definitely Not _____

Thank You For Your Participation

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CONFIDENTIAL MATERIAL

McCLELLAN-PALOMAR AIRPORT ECONOMIC IMPACT STUDY

AIRCRAFT OWNER SURVEY

This survey is being conducted to measure the impact of the McClellan-Palomar Airport on the local economy. Completion of this questionnaire will assist us in providing high quality, cost effective aviation services. ***Please return the survey in the enclosed postage paid envelope within ten days.*** The time you take to fill out this confidential survey is very much appreciated. If you have questions regarding this survey, please call McClellan-Palomar Airport at 431-4646.

1. How many aircraft do you have based at McClellan-Palomar Airport?

   _____

2. Please estimate the market value of your aircraft. _____

3. Please estimate your annual outlays for fuel, maintenance, insurance, storage, and other expenses associated with your aircraft.

   _____

4. Please estimate the annual number of (non- training) trips in your aircraft.

   Business _____ Personal _____

5. Please estimate average ROUND TRIP MILEAGE for a typical (non-training) trip.

   Business _____ Personal _____

6. What was the average number of persons on a typical trip?

   Business _____ Personal _____

Thank You For Your Participation

Appendix C
ENVIRONMENTAL ANALYSIS

McCLELLAN-PALOMAR
A·I·R·P·O·R·T

ENVIRONMENTAL ANALYSIS FORM

DATE: May 27, 1997

PROJECT NAME/NUMBER: McClellan-Palomar Airport Master Plan (UJ1595)

Instructions:

- The following questions must be answered either "Yes", "Yes, Unless Mitigated", "No", or "Not Applicable."

- A brief explanation is required for "Yes" and "Yes, Unless Mitigated" answers. Explanations may simply reference an extended initial study (e.g., Biology Report) as appropriate. A "No" answer should be explained where it is based on project-specific factors as well as general standards (e.g., the project will not result in any impacts to groundwater resources based on minimum lot size and well testing results).

- All answers must take into account the whole action involved, including off-site as well as on-site, cumulative as well as project-level, indirect as well as direct, and construction as well as operational impacts.

- "Yes" is appropriate if there is substantial evidence that an effect is significant. If there are one or more "Yes" entries when the determination is made, an EIR is required.

- "Yes, Unless Mitigated" applies where the incorporation of mitigation measures has reduced an effect from "Potentially Significant Adverse Environmental Impact" to a "Less Than Significant Adverse Environmental Impact". You must describe the mitigation measures, and briefly explain how they reduce the effect to a less than significant level (this can be done by the consultant within the "Extended Initial Study) (mitigation measures from Section XVI of this checklist, "Earlier Analyses" may be cross-referenced).

- Earlier analyses may be used where, pursuant to the tiering, program EIR, or other CEQA process, an effect has been adequately analyzed in an earlier EIR or negative declaration. CEQA Guidelines section 15063(c)(3)(D). Earlier analyses are discussed in Section XVI at the end of this checklist.

- Incorporate into the checklist references to information sources for potential impacts (e.g., general plans, zoning ordinances). Reference to a previously prepared or outside document should, where appropriate, include a reference as to where the statement is substantiated. A source list

should be attached, and other sources used or individuals contacted should be cited in the discussion.

I. LAND USE AND PLANNING.

a. Would the proposal potentially be in conflict with General Plan Designation or zoning (including the Community Plan and General Plan Elements)? No.

b. Would the proposal potentially be in conflict with applicable environmental plans or policies adopted by agencies with jurisdiction over the project? No.

c. Does the proposal have the potential to be incompatible with existing land uses in the vicinity? No.

d. Would the proposal have a potentially significant adverse impact on agricultural resources or operation (e.g., impacts to soils or farmlands, or impacts from incompatible land uses)? No.

e. Would the proposal have the potential to significantly disrupt or divide the physical arrangement of an established community? No.

f. Would the proposal use non-renewable resources in a wasteful and inefficient manner (e.g., residential development over a mineral resource)? No.

Brief Explanation of Land Use and Planning Answers (as necessary):

General Plan Designation and Zoning

McClellan-Palomar Airport (Airport) is a permitted use within the City of Carlsbad (CUP-172). The *Carlsbad General Plan* (approved by the City of Carlsbad City Council, September 1994) contains eight elements, four of which are applicable to McClellan-Palomar Airport. These include the Land Use Element, Circulation Element, Noise Element, and Public Safety Element.

The General Plan designates the developed portions of the Airport as "G", Governmental Facilities. This classification of land use designates areas currently being used for major governmental facilities by agencies such as the city, county, state, or federal government. The largest facility within this classification is the Airport.

According to the General Plan, the City of Carlsbad's special planning considerations for the Airport include maintaining land use compatibility between the Airport and surrounding land uses. The City's objectives are to

encourage the continued operation of the Airport as a general aviation airport, and to prohibit the expansion of the Airport unless approved by a majority vote of the Carlsbad electorate (Section 21.53.015, Carlsbad Municipal Code).

The Carlsbad General Plan also requires that all parcels of land located in the Airport Influence Area receive discretionary approval as follows: all parcels must process either a site development plan, planned industrial permit, or other discretionary permit. Unless otherwise approved by City Council, development proposals must be in compliance with state noise standards as specified in the Comprehensive Land Use Plan (CLUP) and meet Federal Aviation Administration (FAA) requirements with respect to building height, as well as the provision of obstruction lighting when appurtenances are permitted to penetrate the transitional surface. In addition, parcels of land must also consider County of San Diego (County) Airport Land Use Commission recommendations in the review of development proposals.

The General Plan also requires coordination with San Diego Association of Governments (SANDAG) and the FAA to project public health, safety, and welfare by ensuring the orderly operation of the Airport and the adoption of land use measures that minimize the public's exposure to excessive noise and safety hazards within areas around the airport.

The proposed Airport Master Plan (Master Plan) would be consistent with the *Carlsbad General Plan* in that it would maintain land use compatibility between the Airport and surrounding land uses; encourage the continued operation of the Airport as a general aviation airport; and not be an expansion. In addition, acquisition of one parcel located within the Runway Protection Zone (RPZ) that is not currently under the airport's jurisdiction would provide approach protection as would continuation of the current use under present ownership. The subject parcel is currently protected by a navigator easement. The County projects acquisition of this parcel in fee within the terms of the proposed Airport Master Plan.

The proposed Airport Master Plan would be consistent with the 1994 CLUP for the Airport. The Master Plan would be consistent with the Circulation Element, Public Safety Element, and Noise Element, as demonstrated in Sections VI, VIII, and IX of this Environmental Analysis Form.

Adopted Plans and Policies

1975 McClellan-Palomar Airport Master Plan

The last Master Plan completed for the Airport was conducted in 1975. The 1975 Airport Master Plan anticipated "unrestricted" demand to be approximately 500,000 annual operations by the year 1990, and identified a number of improvements that would be needed to meet this anticipated

growth. These improvements were examined in seven alternatives. The recommended alternative included construction of a parallel runway to a landing length of 3,600 feet to meet general utility runway criteria, extension of the existing runway 6R/24L to a landing length of 5,100 feet, construction of a parallel taxiway north of runway 6L/24R, and improvements to lighting and navigational approach aids.

Of the improvements recommended in the 1975 Airport Master Plan, the most significant were construction of the parallel runway and extension of the existing runway. Since the completion of the 1975 Airport Master Plan, certain management and local policies have been established that place controlling measures on the types of development and operational levels that can occur at the Airport. Most of the recommended development items identified in the 1975 Airport Master Plan have been completed to date. However, the runway extension and the parallel runway (County of San Diego 1995) were never realized.

The proposed Airport Master Plan recommends a 400-foot displaced threshold on Runway 6 (100 feet of which would be filled and graded, but not paved), as well as a 200-foot extension of the Runway 8 parallel taxiway on Runway 24. The runway extension and parallel runway recommended in the 1975 Airport Master Plan are not recommended in the present plan. The ultimate capacity of the Airport would be reduced, resulting in an inability to meet future demands. The proposed plan is not consistent with the Facilities portion of the 1975 Airport Master Plan.

Comprehensive Land Use Plan for McClellan-Palomar Airport

In 1970, the State of California enacted a law requiring the formation of an Airport Land Use Commission (ALUC) in each county containing a public airport. According to Chapter 21675 of the California Public Utility Code, it is the responsibility of the Commission to:

> "formulate a comprehensive land use plan that will provide for the orderly growth of each public airport and the area surrounding the airport within the jurisdiction of the Commission, and will safeguard the general welfare of the inhabitants within the vicinity of the airport and the public in general. The Commission plan shall be based on a long-range master plan or an airport layout plan, as determined by the Division of Aeronautics of the Department of Transportation, that reflects the anticipated growth of the airport during at least the next 20 years. In formulating a land use plan, the Commission may develop height restrictions on buildings, may specify use of land, and may determine building standards, including sound-proofing adjacent to airports, within the planning area."

The San Diego County Board of Supervisors, by unanimous vote on December 15, 1970, recommended that SANDAG be designated to assume the responsibilities of an Airport Land Use Commission. A similar resolution was passed and adopted by the Selection Committee of Mayors of the San Diego County Region on February 8, 1971.

SANDAG, as the Airport Land Use Commission for the San Diego Region, has approved and adopted the CLUP for the Airport.

In April 1994, SANDAG updated the 1986 CLUP for the Airport. The report was prepared to assist in ensuring the compatible land use development in the area surrounding the airport.

According to the 1994 CLUP, aircraft operations are projected to increase from 225,000 in 1992 to 290,000 annually by 1995. This increase in operations results in an average annual growth of approximately 8.8 percent (SANDAG 1994).

Aircraft Operations. There were 380 aircraft based at the Airport in 1992. Most of its 225,000 annual (1992) operations involved single-engine aircraft. Current operations produce noise impacts on the surrounding area. With the predicted increase in North County population and employment, aircraft operations are expected to increase. The area of noise impact will stay about the same with the increase in aircraft operations and change in aircraft mix (SANDAG 1994).

Airport Influence Area. The ALUC establishes an Airport Influence Area for each airport in the region. The Airport Influence Area encompasses those areas adjacent to airports which could be impacted by noise levels exceeding the California State Noise Standards, or where height restrictions would be needed to prevent obstructions to navigable airspace as outlined in FAA regulations. It represents the boundary of the ALUC's planning and review authority. The ALUC procedure ensures a regional overview to protect the Airport's operations, and to prevent the creation of new noise and safety problems (SANDAG 1994).

Runway Protection Zones. The Runway Protection Zones (RPZs) for the Airport are the land areas adjacent to the ends of the runway's primary surface, over which aircraft using the airport must pass for each operation, either arrival or departure. Because the RPZs lie mainly on the airport property, they are mostly protected from private development. The only land uses considered to be compatible with the restrictions required of the RPZs are:

1. Natural recreation areas or habitat and species preservation areas;
2. Public rights-of-way;
3. Agriculture, excepting livestock, and sand and gravel extraction; and,

4. Storage facilities, not including flammables, explosives, and corrosives, and low-intensity land uses characterized by a low number of employees and customers per square-foot of building area.

Areas immediately adjacent to the airport in every direction are zoned with a height limit of 35 feet. This height limit assures that new construction will not penetrate either the approach surfaces at the runway ends, or the transitional surfaces along the length of the runway. The 35-foot height limit allows an average height of 35 feet (e.g., an average of a sloping roof line could be 35 feet, although the roof line could slope from 25 to 45 feet). Additionally, penthouses, smokestacks, etc., can extend higher than 35 feet.

Flight Activity Zone. The Flight Activity Zone overlays private properties. It identifies land areas which should be held free of intensive development (for example, more than ten dwelling units per acre), including high-rise development and all uses which involve the assembly of large groups of people at high densities (SANDAG 1994).

The proposed Airport Master Plan would be consistent with the 1994 CLUP for the Airport.

County Board of Supervisors (Board) Policy F-44

The purpose of County Board Policy F-44 is to provide a policy establishing guidelines for the operation and development of the Airport. It is the goal of the County to insure that residential and commercial land uses around the Airport remain compatible with Airport operations. The first Board Action on Board Policy F-44 was on October 6, 1987. This policy was modified by the Board in 1991, and most recently in July 16, 1996. This policy is scheduled to "sunset" on December 31, 2002; however, Board Policy F-44 can be reviewed for continuance by the Board prior to this date.

"It is the policy of the Board of Supervisors that:

1. The role of McClellan-Palomar Airport shall be to provide air transportation for the residents of North San Diego County and to facilitate General Aviation activities while minimizing noise impacts on surrounding areas and communities.
2. Scheduled commuter airline operations are limited to aircraft having 10 to 60 seats and meeting the approach speed and wing span categories for McClellan-Palomar Airport in accordance with FAA regulations. Commuter airline aircraft shall meet the FAA Stage III noise criteria.
3. The airport will operate with one runway that simultaneously accommodates a 4,700-foot landing distance and a 5,000-foot

takeoff distance; the 300-foot difference, a displaced threshold on the runway's east end, will increase safety of the airport, while reducing noise levels.

4. The County will take a pro-active role working with local agencies and the FAA to protect the airspace around the airport from encroachment and to promote compatible off airport land development, and to insure the future safety and compatibility of the existing runway length.

5. The County will operate the airport in accordance with any adopted FAA Part 150 Noise Compatibility Program and in full compliance with any State or Federal mandated noise standards relating to the operation of a public airport. The program will recognize the Noise Element of the City of Carlsbad's General Plan and implement mitigation measures to minimize noise impacts.

6. The County will monitor aircraft noise and verify the Community Noise Equivalent Level (CNEL) noise contours within the airport influence area as described in the Palomar Airport Comprehensive Land Use Plan as well as monitor pilot compliance with any adopted FAA Part 150 Noise Abatement Program. The County will continue to monitor air traffic around the airport with a noise monitoring and flight tracking system and implement procedures to mitigate single event noises.

7. The Airport Manager will produce, distribute and promote a detailed noise abatement program for the airport. The program will contain specific flight information and a chart identifying noise sensitive areas. The noise abatement program will be updated annually and distributed to pilots. The Airport Manager will request pilot compliance with the program.

8. This policy recognizes SANDAG's Airport Land Use Plan."

The proposed Airport Master Plan includes a 400-foot displaced threshold (100 feet of which will be filled and graded, but not paved), which is required by the FAA, and which provides a larger safety margin than Board Policy F-44. The Master Plan would be consistent with Board Policy F-44.

Citywide Facilities and Improvements Plan and Local Facilities Management Plan

The purpose of the Citywide Facilities and Improvements Plan (Citywide Plan) is to implement the City of Carlsbad's General Plan and Zoning Ordinance by ensuring that development does not occur unless adequate public facilities and

services exist or will be provided concurrent with new development. The Citywide Plan is the first phase in the implementation process of the City's Growth Management Ordinance, which was adopted by Ordinance No. 9810 on July 1, 1986 by the Carlsbad City Council. In addition to the Citywide Plan, a Local Facilities Management Plan was prepared for each of the 25 local zones into which the City has been divided. When an individual development project is considered, a public facilities adequacy analysis is provided to ensure that the project is consistent with both the Citywide and Local Zone Plans (City of Carlsbad 1990). The Airport is located within Zone 5 of the City of Carlsbad's Local Facilities Management Plan. The present Airport Master Plan would be consistent with this plan. A public facilities adequacy analysis shall be provided prior to the construction of the passenger terminal.

City of Carlsbad Conditional Use Permit

The Planning Commission of the City of Carlsbad approved the Conditional Use Permit (CUP-172) to operate the existing Airport facility on September 24, 1980. The site plan, land uses, and conditions of approval for the Airport are set forth in CUP-172.

The following uses are permitted by CUP-172, without the need for additional discretionary review (City of Carlsbad 1980):

> "Airport structures and facilities that are necessary to the operation of the airport and to the control of air traffic in relation thereto, include, but are not limited to, the following:
>
> (1) Taxiways and parking aprons, including lighting.
>
> (2) Aircraft hangars, tie-down areas, and maintenance buildings.
>
> (3) Air traffic control towers and facilities.
>
> (4) Navigational aid equipment and structures.
>
> (5) Airport administration buildings, which may also include airport passenger terminal facilities.
>
> (6) Airport passenger terminal buildings and airtels, and facilities which may include as uses incidental thereto, consumer service establishments, including automobile rentals, retail shops normally operated for the convenience of the users of terminal facilities.
>
> (7) Heliports.
>
> (8) Aviation fuel farms.
>
> (9) Automobile parking lots and structures.

(10) Buildings for housing operations and equipment necessary to the maintenance, security, and safety of the Airport.

Commercial aviation activities as follows:

(1) Aviation flight and ground schools, including pilot and student equipment sales.

(2) Aircraft sales, including radio and navigational equipment, parts, supplies and accessory equipment.

(3) Aircraft hangar and tie-down rentals.

(4) Aircraft leasing, rental and charter.

(5) Airframe, engine, radio, navigational and accessory equipment repair, maintenance and modification.

(6) Aircraft ground support equipment repair, maintenance and modification.

(7) Aircraft cleaning services.

(8) Aircraft painting.

(9) Aviation fuel facilities.

(10) Aircraft and engine mechanic schools.

(11) Airlines, scheduled and non-scheduled.

(12) Airtaxi and air ambulance services.

(13) Air freight terminals and trans-shipment facilities.

(14) Aerial crop dusting and spraying enterprises.

(15) Aerial fire fighting.

(16) Aerial photography and surveying.

(17) Parachute rigging sales and service."

The following uses are allowed by CUP-172 if the City of Carlsbad Planning Commission determines they are consistent with the Airport facility (City of Carlsbad 1980):

"a. Incidental eating and drinking establishments.

b. Incidental commercial, professional office and/or industrial uses not specifically mentioned in structures and facilities or commercial activities, provided that such uses are permitted in and are consistent with the intent of the "M" Zone."

The following uses are allowed by CUP-172 if the City of Carlsbad Planning Director determines they are consistent with, and related to the Airport facility (City of Carlsbad 1980):

"a. Signs - Identification, directional and safety signs.

b. A single-family dwelling occupied exclusively by a caretaker or superintendent of such use and his family."

The Carlsbad Municipal Code regulates any expansion of the airport by way of the following ordinance:

"21.53.015 Voter authorization required for airport expansion.

a) The city council shall not approve any zone change, general plan amendment or any other legislative enactment necessary to authorize expansion of any airport in the city nor shall the city commence any action or spend any funds preparatory to or in anticipation of such approvals without having been first authorized to do so by a majority vote of the qualified electors of the city voting at an election for such proposes.

b) This section was proposed by initiative petition and adopted by the vote of the city council without submission to the voters and it shall not be repealed or amended except by a vote of the people."

The proposed Airport Master Plan would be in conformance with CUP-172. Portions of the RPZ would be acquired for approach protection only, could remain in agricultural production, and would not be developed; therefore, no zone change or general plan amendment would be required.

Because the proposed Airport Master Plan would be consistent with the General Plan, CUP-172, and Board Policy F-44, impacts to environmental plans and policies would not be significant.

Existing Land Uses in the Project Vicinity

According to the City of Carlsbad 1994 General Plan, the Airport is located in an area that is dominated by industrial uses. However, approximately eleven land use classifications occur within the airport influence area (Figure 3). These land uses include: Planned Industrial, Government facilities, Open Space; Unplanned Areas; Regional, Community, Neighborhood, Travel/Recreation, and Office & Related Commercial; and Low, Low-Medium, and Medium Density Residential. The closest residential development is approximately one mile south of the Airport (City of Carlsbad 1994a). Airport redeveloped in

accordance with the proposed Airport Master Plan would not be incompatible with surrounding land uses.

Agricultural Resources

The proposed Airport Master Plan calls for the acquisition of portions of the RPZ for approach protection only (i.e., generally described as 11.7 acres of land in the southeast corner of the intersection of El Camino Real and Palomar Airport Road). This land is currently used for agriculture, a use that would be consistent with the RPZ. Therefore, impacts to agricultural resources or operation would not be significant.

Community Disruption/Division

The proposed Airport Master Plan is the redevelopment of an existing airport, essentially within its existing footprint. Therefore, there would be no community disruption or division associated with the proposed Airport Master Plan.

Use of Non-Renewable Resources

Implementation of the proposed Airport Master Plan would require the use of construction materials, labor, and energy. The County bidding process encourages the efficient use of such materials. There are no nonrenewable resources located on the airport property (City of Carlsbad 1994b). Therefore, nonrenewable resources would not be used in a wasteful or inefficient manner.

II. POPULATION AND HOUSING.

a. Would the proposal potentially induce substantial growth in an area either directly or indirectly (e.g., extension of major roads, water, and/or sewer or place urban development significantly beyond the current limits of urban development)? No.

b. Would the proposal displace a potentially significant amount of existing housing, especially affordable housing? No.

Brief Explanation of Population and Housing Answers (as necessary):

While the Airport provides an important public service in the North County areas, the proposed Airport Master Plan would not meet the future, unconstrained demand for such airport services. The proposed Airport Master Plan substantially reduces the growth of the Airport as identified in the 1975 Airport Master Plan. Therefore, the proposed Airport Master Plan would not directly or indirectly induce growth.

There is no housing located on airport property. Therefore, none would be displaced.

III. GEOLOGIC ISSUES.

a. Would the proposal have the potential to significantly increase the exposure of people to hazards related to fault rupture (Alquist-Priolo Zone), seismic ground shaking, seismic ground failure (liquefaction), subsidence of land (from groundwater extraction), or landslides? No.

b. Would the proposal result in potentially significant increased erosion? No.

c. Would the proposal result in potentially significant unstable soil conditions from excavation, grading, or fill? No.

d. Does the proposal have soil characteristics that have the potential to substantially increase grading quantities (e.g., expansive soils)? No.

e. Would the proposal result in a potentially significant adverse effect to unique geologic features? No.

f. Would the proposal result in potentially significant loss of availability of a known significant mineral resource that would be of future value to the region and the residents of the State? No.

Brief Explanation of Geologic Problems Answers (as necessary):

There are no known active faults on the Airport property, although inactive faults are known to occur. The bedrock acceleration at the airport from a magnitude 6.9 earthquake on the Rose Canyon Fault would be approximately 0.66 times the acceleration of gravity. No surface rupture would be expected to occur and liquefaction, subsidence, and landslides would not be expected to occur onsite (City of Carlsbad 1994b).

Soils onsite are primarily of the Las Flores-Huerhuero Association. These soils are severely erodible (City of Carlsbad 1994b). The proposed Airport Master Plan would not result in substantially increased erosion, because the County would incorporate best management practices during construction activities, and during airport operations, to control erosion.

The proposed Airport Master Plan does not anticipate any substantial excavation, grading, or filling. Therefore, potentially unstable soil conditions would not be created.

The Las Flores-Huerhuero soil association are potentially expansive (City of Carlsbad 1994b). However, as the project site is currently developed, and only minor grading is required to implement the proposed Airport Master Plan, grading quantities would not be substantially increased.

There are no unique geologic features associated with the Airport, so none would be affected.

There are no known significant mineral resources or farmlands within the project area (City of Carlsbad 1994b), and the prime farmlands that occur at the northeast and southeast corners of Palomar Airport Road and El Camino Real (City of Carlsbad 1994b) could still be farmed under the proposed Airport Master Plan. Therefore, there would be no significant loss of such resources.

IV. WATER RESOURCES.

a. Would the proposal create a potentially significant adverse environmental impact to drainage patterns or the rate and amount of surface runoff? No.

b. Would the proposal expose people or property to flooding (e.g. development within a floodway or floodplain, create a potentially significant adverse impact to the configuration of a streambed, floodway, or floodplain)? No.

c. Would the proposal result in a potentially significant increase in local imported water supply demand? No.

d. Would the proposal have a potentially significant adverse impact on surface water quality (with emphasis on areas upstream of a public drinking water supply/reservoir)? No.

e. If the proposal is groundwater dependent, plans to utilize groundwater for non-potable purposes, or will obtain water from a groundwater dependent water district, does the project have a potentially significant adverse impacts on groundwater quantity? Not Applicable

f. Would the project have a potentially significant adverse impact on groundwater quality (e.g., nitrates; pesticides; herbicides; disposal, storage or use of hazardous materials)? No.

Brief Explanation of Water Resources Answers (as necessary):

Implementation of the proposed Airport Master Plan would result in the redevelopment of previously developed areas of the airport. No new major drainage facilities would be required, as existing drainage patterns and runoff quantities and velocities would not be affected.

The Airport is situated on a mesa top, and is not within a floodplain, floodway or streambed (City of Carlsbad 1994b, USGS 1975).

The provision of airport services requires the use of imported water. Implementation of the proposed Airport Master Plan would serve to meet a portion of the demand for airport services in north San Diego County. Unmet demand, with or without implementation of the proposed Airport Master Plan, would be met somewhere in the region, and so would not change the water supply needs associated with the provision of airport services. The proposed Airport Master Plan would be neither growth-inducing or growth-limiting. Therefore, there is not expected to be any change in the regional demand for imported water supply associated with the proposed Airport Master Plan.

There are no surface water resources that supply potable water downstream of the airport. Best management practices to control storm water pollutants would be implemented at the Airport, with or without implementation of the proposed Airport Master Plan. Therefore, impacts to surface water quality would not be significant.

The proposal is not groundwater-dependent.

There are no groundwater basins underlying or downgradient of the airport (City of Carlsbad, 1994b). All hazardous materials would be stored in accordance with applicable regulations. Therefore, the proposal would not have the potential to significantly affect groundwater quality.

V. AIR QUALITY.

a. Would the proposal have the potential to significantly contribute to the violation of any air quality standard or significantly contribute to an existing or projected air quality violation? No.

b. Would the proposal have the potential to significantly increase the exposure of sensitive receptors to any excessive levels of air pollutants? No.

c. Would the proposal potentially result in the emission of objectionable odors at a significant intensity over a significant area? No.

Brief Explanation of Air Quality Answers (as necessary)

The proposed project is fully within the scope of the Final Master EIR for the City of Carlsbad's General Plan Update (Master EIR). The contribution of McClellan-Palomar Airport to significant air quality affects associated with the General Plan Update was considered by the Carlsbad City Council in its Statement of Overriding Considerations Adopted with the Master EIR. Emissions of air pollutants would incrementally increase with the proposed Airport Master Plan, contributing to cumulatively-significant air quality effects. The Airport Master Plan update would not contribute additional significant air quality effects on the environment beyond those that were addressed in the Master EIR. Therefore, no new air quality effects would be associated with the proposed Airport Master Plan, and no additional environmental review is necessary.

See explanation above.

No new sources of odor would be introduced to the airport as a result of the proposed Airport Master Plan.

VI. TRANSPORTATION/CIRCULATION.

a. Would the proposal result in a potential increase in traffic congestion that is significant in relation to existing traffic loads and street capacities? No.

b. Would the proposal result in potentially significant adverse traffic safety impacts related to development of, or increased exposure to, identified traffic safety issues (e.g., sharp curves, limited sight distance, or dangerous intersections) or incompatible uses (e.g., farm equipment, heavy truck use)? No.

c. Would the proposal potentially result in inadequate emergency access? No.

d. Would the proposal potentially result in insufficient parking capacity on-site or off-site? No.

e. Would the proposal result in a potentially significant adverse increase in hazards or barriers for pedestrians or bicyclists? No.

Brief Explanation of Transportation/Circulation Answers (as necessary)

The proposed Airport Master Plan would increase airport-related average daily trips by 530, contributing to cumulatively significant traffic effects. The

proposed project is fully within the scope of the Final Master EIR for the City of Carlsbad's General Plan Update (Master EIR). The contribution of McClellan-Palomar Airport to significant transportation/circulation effects associated with the General Plan Update was considered by the Carlsbad City Council in its Statement of Overriding Considerations Adopted with the Master EIR. The Airport Master Plan update would not contribute additional significant traffic congestion or safety effects on the environment beyond those that were addressed in the Master EIR. Therefore, no new transportation/circulation effects would be associated with the proposed Airport Master Plan, and no additional environmental review is necessary.

Emergency access would continue to be provided to the airport during construction and operations of the airport under the proposed Airport Master Plan.

The requirements for public vehicle parking were determined using *Advisory Circular 150/5360-9, Planning and Design of Airport Terminal Facilities at Nonhub Locations.* In all, 330 new parking spaces would be required and provided at the airport. Therefore, impacts would not be significant.

The proposed Master Plan would improve internal circulation patterns for all modes of transportation, with no adverse effect to pedestrians or bicyclists.

VII. BIOLOGICAL RESOURCES.

a. Would the proposal result in potentially significant adverse impacts to an endangered, threatened or rare plant or animal species or their habitats (e.g., gnatcatchers, gabbro soils)? No.

b. Would the proposal result in potentially significant adverse impacts to wetland habitat (e.g., marsh, riparian, or vernal pools)? No.

c. Would the proposal result in potentially significant adverse impacts to wildlife dispersal or migration corridors? No.

Brief Explanation of Biological Resources Answers (as necessary):

The proposed Airport Master Plan proposes the establishment of two Environmental Impact Avoidance Areas (EIAAs) totaling 197.4 acres. The EIAAs are intended to include all sensitive biological resources occurring within the boundaries of the airport property. The EIAAs are known to contain the following vegetation communities: Diegan coastal sage scrub; maritime succulent scrub; San Diego mesa claypan vernal pool; southern

mixed chaparral; chamise chaparral; southern maritime chaparral; non-native grassland; and southern coast live oak riparian forest.

A site visit was made by BRG Consulting, Inc., on August 30, 1996, to characterize native plant communities occurring within the boundaries of McClellan-Palomar Airport property. Vegetation mapping prepared by the City of Carlsbad was verified during the site visit (City of Carlsbad GIS 1996).

The majority of the airport property west of El Camino Real has been graded. However, the west facing slope near Runway 6, at the west end of the airport, was found to contain Diegan coastal sage scrub (CSS). In addition, a small isolated patch of CSS was also found to occur immediately west of the practice helipads on the north side of the runway. Additional areas containing CSS were observed in the runway protection zone to the west of the airport. Numerous San Diego mesa claypan vernal pools were located within the CSS occurring west of the practice helipads, north of the runway (Pers. Comm., M. Webb 1996). Vegetation communities observed within the boundaries of the airport property to the east of El Camino Real and north of Palomar Airport Road, included maritime succulent scrub; southern mixed chaparral; chamise chaparral; southern maritime chaparral; non-native grassland; and southern coast live oak riparian forest.

The Diegan coastal sage scrub community is typically dominated by such species as coastal sagebrush (*Artemisia californica*), laurel sumac (*Malosma laurina*), black sage (*Salvia mellifera*), lemonade-berry (*Rhus integrifolia*) California encelia (*Encelia californica*), and flat-top buckwheat (*Eriogonum fasciculatum*).

Diegan coastal sage scrub has suffered cumulative losses in area over the last few decades. This community type is restricted to coastal areas of southern California and northern Baja California, particularly on south-and west-facing slopes. This habitat supports several sensitive plant and animal species to include the federally threatened coastal California gnatcatcher (*Polioptila californica*); the orange-throated whiptail (*Cnemidophorus hyperythrus*), a California species of special concern; and the former federal Category 2 San Diego horned lizard (*Phrynosoma coronatum blainvillei*). The sensitive coast barrel cactus (*Ferocactus viridescens*) may also be found in this habitat.

Maritime succulent scrub is a low scrub dominated by drought deciduous shrubs with a rich admixture of stem and leaf succulents (e.g., *Opuntia* sp., *Agave* sp., etc.). The ground is more or less bare between the shrubs. Growth and flowering are concentrated in the spring. This community is typically found on thin rocky or sandy soils, often on steep slopes of coastal headlands and bluffs (Holland 1986). This habitat is of limited distribution; and therefore, is considered sensitive by the County, and State and federal resource agencies.

San Diego mesa claypan vernal pools are typically located in small depressions in flat-topped marine terraces (Holland 1986). The pools are seasonally inundated and are capable of supporting sensitive species (e.g., *Pogogyne abramsii*, State and Federal Endangered Species) that are restricted to this habitat. Vernal pools are protected under the Clean Water Act as "Waters of the United States," and have been severely impacted by agriculture and development; therefore, vernal pools are considered sensitive by the County, and State and federal resource agencies.

Southern mixed chaparral is composed of broad-leaved sclerophyll shrubs 1.5 to 3.0 meters tall (Holland 1986). Plant species typically associated with southern mixed chaparral include chamise (*Adenostoma fasciculatum*), Ramona lilac (*Ceanothus tomentosus*), scrub oak (*Quercus berberidifolia*), and mission manzanita (*Xylococcus bicolor*). This community may be considered sensitive habitat if sensitive species are found to be associated with it, e.g., coast white lilac (*Ceanothus verrucosus*) and Del Mar manzanita (*Arctostaphylos glandulosa* ssp. *crassifolia*).

Chamise chaparral is overwhelmingly dominated by chamise. Associated species contribute little to the cover. This vegetation community is adapted to repeated fires by stump sprouting (Holland 1986).

Southern maritime chaparral is a low, fairly-open chaparral dominated by wart-stemmed ceanothus and thick-leaved Eastwood's manzanita. This habitat is restricted to Torrey Pines State Reserve and a few scattered nearby localities (Holland 1986). Thus, it is highly sensitive.

Non-native grassland consists of a dense to sparse cover of annual grasses. It is often associated with numerous species of showy-flowered, native annual forbs, especially in years of favorable rainfall.

Southern coast live oak riparian forest is an open to locally dense evergreen sclerophyllous riparian woodland dominated by coast live oak (*Quercus agrifolia*). This community occurs in bottomlands and outer floodplains along larger streams, on fine-grained, rich alluvium (Holland 1986).

Impacts to existing on-site biological resources are not anticipated from the implementation of the proposed Airport Master Plan. The plan would not impact existing native plant communities occurring within and surrounding the airport. Land acquisition areas within the runway protection zone are not proposed for development by the Airport Master Plan; therefore, existing native vegetation within those areas would not be impacted. The establishment of the EIAAs would ensure adequate protection for these areas. This level of protection was not provided under the current Airport Master Plan which was prepared in 1975.

VIII. HAZARDS.

a. Would the proposal present a significant risk of accidental explosion or release of hazardous substances (including, but not limited to oil, pesticides, chemicals or radiation)? No.

b. Would the proposal have the potential to significantly interfere with an emergency response plan or emergency evacuation plan? No.

c. Would the proposal have the potential to significantly increase the fire hazard in areas with flammable vegetation? No.

d. Would the proposal expose people to any other demonstrable potentially significant health or safety hazard not listed above? No.

Brief Explanation of Hazards Answers (as necessary):

All hazardous material use and storage onsite would be in accordance with all applicable federal, state, and local regulations. Such regulations are written to protect the public from accidental explosions and releases of hazardous substances. The Airport Master Plan specifically recognizes the hazards associated with landfill gas, and requires that all development within 1,000 feet of any landfill would need to be in compliance with the regulations regarding postclosure land use (Currently, Title 14, Division 7, Chapter 3, Article 7.8, Section 17796). Furthermore, the Airport Master Plan recommends that the building at 2128 Palomar Airport Road be demolished, and notes that any future, pre-demolition use of this building is subject to review by the Local Enforcement Agency of the County Department of Environmental Health Services. Explosive conditions related to landfill gas buildup have been measured in the basement of this building.

The proposed Airport Master Plan would not interfere with emergency response plans, and the improved airport could better service emergency response aircraft in the event of a emergency.

The proposed Airport Master Plan would redevelop existing developed areas of the airport, and there would be no potential to significantly increase the fire hazard.

Potentially significant health and safety hazards at airports can derive from failure to meet FAA design standards, and from the presence of "obstructions." These issues are addressed below.

Modifications To Standards

Due to recent changes in FAA's Design Guidelines, some of McClellan-Palomar Airport's existing facilities do not meet current FAA design standards. These are described below:

- Runway 24's existing Runway Safety Area (RSA) extends only 300 feet beyond the end of Runway 24, while standards call for 600 feet.

- Runway 24's existing Object Free Area (OFA) extends only 300 feet beyond the end of Runway 24, while standards call for 600 feet.

- The existing runway 6-24 centerline is located only 287.5 feet from the centerline of the parallel taxiway, while standards call for a 300-foot separation.

- The existing aircraft parking area is only 370 feet from the runway centerline, while standards call for 400 feet.

- The existing taxiway OFA is only 120 feet in width, while standards call for 131 feet.

Each of these design standards is intended to reduce the risk of damage to aircraft maneuvering at or around the airport. They affect only on-airport operations and none is expected to directly or indirectly affect general (off-airport) public safety. RSA's are intended to provide a clear and level area in the immediate vicinity of the airport to reduce damage to aircraft which undershoot, overshoot, or vere off the runway. OFA's are also intended to reduce damage to aircraft and other objects by limiting facilities in the immediate vicinity of the runway and taxiway. OFA's are generally kept clear except for objects used for air navigation or aircraft ground maneuvering purposes. Runway/taxiway separations and aircraft parking setbacks are intended to reduce the risk of damage to aircraft operating on the taxiway or located in the aircraft parking area should an aircraft vere off the runway while in the process of landing or departure.

The County of San Diego has requested the FAA to approve Modifications to Standards for each of these existing conditions. On May 14, 1997 the FAA conditionally approved the Airport Layout Plan. No further review or approval is required.

As part of the Airport Master Plan, a total of seven Modifications to Standards will be required. These are needed to change the Airport Reference Code (ARC) from B-II (existing) to D-III. The ARC indicates what types of aircraft currently utilize or are able to utilize an airport facility. Generally speaking, aircraft with

faster approach speeds require larger RSA's, and OFA's and aircraft with larger wingspans require greater separations between the runway and other airport facilities. In the case of McClellan-Palomar, aircraft with approach speeds classified as D and wingspans within Design Group III already utilize the airport facility (i.e., business jets and the Convair 580) on a regular basis; therefore, the change in the ARC is not to accommodate new aircraft, but is more of a formality.

The modifications which have been requested from the FAA are described below:

- Permit an RSA for Runway 24 to extend only 200 feet beyond the runway end where 1,000 feet is required. To reduce the distance required in the modification, the runway threshold will be displaced 300 feet and an additional 100 feet will be filled and graded. A modification to Standards would be required for the remaining 400 feet.

- Permit an OFA for Runway 24 of 700 feet where 1,000 feet is required.

- Permit a runway-taxiway separation of 287.5 feet where 400 feet is required.

- Permit an RSA width of 440 feet where 500 feet is required.

- Permit an OFA width of 740 feet where 800 feet is required.

- Permit a runway centerline to aircraft parking separation of 370 feet where 500 feet is required.

- Permit a taxiway OFA of 136 feet where 186 feet is required. This is to accommodate a proposed drainage project which would eliminate the drainage curb.

As with the existing facilities which require modifications, each of the facilities requiring modifications as part of the ultimate airport plan affect only on-airport operations. In point of fact, they are the same facilities which currently require modifications. On May 14, 1997 the FAA conditionally approved the Airport Layout Plan. No further review or approval is required.

Obstructions

FAR Part 77 determines the floors to various categories of airspace. (A "floor" refers to the lowest altitude at which aircraft using that airport would be expected to fly.) Generally speaking, the areas closer to the airport and in alignment with the runway have lower floors than those further away. Obstructions refer to those items which penetrate the airspace (i.e., their height

locates a portion of the item above the recommended airspace floor). Typical items which penetrate airspace include telephone/electrical poles and towers, bushes, trees, buildings, and terrain. The FAA determines obstructions through an Aeronautical Study.

Once an item is classified as an obstruction a determination is made by the FAA as to whether the item can be removed, modified, or lighted. Any of these actions would constitute resolution of the obstruction. If it is not possible to remove, modify or light the obstruction, the FAA would be expected to raise the instrument approach minimums associated with that airport facility or that runway. Essentially, this would notify pilots to fly at higher altitudes when using that airport.

At McClellan-Palomar Airport, forty (40) items have been identified as obstructions to FAR Part 77 airspace surfaces. Some of these items extend as little as three feet into the airspace and others as much as 231 feet. Of these 40 items, a determination has been made that five (5) items should be removed, one (1) item relocated, and sixteen (16) items lighted. Two (2) items were determined to be shielded by existing lighted items and required no further action. An FAA Aeronautical Study is necessary to determine the recommended disposition of the remaining items.

Under the Airport Master Plan, the ultimate airspace floors will drop by four (4) feet below the existing floors. This primarily affects those areas along the runway alignment. On May 14, 1997 the FAA conditionally approved the Airport Layout Plan. No further review or approval is necessary.

IX. NOISE.

a. Would the proposal expose people to potentially significant noise levels (i.e., in excess of the levels allowed by the County General Plan or Noise Ordinance)? No.

b. Would the proposal generate potentially significant adverse noise levels? (i.e., in excess of the levels allowed by the County General Plan or Noise Ordinance)? No.

Brief Explanation of Noise Answers (as necessary):

Noise levels associated with McClellan-Palomar Airport will be virtually unchanged with the proposed Airport Master Plan. The Year 2015 65 dB Community Noise Equivalent Level (CNEL) contours for the existing and proposed Airport Master Plans are shown on Figure 1. With the proposed Airport Master Plan, land uses to the west of the airport would experience a slight reduction in airport-related noise levels as compared to a no project alternative. These areas are designated "PI," Planned Industrial. Areas to the east of the airport, and north and south of the approach would experience slight

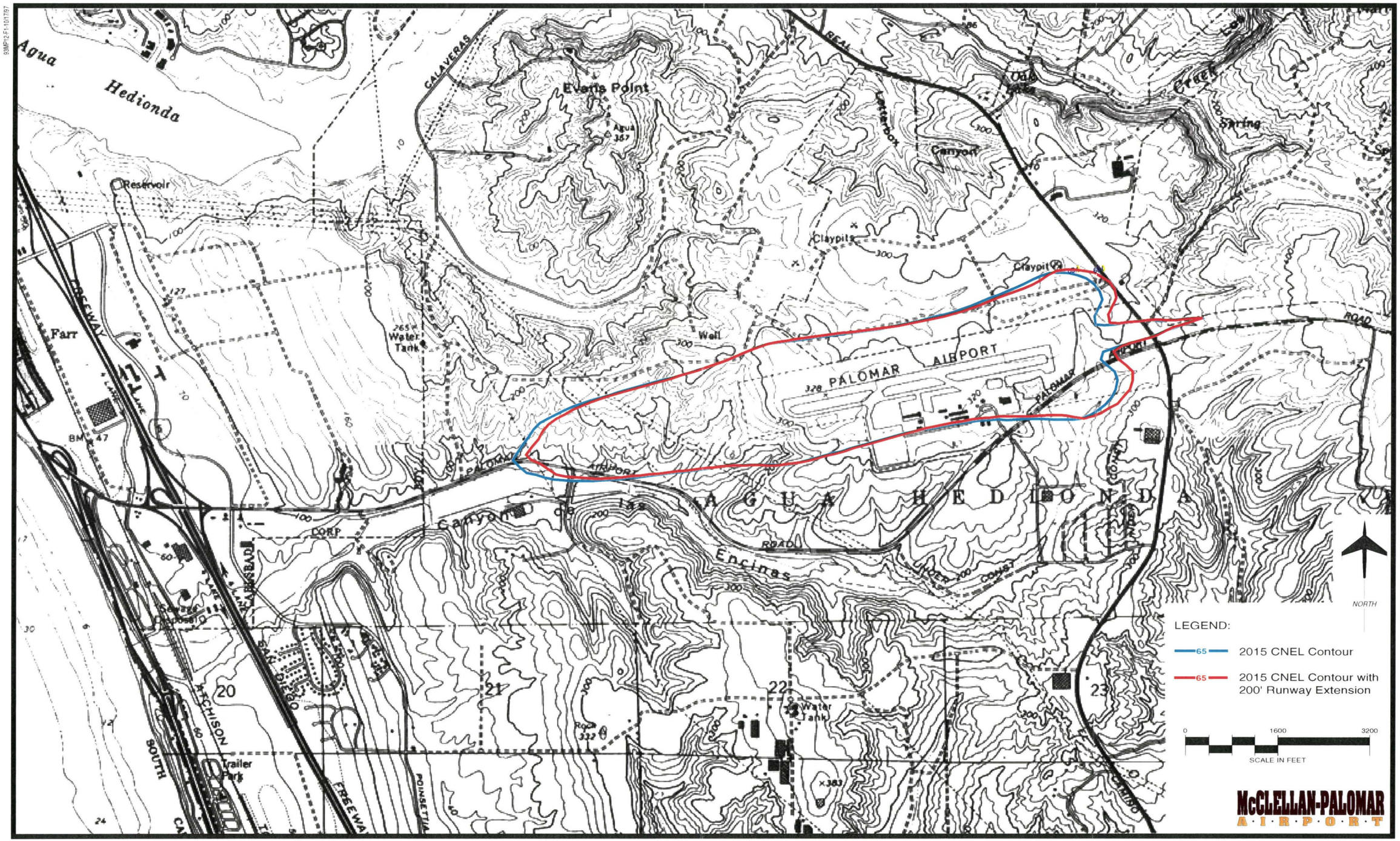

Figure 1
NOISE CONTOUR COMPARISON

increases in airport-related noise levels. These areas are designated "PI," "6," Governmental Facilities, and "T-R," Travel/Recreation Commercial; this incremental increase would not violate the City of Carlsbad Land Use Compatibility for Community Noise Environments (City of Carlsbad 1994b). Therefore, impacts would be below a level of significance.

X. PUBLIC SERVICES.

a. Would the proposal create potentially significant adverse effects on, or result in the need for new or significantly altered services or facilities (including a significantly increased maintenance burden) on fire or police protection, schools, parks, or other public services or facilities? No.

Brief Explanation of Public Services Answer (as necessary):

Fire Protection

The City of Carlsbad Fire Department provides fire services to the McClellan-Palomar Airport. Station #5 is located directly adjacent to the Airport and has an immediate response time in the event of any emergency. In the event of a large-scale emergency, Fire Stations No. 2, 3, and 4 can provide back-up service to Station No. 5 at McClellan-Palomar Airport (Burke and Watson, Pers. Comms. 1995).

Table 1 highlights the fire stations responsible for protecting each Local Facilities Management Zone within the airport influence area. Land uses in each of these zones are noted as either Residential or Non-Residential. Non-Residential uses are such uses as regional commercial, community commercial, neighborhood commercial, travel/recreation commercial, or office and related commercial. Management zones distinguished as Residential zones meet the adopted performance standard of not more than 1,500 dwelling units outside of a five minute road-response time from an existing fire station. The Growth Management Program does not identify a fire-service performance standard for Non-residential uses (City of Carlsbad 1987 and 1994a).

No new facilities would be necessary to maintain an acceptable level of fire service for McClellan-Palomar Airport. Because all future development in Management Zone 5 is within an acceptable response time of Fire Station No. 5, the airport will have adequate fire protection to buildout (Watson, Pers. Comm. 1995).

Police Protection

Police protection for Carlsbad residents and McClellan-Palomar Airport is provided by the Carlsbad Police Department. Carlsbad has adopted a standard of a maximum

TABLE 1

Fire Protection
Local Facilities Management Plan

Management Zone	Land Use [1]	Fire Stations Serving Airport Influence Area	Meets Performance Standard [2]
3	NR	1 & 4	NA
4	R	4	YES
5	NR	5	NA
8	R	3 & 5	YES
10	NA[3]	5 & 2[4]	NA
13	NR	4	NA
15	R	3 & 5	YES
16	NR	5	NA
17	NA[3]	5[4]	NA
18	R	2, 5 &6	YES
19	NR	2 & 4	NA
20	R	4	YES
21	R	2	YES

Notes:

(1) - The Growth Management Program does not identify a fire-service performance standard for nonresidential uses.
(2) - Performance Standard of not more than 1,500 dwelling units outside of a five minute response time.
(3) - No Local Facilities Management Plan available for zone.
(4) - Pers. Comm., Brian Watson

R - Residential zoning occurs within management zone.
NR - Non-Residential zoning occurs within management zone.
NA - Not Available

Source: City of Carlsbad 1994a

six-minute response time for police service on priority-one emergency calls. Police service (or the number of officers serving the City) is based upon actual workload measures including response times, travel times, type of service, number of calls for service, and the time of day that calls are received. It is not anticipated that the proposed Airport Master Plan update for McClellan-Palomar Airport would substantially impact police protection in Carlsbad (City of Carlsbad 1994a).

Schools, Parks, and Other Public Services

Implementation of the Airport Master Plan would not change the demand for schools, parks, or other public services, because it would not increase population or growth in the City. Therefore, impacts would be insignificant.

XI. UTILITIES AND SERVICES.

a. Would the proposal result in a need for potentially significant new systems or supplies, or substantial alterations to the following utilities:
   Power or natural gas;
   Communications systems;
   Water treatment or distribution facilities;
   Sewer or septic tanks;
   Storm water drainage;
   Solid waste disposal;
   Water supplies? No.

Brief Explanation of Utilities and Service Systems Answers (as necessary):

Power or natural gas

Existing power facilities would not be adversely affected, even though the proposed Airport Master Plan calls for the construction of High Intensity Runway Lighting (HIRL) and Medium Intensity Taxiway Lighting (MITL) on Runway 6-24, as well as the increases in building square footage and associated power usage. The existing facilities are capable of meeting the buildout needs of the City including the Airport (City of Carlsbad 1987).

Implementation of the proposed Airport Master Plan would not significantly change the demands, or level of service provided by the natural gas facilities. Existing facilities are adequate to provide service for the City to buildout (City of Carlsbad 1987).

Communications systems

Implementation of the proposed Airport Master Plan would not significantly increase demand to the existing communication systems. Current facilities are adequate to meet any new demands (City of Carlsbad 1987).

Water treatment or distribution facilities

The "Citywide Performance Standard" adopted by the City of Carlsbad is as follows. *"Line capacity to meet demand as determined by the appropriate water district must be provided concurrent with development, and a minimum 10 day average storage capacity must be provided prior to any development"* (City of Carlsbad 1987).

Water for the City of Carlsbad is supplied by three agencies: Carlsbad Municipal Water District, Vallecitos Water District, and the Olivenhain Municipal Water District. Water distribution for the Airport is provided entirely by the Carlsbad Municipal Water District. Adequate facilities are in place or currently planned to serve the existing and future needs of the airport (City of Carlsbad 1994b). Significant impacts to water distribution are not anticipated from the implementation of the proposed Airport Master Plan.

Because the implementation of the proposed Airport Master Plan would not substantially increase potable water usage, no significant adverse impacts to the existing water distribution system are anticipated.

Sewer or septic tanks

The performance standard for the City of Carlsbad requires that "*Sewer plant capacity is adequate for at least a five year period*" (City of Carlsbad 1987).

Wastewater treatment for the City of Carlsbad is provided by three separate and independent agencies. The majority of the City receives service from the City of Carlsbad Sewer District. The southern part of the City receives service from the Leucadia County Water District (LCWD), and the Vallecitos Water District provides sewer services to the eastern edge of the City. The service areas of the latter two agencies extend well to the south and east of the City's boundaries. For the projections and analysis, only that portion of each District's service area within the City of Carlsbad was considered. Wastewater treatment is provided primarily at the Encina Water Pollution Control Facility (WPCF) (City of Carlsbad 1993).

Ownership and wastewater treatment capacity of the Encina WPCF are shared on a percentage basis by six independent sewer districts. Currently, the Encina WPCF has capacity to treat 38 million gallons per day. Ultimately, this facility will be able to treat 45 million gallons per day.

As of 1995, the total flow of untreated water being processed by the Encina Water Treatment Plant was estimated to be 16 million gallons per day, well under plant capacity. The Encina WPCF is sized for the needs of its service area in the year 2010 (Hogan, Pers. Comm. 1995).

The existing wastewater Treatment facilities are adequate to meet the current, and projected service needs for the City, including the Airport, until buildout.

Storm water drainage

The "Citywide Performance Standard" adopted by the City of Carlsbad is as follows. *"Drainage facilities must be provided as required by the City concurrent with development"* (City of Carlsbad 1987). The standard for drainage distinguishes it from all of the other public facilities and improvements, because it is more accurately assessed as the specific development plans for individual projects are finalized. Therefore, the standard has been written to allow the City to require the appropriate development of drainage facilities as these plans are finalized and approved (City of Carlsbad 1990).

City of Carlsbad Local Facilities Management Plan Zone 5 is divided into three separate drainage basins, two of which drain to the Agua Hedionda Lagoon. The third and most predominant basin drains down the Encinas Canyon and empties directly into the Pacific Ocean (City of Carlsbad 1987).

The proposed Airport Master Plan would not alter existing drainage courses or substantially increase storm water runoff. Therefore, no impacts to drainage would occur.

Solid waste disposal

Solid waste generated at the airport is currently hauled by a private waste hauler for disposal at a permitted landfill. It is anticipated that future solid waste services would be similarly contracted by a private hauler. If the proposed Airport Master Plan is adopted, solid waste generation would increase at the Airport. If the proposed Airport Master Plan is not adopted, the excess demand for airport services would shift to other airports, and the increased solid waste generation would occur at these other airports. Since the regional quantity of solid waste generated would not change, and solid waste hauling would be privately contracted, there would be no need for additional systems, or substantial changes to existing utilities.

Water supplies

Please see discussion under IV c. above.

XIII. AESTHETICS.

a. Would the proposal result in a demonstrable potentially significant adverse effect on a scenic vista or scenic highway? No.

b. Would the proposal result in a demonstrable potentially significant adverse visual impact resultant from landform modification, development on steep slopes, and or excessive grading (cut/fill slopes)? No.

c. Would the project have any other demonstrable potentially significant negative aesthetic effect not included above? No.

d. Would the project produce excessive light or glare (i.e. dark skies)? No.

e. Would the project have a potentially significant adverse effect on the existing character of the community? No.

Brief Explanation of Aesthetics Answers (as necessary)

The proposed Airport Master Plan would result in the redevelopment of the airport. Land uses at the airport would not change, though the overall density of development would be increased. The airport is visible from Palomar Airport Road and El Camino Real, both of which are designated as scenic Community Theme Corridors (City of Carlsbad 1994b). El Camino Real provides lagoon, valley, and back country views (City of Carlsbad 1994b). Palomar Airport Road provides valley, back country, hillside, and flower field views (City of Carlsbad 1994b). The proposed project would incrementally alter the appearance of the airport from each of these roadways; however, the change perceived by motorists would be minor, and not potentially significant. Areas to the east of El Camino Real would be protected from development; and so, would not be affected by the proposed Airport Master Plan.

The proposed Airport Master Plan would result in the redevelopment of the currently-developed areas of the airport. New cut and fill slopes are not anticipated, and grading would be limited to that required to mitigate effects of landfill settlement and to provide a 100-foot-long safety area at the end of Runway 24. Impacts would not be significant.

The proposed Airport Master Plan would not change the land uses at the airport, or substantially alter its existing appearance. There would be no demonstrable potentially significant negative aesthetic effects.

The proposed Airport Master Plan incorporates additional runway lighting, and the increased development would generate additional light. The amount

of light generated would not be excessive for an airport use. No new sources of glare are anticipated.

Because the airport is an existing use, no changes to the land uses are proposed, and there are no significant environmental effects associated with the proposed Airport Master Plan (as documented by this initial study), the proposed Airport Master Plan would not have a potentially significant adverse effect on the existing character of the community.

XIV. CULTURAL AND PALEONTOLOGICAL RESOURCES.

a. Would the proposal grade or disturb geologic formations that may contain potentially significant paleontological resources? No.

b. Would the proposal grade, disturb, or threaten a potentially significant archaeological, historical, or cultural artifact, object, structure, or site which:

1) contains information needed to answer important scientific research questions;
2) has particular quality or uniqueness (such as being the oldest of its type or the best available example of its type);
3) is directly associated with a scientifically recognized important prehistoric or historic event or person;
4) is listed in, or determined to be eligible to be listed in, the California Register of Historical Resources, National Register of Historic Places, or a National Historic Landmark; or
5) is a marked or ethnohistorically documented religious or sacred shrine, landmark, human burial, rock art display, geoglyph, or other important cultural site? No.

Brief Explanation of Cultural and Paleontological Resources Answer (as necessary)

Cultural information was obtained from the 1975 Palomar Airport Master Plan EIR. According to the EIR, the San Diego Museum of Man indicated the presence of six previously recorded archaeological sites within or around the airport. Two sites fall within the proposed McClellan-Palomar Airport Master Plan area boundaries (Sites W-310 and W-521). Both of the sites are located east of El Camino Real in an area designated as Environmental Impact Avoidance Area. As such, they would not be impacted by the proposed Master Plan.

The South Central Information Center at San Diego State University reported no previously recorded archaeological or historical sites in the immediate vicinity of the project area.

Field review of the Airport property was conducted by Mr. Dave Hanna, County of San Diego, Department of Public Works, Environmental Services Unit. It was determined that:

a. Past grading and development preclude the presence of important cultural resources in built-up areas.

b. The only areas with the potential for important cultural resources on the Airport property are proposed for protection as EIAAs. Therefore cultural resource impacts would not be significant.

According to the 1975 Palomar Airport Master Plan EIR, the site contains five geologic formations. Three of these have the potential to contain fossil resources. These include the Point Loma, Torrey Sandstone, and Lindavista Formations. The Point Loma Formation may contain fossil foraminifera and calcareous nanoplankton. Torrey Sandstone typically contains only a few poorly preserved fossils and fossil casts. The Lindavista Formation is known to contain a molluscan fauna, including the extinct species *Pecten bellus* (Kennedy 1975).

Because the airport has been previously graded and developed, no significant impacts to cultural or paleontological resources are expected to occur from the implementation of the proposed master plan.

XV. OTHER IMPACTS NOT DETAILED ABOVE:

Brief Explanation of Other Impacts Answers (as necessary):

None.

XVI. MANDATORY FINDINGS OF SIGNIFICANCE.

a. Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory? No.

b. Does the project have the potential to achieve short-term, to the disadvantage of long-term, environmental goals? No.

c. Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of

past projects, the effects of other current projects, and the effects of probable future projects.) No.

d. Does the project have environmental effects which will cause substantially adverse effects on human beings, either directly or indirectly? No.

Brief Explanation of Mandatory Findings of Significance Answers (as necessary)

As described in the preceding discussions, the proposed Airport Master Plan does not have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal, community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory.

The proposed Airport Master Plan is in conformance with all relevant planning documents, and so does not achieve short-term goals to the disadvantage of long-term, environmental goals.

The proposed Airport Master Plan is a subsequent project that will have no "additional significant cumulative effects" that were not considered in the *Final Master Environmental Impact Report for the City of Carlsbad General Plan Update*, March 1994. Therefore, cumulative effects would be less than significant.

As documented in the preceding discussions, the proposed Airport Master Plan does not have any environmental effects that will cause substantially adverse effects on human beings, either directly or indirectly.

XVII. EARLIER ANALYSES.

Earlier analyses may be used where, pursuant to the tiering, program EIR, or other CEQA process, one or more effects have been adequately analyzed in an earlier EIR or negative declaration [Section 15063(c)(3)(D)]. In this case a discussion should identify the following:

a. Earlier analyses used. Identify earlier analyses and state where they are available for review.

b. Impacts adequately addressed. Identify which effects from the above checklist were within the scope of and adequately analyzed in an earlier document pursuant to applicable legal standards, and state whether such effects were addressed by mitigation measures based on any earlier analysis.

c. Mitigation measures. For effects that are "Yes, Unless Mitigated" describe the mitigation measures based on any earlier analysis.

The *Final Master Environmental Impact Report for the City of Carlsbad General Plan Update*, March 1994, was relied upon for the conclusions regarding the insignificance of cumulative air quality and traffic impacts associated with the proposed McClellan-Palomar Airport Master Plan. This EIR is available for public review during normal business hours at the City of Carlsbad Planning Department, 2075 Las Palmas Drive, Carlsbad, California. The proposed Airport Master Plan is a subsequent project that will have no "additional significant effects" on air quality or traffic that were not identified in the City's Master EIR, and no additional mitigation measures or alternatives are required.

XVIII. REFERENCES USED IN THE COMPLETION OF THE INITIAL STUDY CHECKLIST.

Acuff, Pers. Comm. 1995
David Acuff (619) 744-1050 x 3222, Planner for the City of San Marcos Planning Department. Contacted on August 7, 1995.

Burke, Pers. Comm. 1995
Carol Burke, (619) 931-2121, City of Carlsbad Fire Marshal Office. Contacted on August 9, 1995.

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Conditional Use Permit (CUP) - 172, approved September 24, 1980.

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City of Carlsbad Growth Management Program, Local Facilities Management Plan, Zone 5, prepared by the City of Carlsbad, June 17, 1987.

City of Carlsbad 1990
City of Carlsbad Growth Management Program, Citywide Facilities and Improvements Plan, Prepared September 16, 1986, and amended January 9, 1990.

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City of Carlsbad Growth Management Program, Local Facilities Management Plan, Zone 20, prepared by Jack Henthorn and Associates for the City of Carlsbad, December, 19, 1990 and revised in November 1992 and May 1993.

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Geographical Information System Habitat Map for the City of Carlsbad, 1996.

County of San Diego 1975
Palomar Airport Master Plan. Prepared for the County of San Diego, Department of Public Works, January 1, 1975.

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McClellan-Palomar Airport, Draft Airport Master Plan. Prepared for the County of San Diego, Department of Public Works by Coffman Associates, 1995.

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Addendum to the McClellan-Palomar Airport, Draft Airport Master Plan. Prepared for the County of San Diego, Department of Public Works by Coffman Associates, April 1997.

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McClellan-Palomar Airport, Airport Layout Plan, April 30, 1997.

Hogan, Pers. Comm. 1995
Mike Hogan, (619) 438-3941, Operations Superintendent for the Encinas Water Treatment Plan. Contacted on August 10, 1995.

Holland 1986.
Preliminary Description of the Terrestrial Natural Communities of California, 1986.

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Kathy Kay (619) 744-1050, Planner for the City of San Marcos Planning Department. Contacted on August 3, 1995.

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Geology of the San Diego Metropolitan Area, California, California Division of Mines and Geology, Sacramento, California, 1975.

Koper, Pers. Comm. 1995
Jack Koper, (619) 595-5300, Planner for San Diego Association of Governments. Contacted on August 3, 1995.

Larimer, Pers. Comm. 1995
Jack Larimer (619) 726-1340, Planner for the City of Vista. Contacted on August 2, 1995.

SANDAG 1994
Comprehensive Land Use Plan, McClellan-Palomar Airport, Carlsbad, California. Prepared by San Diego Association of Governments and Adopted April, 1994.

USGS 1975
United States Geological Survey, San Luis Rey 7.5 Minute Quadrangle, 1975.

Watson, Pers. Comm. 1995
Brian Watson, (619) 931-2121, City of Carlsbad Fire Marshall Office. Contacted on August 21, 1995.

Webb, Pers. Comm. 1996
Mark Webb, (619) 874-4042, County of San Diego Department Of Public Works, Environmental Services, Contacted on August 16, 1996.

Woods, Pers. Comm. 1995
Terri Woods (619) 438-1161, Planner for the City of Carlsbad. Contacted on August 2, 1995.

Ybarra, Pers. Comm. 1995
Gene Ybarra (619) 966-4770, Planner for the City of Oceanside Planning Department. Contacted on August 2, 1995.

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