CAMARILLO AIRPORT

Airport Master Plan
Draft Final

AIRPORT MASTER PLAN

Draft Final

for

CAMARILLO AIRPORT
Camarillo, California

Prepared for

VENTURA COUNTY

by

Coffman Associates, Inc.

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INTRODUCTION

INTRODUCTION

The Camarillo Airport (CMA) Master Plan Study Update has been undertaken to evaluate the airport's capabilities and role, to forecast future aviation demand, and to plan for the timely development of new or expanded facilities that may be required to meet that demand. The ultimate goal of the Master Plan is to provide systematic guidelines for the airport's overall maintenance, development, and operation.

The Master Plan is intended to be a proactive document which identifies and then plans for future facility needs well in advance of the actual need for the facilities. This is done to ensure that the Ventura County Department of Airports can coordinate project approvals, design, financing, and construction to avoid experiencing detrimental effects due to inadequate facilities.

Camarillo Airport serves as a vital economic asset for Ventura County and the region. As such, it should be carefully and thoughtfully planned and subsequently developed in a manner which matches the developmental goals of the community. An important result of this master planning effort will be a comprehensive development plan tailored to meet future facility needs. A comprehensive and proactive development plan protects development areas and ensures they will be readily available when required to meet future needs.

The preparation of this Master Plan is evidence that Ventura County recognizes the importance of air transportation to the community, as well as the unique challenges operating an airport presents. The investment in an air-

port yields many benefits to the community and the region. With a sound and realistic Master Plan, Camarillo Airport will remain an important link to the national air transportation system for the community and maintain the existing public and private investments in its facilities.

Ventura County initiated this Master Plan to re-evaluate and adjust, as necessary, the future development plan for Camarillo Airport. The last Master Plan for the airport was completed in October 1996. The County has owned and operated the airport since 1976, and is responsible for funding all capital improvements at the airport and obtaining Federal Aviation Administration (FAA) development grants. This Master Plan is intended to provide guidance through an updated capital improvement program to demonstrate the future investments required by Ventura County at Camarillo Airport. Many national, regional, and local aviation factors have changed significantly since the completion of the previous Master Plan. The County has undertaken this Master Plan to ensure that those changes can be reflected in future planning and development of the airport.

On a national level, the events of September 11, 2001, and the repercussions to the national aviation system have affected general aviation. One of the most significant effects is the shift of traditional airline passengers to the corporate aircraft market. Inconveniences and time lost due to security and large airport congestion have made corporate aircraft use more affordable and attractive. For this reason, general aviation airports in large demand centers, such as Ventura County and the greater Los Angeles metropolitan area as a whole, need to be readied to meet the growing demand.

More recently, the introduction of a new class of business jets, the very light jets (VLJs), may also have a significant impact on general aviation airports across the country. VLJs are currently being introduced to the national fleet and many orders for the aircraft are by companies wishing to provide on-demand air-taxi service. Part of the appeal of these air-taxi companies is the ability to utilize the national network of small general aviation airports and, thus, further save the consumer time.

On a regional level, the Los Angeles metropolitan area is one of the largest and still growing areas in the United States. This growth in population and employment needs to be considered in the Master Plan update.

On a local level, Ventura County supports a diverse and strong economic base. This Master Plan will consider not only the facility needs to meet demand, but also methods to ensure that the airport projects a first class image for the County.

MASTER PLAN OBJECTIVES

The primary objective of the Master Plan is to provide the community and its leadership with guidance for operating the airport in a safe and efficient manner while planning for future demand levels. Accomplishing this ob-

jective requires a comprehensive evaluation of the existing airport and a determination of what actions should be taken to maintain a safe and reliable airport facility while meeting the aviation needs of the region.

A Master Plan must be developed according to FAA requirements. However, the study can also be developed in a manner which makes it useful as a strategic business plan for the airport. FAA requires specific components within a Master Plan. These components, detailed below, are guidelines which allow for a systematic and technical approach to reach the final development plan.

While the Master Plan is technical in nature, it can also be used by airport administration and County leaders as a tool to actively promote the airport. In a sense, this Airport Master Plan is very similar to a business plan. A business plan is often necessary in order to obtain investor or bank funds for planned capital growth. So too is a Master Plan, which ultimately will enable the County and airport to compete for federal grant funds.

This Master Plan will provide a vision for the airport covering the next 20 years and, in some cases, beyond. With this vision, Ventura County will have advance notice of potential future airport funding needs so that appropriate steps can be taken to ensure that adequate funds are budgeted and planned.

Specific objectives of the Camarillo Airport Master Plan Update are:

- To preserve and protect public and private investments in existing airport facilities;
- To be reflective of community and regional goals, needs, and plans;
- To establish a schedule of development priorities designed to meet forecast aviation demand;
- To develop an orderly and comprehensive plan that is responsible to air transportation demands of the City, County, and region as a whole;
- To enhance the safety of aircraft operations;
- To meet FAA airport design standards;
- To ensure that future development is environmentally compatible;
- To coordinate this Master Plan with local, regional, state, and federal agencies, and;
- To develop active and productive public involvement throughout the planning process.

The Master Plan will accomplish these objectives by carrying out the following:

- Determining projected needs of airport users through the year 2028;
- Analyzing socioeconomic factors likely to affect air transportation

demand in Ventura County, including regional factors;

- Identifying potential existing and future land acquisition needs;

- Evaluating future airport facility development alternatives which will optimize undeveloped airport property to promote capacity and aircraft safety;

- Developing a realistic, commonsense plan for the use and expansion of the airport;

- Presenting environmental consideration associated with any recommended development alternatives, and;

- Producing current and accurate airport base maps and Airport Layout Plan (ALP) drawings.

BASELINE ASSUMPTIONS

While the ultimate recommendations of this Master Plan have yet to be determined, a study such as this typically requires several baseline assumptions that will be used throughout this analysis. The baseline assumptions for this study are as follows:

- Camarillo Airport will continue to operate as a publicly owned general aviation reliever airport through the planning period.

- The other regional general aviation airports in Ventura County will remain open for the foreseeable future.

- Camarillo Airport will continue to seek general aviation and corporate business aviation based tenants and transient operations.

- The general aviation industry will continue to grow positively through the planning period. Specifics of projected growth in the national general aviation industry are contained in Chapter Two, Aviation Demand Forecasts.

- Population and employment will continue to grow positively through the planning period as forecast by the state.

- A federal funding program will be in place through the planning period to assist in funding future capital development needs.

MASTER PLAN ELEMENTS AND PROCESS

The Camarillo Airport Master Plan Update is being prepared in a systematic fashion following FAA guidelines and industry-accepted principles and practices, as shown in **Exhibit IA**. The Master Plan has six chapters that are intended to assist in the discovery of future facility needs and provide the supporting rationale for their implementation.

Chapter One – Inventory summarizes the inventory efforts. The inventory efforts are focused on collecting and assembling relevant data pertaining to the airport and the area it serves. Information is collected on existing airport facilities and operations.

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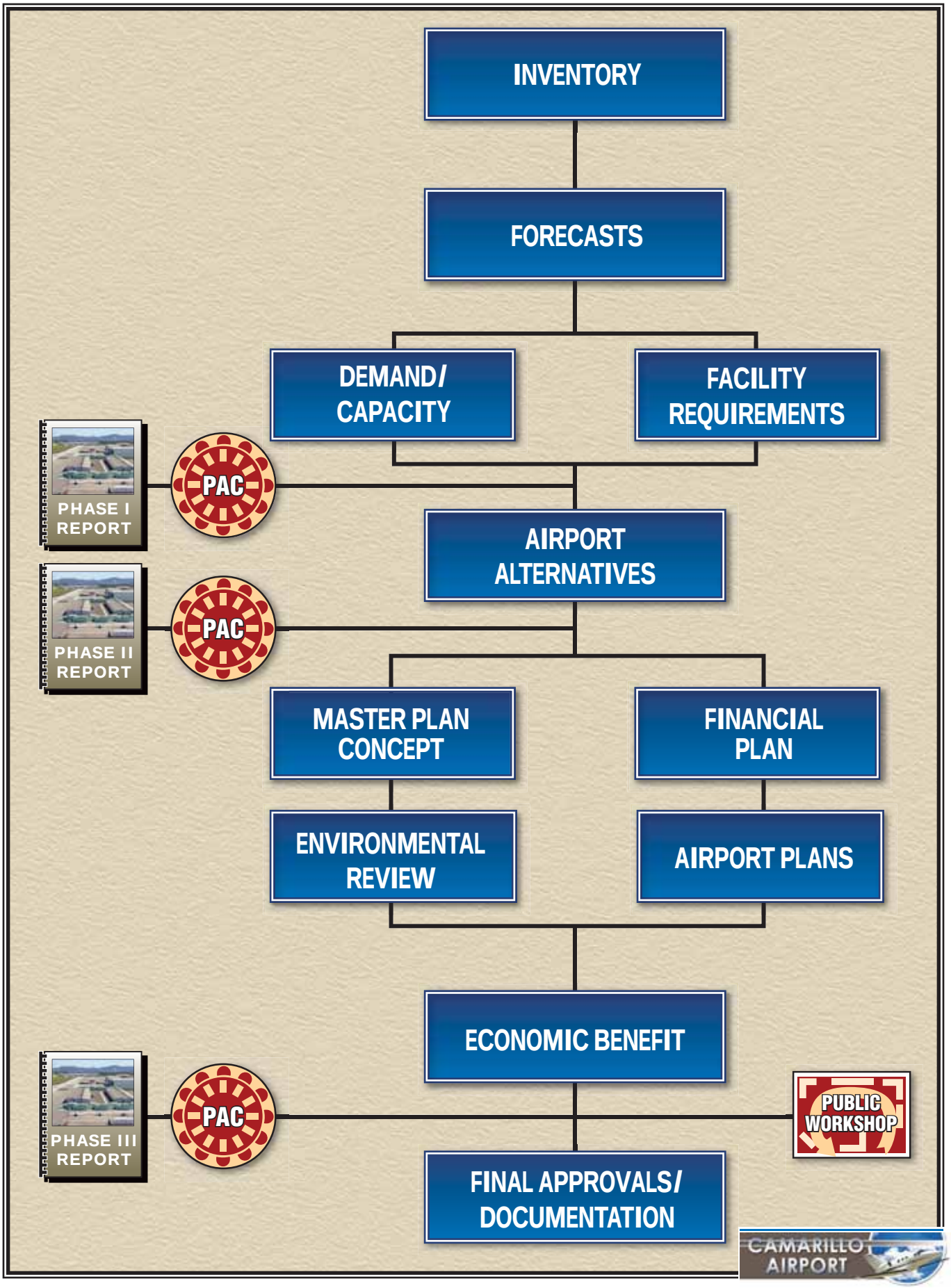

Exhibit IA
PROJECT WORK FLOW

Local economic and demographic data is collected to define the local growth trends. Planning studies which may have relevance to the Master Plan are also collected.

Chapter Two – Forecasts examines the potential aviation demand at the airport. The analysis utilizes local socioeconomic information, as well as national air transportation trends, to quantify the levels of aviation activity which can reasonably be expected to occur at Camarillo Airport through the year 2028. The results of this effort are used to determine the types and sizes of facilities which will be required to meet the projected aviation demand at the airport through the planning period.

Chapter Three – Facility Requirements comprises the demand capacity and facility requirements analyses. The intent of this analysis is to compare the existing facility capacities to forecast aviation demand and determine where deficiencies in capacities (as well as excess capacities) may exist. Where deficiencies are identified, the size and type of new facilities to accommodate the demand are identified. The airfield analysis focuses on improvements needed to safely serve the type of aircraft expected to operate at the airport in the future, as well as navigational aids to increase the safety and efficiency of operations. This element also examines the general aviation terminal, hangar, apron, and support needs.

Chapter Four – Alternatives considers a variety of solutions to accommodate the projected facility needs. This element proposes various facility and site plan configurations which can meet the projected facility needs. An analysis is completed to identify the strengths and weaknesses of each proposed development alternative, with the intention of determining a single direction for development.

Chapter Five – Airport Plans provides both a graphic and narrative description of the recommended plan for the use, development, and operation of the airport. An environmental overview is also provided. The Master Plan also includes the official Airport Layout Plan (ALP) and detailed technical drawings depicting related airspace, land use, and property data. These drawings are used by the FAA in determining grant eligibility and funding.

Chapter Six – Financial Plan focuses on the capital needs program which defines the schedules, costs, and funding sources for the recommended development projects.

Economic Benefit Study – A thorough analysis of the airport's economic value will be provided. This analysis will utilize actual data obtained from County records and a survey of airport users. This analysis will conclude by providing the airport's direct, indirect, and total economic impact on the community including value and jobs.

COORDINATION

The Camarillo Airport Master Plan Update is of interest to many within the local community. This includes

local citizens, community organizations, airport users, airport tenants, area-wide planning agencies, and aviation organizations. As an important component of the regional, state, and national aviation systems, Camarillo Airport is of importance to both state and federal agencies responsible for overseeing air transportation.

To assist in the development of the Master Plan update, the County has identified a group of community members and aviation interest groups to act in an advisory role in the development of the Master Plan. Members of the Planning Advisory Committee (PAC) will review phase reports and provide comments throughout the study to help ensure that a realistic, viable plan is developed.

To assist in the review process, draft phase reports will be prepared at various milestones in the planning process. The phase report process allows for timely input and review during each step within the Master Plan to ensure that all Master Plan issues are fully addressed as the recommended program develops.

Near the completion of the study, the information completed to date will be presented to the public via an open-house workshop. The public workshop will give the public an opportunity to view the working materials, ask questions, and provide feedback with the consultant, airport administration, and County officials. Notices of the meeting time and location will be advertised. The draft phase reports will also be made available to the public on the Coffman Associates' website (www.coffmanassociates.com).

CHAPTER ONE

INVENTORY

CHAPTER ONE

INVENTORY

The initial step in the preparation of the airport master plan update for Camarillo Airport is the collection of information that will provide a basis for the analysis to be completed in subsequent chapters. For the master plan, information is gathered regarding not only the airport, but also the region it serves. This chapter will begin with an overview of the airport location, competing airports, and typical weather conditions. This will be followed by a discussion of demographic and socioeconomic factors relevant to the region. A comprehensive overview of the national aviation system for general aviation airports and the role of Camarillo Airport in the national system are also presented. Finally, an inventory of the existing facilities at the airport will be discussed.

The information outlined in this chapter was obtained through on-site inspections of the airport, including interviews with airport management, airport tenants, and representatives of various government agencies. Information was also obtained from existing studies. Additional information and documents were provided by the Federal Aviation Administration (FAA), various departments of the City of Camarillo and Ventura County, and the California Department of Transportation - Aeronautics Division (Caltrans). A complete list of document sources is provided at the end of this chapter.

AIRPORT HISTORY

The first landing strip at the Camarillo Airport was constructed in the

spring of 1942 by the Public Roads Administration. In the fall of 1942, the facility was enlarged and upgraded for use by the Army Air Force and the Marine Corps. In 1947, the Flight Strip portion was returned to Ventura County and was used jointly by the Army, California National Guard, and the Navy. The government retained control in May of 1951 and used the airfield as an Air Force Base until it was ultimately phased out and closed.

In 1969, the Oxnard Air Force Base (Camarillo Airport) was declared surplus property by the Federal Government and was vacated by the Air Force. The facility, at that time valued at over $40 million, was transferred without cost to the County of Ventura. However, the City of Camarillo opposed the acquisition and blocked the opening of the airport for seven years.

Finally, in 1976 a compromise was reached between the City of Camarillo and Ventura County in which aircraft operations were restricted so as to control noise and air pollution. In accordance to the agreement, the 9,000-foot runway was reduced to 6,010 feet. This measure was taken to ensure adequate control over the aircraft utilizing the airport. The agreement also called for a five member Airport Authority to govern the airport and its operations.

The facility officially opened on October 21, 1976 as a general aviation airport. Within one year, the airport experienced significant growth. Fifty hangars were constructed to house over 100 based aircraft. Aircraft were coming in from all over the western United States logging, on an average weekend, between 500 and 1,000 aircraft operations.

AIRPORT CAPITAL IMPROVEMENT HISTORY

Table 1A presents an overview of capital improvements undertaken with federal grant funding at Camarillo Airport since the beginning of the last master plan update in 1994. The majority of projects undertaken involve pavement maintenance, including the rehabilitation of Runway 8-26. Several drainage projects were also undertaken.

Two projects were completed which were aimed at improving airfield and taxiing efficiency and capacity. The hold apron on Taxiway A was completed providing an enlarged area to conduct aircraft run-ups for pre-flight checks and maintenance operations. The construction of Taxiway G parallel to Taxiway F was undertaken in two phases and was designed to alleviate taxi congestion in the primary terminal area. As a result, Taxiways F and G operate as dual-parallel taxiways offering two-way flow between the airfield and eastern terminal area.

TABLE 1A
Historical Grant Information Camarillo Airport

PROJECT & GRANT NUMBER	AIP GRANT #	PROJECT COST
Fiscal Year 2008/2009	***3-06-0339-26***	***$150,000***
1. Construct northeast aircraft apron including drainage (design)		
2. Rehabilitation of east and central ramp including drainage (design)		
Fiscal Year 2007/2008	***3-06-0339-25***	***$1,665,661***
1. Construct Taxiway "A" holding apron including drainage (9,200 square yards)		
2. Rehabilitate west apron including drainage, approximately 18,000 square yards		
3. Slurry seal and striping apron and taxiways, approximately 20,000 square yards		
Fiscal Year 2006/2007	***3-06-0339-24***	***$1,700,974***
1. Rehabilitation of Portland Cement Concrete (PCC) aprons and taxiways		
2. Improve taxiway lighting		
3. Extend holding apron (design)		
4. Rehabilitation of west apron, including drainage (17,600 square yards)		
Fiscal Year 2006/2007	***3-06-0339-23***	***$180,000***
1. Airport Master Plan Update Study to include an environmental evaluation/overview		
Fiscal Year 2005/2006	***3-06-0339-22***	***$1,733,485***
1. Rehabilitation of the east side and west side apron, Phase II		
2. Rehabilitation of Portland Cement Concrete apron, Phase II		
3. Airport drainage improvement, Phase I, design only		
4. Upgrade perimeter fence		
Fiscal Year 2004/2005	***3-06-0339-21***	***$205,000***
1. Rehabilitation of the east side and west side apron, Phase II, design only		
2. Rehabilitation of Portland Cement Concrete apron, Phase II, design only		
3. Airport drainage improvement, Phase I, design only		
4. Replacement of the airport beacon		
Fiscal Year 2003/2004	***3-06-0339-20***	***$420,100***
1. Improve airport drainage, Phase III		
2. Rehabilitate aprons, approximately 150,000 square feet, Phase III		
3. Rehabilitate Runway 8-25, including Runway Safety Area		
4. Improve access gates		
Fiscal Year 2002/2003	***3-06-0339-19***	***$1,012,000***
1. Improve airport drainage, approximately 4,400 linear feet, Phase II		
2. Rehabilitate apron, approximately 150,000 square feet		
3. Rehabilitate taxiway, approximately 30,000 square feet		
4. Obstruction removal (relocation of 15 hangars in the taxiway safety area)		
5. Rehabilitation of taxiway lighting, Phase I design		
Fiscal Year 2001/2002	***3-06-0339-18***	***$1,170,000***
1. Improve airport drainage, Phase I		
2. Pavement maintenance, Phase I		
Fiscal Year 2000/2001	***3-06-0339-17***	***$702,500***
1. Construct parallel taxiway, Phase II (3,000' x 50') including lighting and marking		
2. Rehabilitate apron (approximately 64,000 square feet)		
3. Install perimeter fencing (approximately 5,000 feet)		
Fiscal Year 1999/2000	***3-06-0339-16***	***$940,500***
1. Construct parallel taxiway, Phase I (3,000' x 50') includes lighting/marking and site prep		
Fiscal Year 1998/1999	***3-06-0339-15***	***$180,000***
1. Conduct Federal Aviation Regulation Part 150 Noise Compatibility Study		
Fiscal Year 1997/1998	***3-06-0339-14***	***$1,000,000***
1. Overlay Runway 8-26, Phase 1 (approx. 6,010' x 150')		
2. Rehabilitate Safety Area (approx. 242,600 s.f.)		
3. Rehabilitate Taxiway's D & A (approx. 101,658 s.f.)		
4. Install/upgrade portion of airfield perimeter fencing		
Fiscal Year 1996/1997	***3-06-0339-13***	***$500,000***
1. Runway Overlay		

HISTORICAL AIRPORT ACTIVITY

At airports primarily serving general aviation activity, the number of based aircraft and the total annual operations (takeoffs and landings) are the key indicators of aeronautical activity. These indicators will be used in subsequent analyses in this master plan update to project future aeronautical activity and determine future facility needs.

The airport is home to approximately 533 aircraft. Based aircraft figures for the airport have fluctuated from 580 during the last master plan to approximately 533 currently. These include a wide variety of aircraft ranging from small single engine aircraft to vintage military, helicopter, turboprop, and business jet aircraft.

Annual Operations

The airport traffic control tower (ATCT) located on the airport records data regarding aircraft operations (takeoffs and landings). **Table 1B** summarizes historical annual aircraft operations at the airport since the base year in the previous airport master plan (1994).

TABLE 1B
Historical Aircraft Operation Data
Camarillo Airport

	ITINERANT					LOCAL			
YEAR	AC	Air Taxi	GA	MIL	Sub	GA	Mil	Sub	TOTAL
1994	0	2,025	82,661	2,501	87,187	103,567	96	103,663	190,850
1995	0	1,366	74,179	662	76,207	90,475	432	90,907	167,114
1996	0	2,031	83,860	61	85,952	86,885	68	86,953	172,905
1997	2	1,816	90,338	41	92,197	87,189	12	87,201	179,398
1998	0	2,039	89,420	211	91,670	81,379	29	81,408	173,078
1999	25	1,957	96,888	114	98,984	88,569	19	88,588	187,572
2000	2	2,560	101,260	123	103,945	82,428	103	82,531	186,476
2001	2	2,786	96,288	70	99,146	80,277	37	80,314	179,460
2002	0	2,823	107,365	92	110,280	93,651	10	93,661	203,941
2003	8	2,377	102,716	172	105,273	80,608	6	80,614	185,887
2004	0	2,367	91,503	176	94,046	68,827	16	68,843	162,889
2005	3	2,543	86,865	134	89,545	63,936	20	63,956	153,501
2006	0	2,996	81,266	147	84,409	64,902	514	65,416	149,825
2007	0	2,249	70,190	101	72,540	66,788	620	67,408	139,948

Aircraft operations are classified as local or itinerant. Local operations consist mostly of aircraft training operations conducted within the airport traffic pattern and touch-and-go and stop-and-go operations. Itinerant operations are originating or departing aircraft which are not conducting operations within the airport traffic pattern. Operations have historically been fairly evenly split between local and itinerant. On average over the last 14 years, local operations have represented 47 percent of total operations.

Aircraft operations are further classified in four general categories: air carrier, air taxi, general aviation, and military. Air carrier operations are typically certified to carry commercial cargo or passengers. Air taxi operations normally consist of the use of general aviation aircraft for the "on demand" commercial transport of persons and property in accordance with 14 Code of Federal Regulations (CFR) Part 135 and Subchapter K of 14 CFR Part 91. General aviation operations include a wide range of aircraft use ranging from personal to business and corporate uses. General aviation operations comprise the majority of operations at Camarillo Airport. Military use of the airport is limited.

Since 1994, total annual operations have generally been lower than the preceding year, with the exception of 1999 and 2002. In fact, the 203,941 operations achieved in 2002 represent the highest annual operational level since 1991. In 2007, however, the airport experienced only 139,948 annual operations, the lowest figure over the period. This is likely attributable to the significant increase in fuel costs and a generally weakened economy.

AIRPORT SETTING AND ADMINISTRATION

As depicted on **Exhibit 1A**, Camarillo Airport is located on approximately 650 acres of property in the corporate limits of the City of Camarillo, California. The airport is approximately three miles to the west/southwest of the City of Camarillo's central business district.

Ventura County covers an area of 1,873 square miles, including 43 miles of coastline. Approximately 7.5 miles of the shoreline is dedicated to public beaches including 411 acres of State beach parks. Ventura County is located to the northwest of Los Angeles County and is bordered to the north by Kern County, west by Santa Barbara County, and the Pacific Ocean to the southwest. The county's elevation ranges from sea level to its highest point of 8,831 feet on Mount Pinos. The County ranks as the State's 26th largest in land size, but 12th in resident population.

Camarillo is located in the eastern Oxnard Plain, with the Santa Susana Mountains to the north, the Camarillo Hills to the northwest, the Conejo Valley to the east, and the western reaches of the Santa Monica Mountains to the south. The City of Camarillo is located in Ventura County in the greater Los Angeles basin and is approximately 50 miles from downtown Los Angeles.

Pleasant Valley Road provides the primary access linking the airport with the local and regional ground transportation network. Pleasant Valley Road traverses east-west on the south side of the airport linking to Highway 1 and Oxnard to the west, as well as Los Posas, Highway 101 (Ventura Freeway), and the City of Camarillo to the east.

REGIONAL TRANSPORATION

The City of Camarillo and Ventura County are served by several significant transportation modes, including

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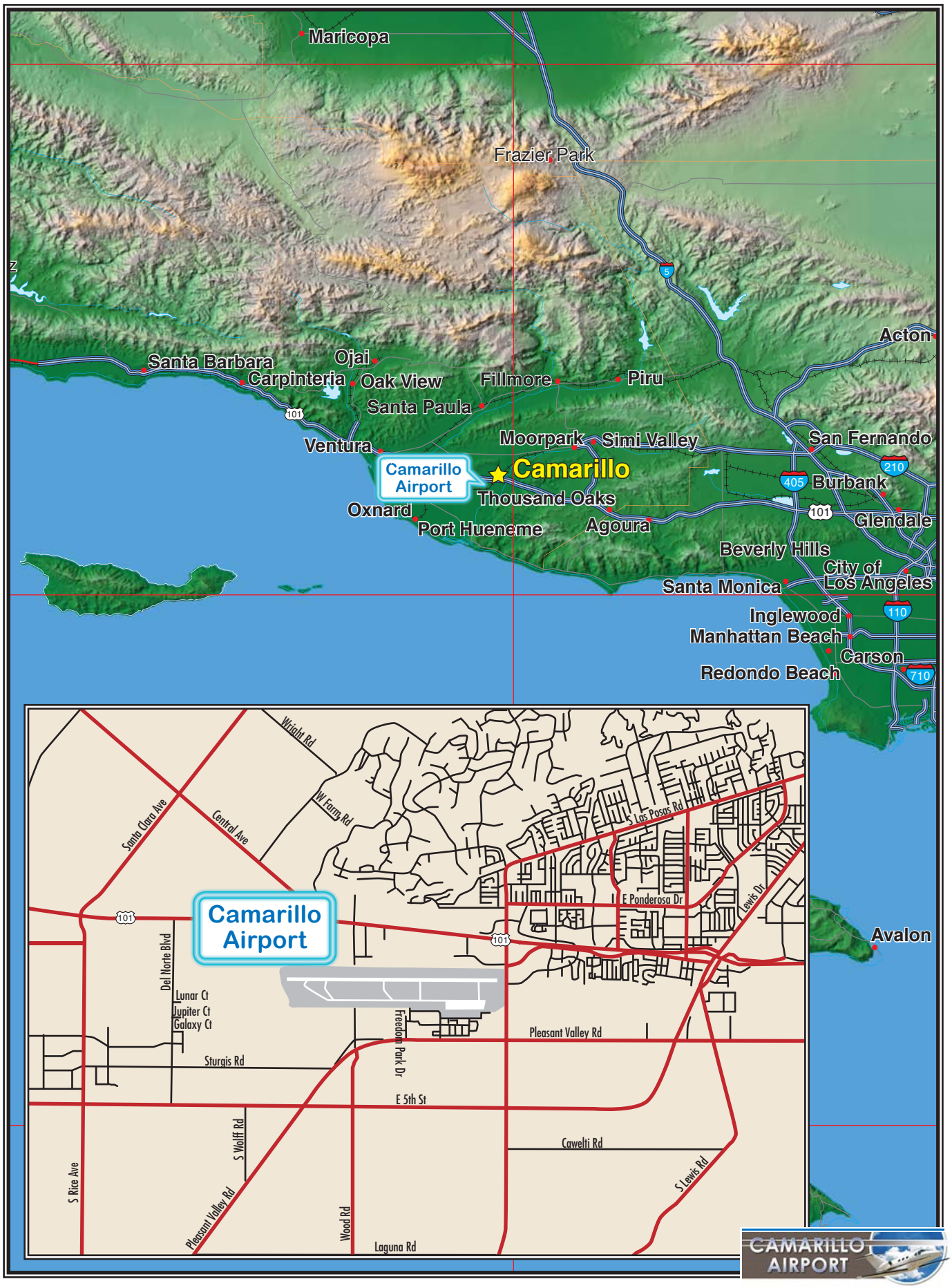

Exhibit 1A
AIRPORT SETTING

the interstate freeway system, rail system, major piers, bus lines, and transit systems. The Ventura Freeway provides access to other major routes within the area including the Pacific Coast Highway, U.S. Highway 6, San Diego Freeway, and Simi Freeway. The Ventura Freeway (Highway 101) provides direct access into Los Angeles, Burbank, and Santa Barbara.

The Camarillo Station of the Metrolink Train provides commuter-rail access to downtown Los Angeles with several stops along the route. According to Metrolink statistics, the Camarillo station boards an average of 95 passengers per day, while total Ventura County average weekday ridership is 4,317 passengers. An Amtrak station is located in Oxnard. Amtrak has several daily departures from its Oxnard Station with destinations south to San Diego and north to Seattle.

Several bus lines provide service throughout Ventura County. Camarillo Area Transit (CAT) Dial-A-Ride provides passengers with curb-to-curb service anywhere within the City of Camarillo. VISTA is a countywide transit service, which connects Camarillo with Thousand Oaks, Oxnard and Ventura. The VISTA bus service is operated by a private company under contract to the Ventura County Transportation Commission (VCTC).

The Port of Hueneme, the only deep water port between Los Angeles and San Francisco, is located 12 miles west of Camarillo. The commercial harbor facility provides service to domestic and foreign ports.

AIRPORT ADMINISTRATION

Camarillo Airport is owned by Ventura County and operated by the Ventura County Department of Airports, which is charged with the day-to-day operation, repair, maintenance, and administration of the airport. The Department of Airports oversees Oxnard and Camarillo Airports and is staffed with 32 employees. Of these 32 staff members, 23 are assigned to Camarillo Airport.

The airport is overseen by the Ventura County Board of Supervisors. The Board receives recommendations from the Ventura County Airport Advisory Commission, which is concerned with the technical aspects of the airport, and the Camarillo Airport Authority, which is concerned with the business aspects of the airport.

The Aviation Advisory Commission, which makes recommendations on both Oxnard and Camarillo Airports, consists of ten appointed members. The members are appointed by the County Board of Supervisors. Each supervisor appoints two individuals to serve on this commission.

The Camarillo Airport Authority is responsible for only Camarillo Airport and consists of five members - two members from the Board of Supervisors, two members from the Camarillo City Council, and one member from the public selected by a majority of the other four members.

REGIONAL CLIMATE

Weather conditions must be considered in the planning and development of an airport, as daily operations are affected by local weather. Temperature is a significant factor in determining runway length needs, while local wind patterns (both direction and speed) dictate the optimal orientation of the runway.

The regional climate is typical of the southern California coastal setting, moderately warm during the day and cool during the night. The average daily low temperature ranges from 44 degrees Fahrenheit in December to 69 degrees in August and September. The average daily high temperature ranges from 66 degrees in the winter months to a moderate 75 degrees in August and September.

The area experiences an average of 13.61 inches of precipitation annually. Most of the precipitation falls during the winter and early spring months. Summer and early fall months register very little precipitation. The City of Camarillo experiences sunshine approximately 70 percent of the time. The monthly average wind speed ranges from a low of 5.0 mph in December to a high of 7.4 mph in April, and the predominant wind direction is from west to east. A summary of climactic data is presented in **Table 1C**.

TABLE 1C
Climate Summary
Camarillo, California

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
High Temp. Avg.	66	66	66	68	69	72	74	75	75	73	70	67
Low Temp. Avg.	45	46	47	48	52	55	58	59	59	54	48	44
Precip. Avg.(in.)	3.0	3.27	2.55	0.65	0.18	0.05	0.01	0.09	0.40	0.31	1.14	1.96
Wind Speed (mph)	5.8	6.4	7.2	7.4	7.1	7.0	6.8	6.4	5.9	5.5	5.1	5.0
Sunshine (%)	69	71	72	70	69	72	78	78	76	74	70	68

Source: The Weather Channel; www.city-data.com

AIRPORT SYSTEM PLANNING ROLE

Airport planning exists on four primary levels: local, regional, state, and national. Each level has a different emphasis and purpose. An airport master plan is the primary local airport planning document. This master plan will provide a vision of both the airfield and landside facilities over the course of the next 20 years.

At the regional level, Camarillo Airport is included in the Southern California Association of Government (SCAG) *General Aviation System Plan* (GASP). The GASP evaluates the region's capacity and ability to meet aviation demand. Camarillo Airport is one of 44 general aviation airports included in the GASP, which SCAG considers important to meeting the region's demand for aviation services.

At the state level, the airport is included in the *California Aviation System Plan* (CASP). The purpose of the CASP is to ensure that the state has an adequate and efficient system of airports to serve its aviation needs. The CASP defines the specific role of each airport in the state's aviation system and establishes funding needs. The CASP is updated every five years with the most recent revision being completed in 2003. Camarillo Airport is one of 244 general aviation and reliever airports within the state's aviation system plan.

At the national level, the airport is included in the *National Plan of Integrated Airport Systems* (NPIAS). The NPIAS includes a total of 3,431 airports which are significant to national air transportation. Of this total, 2,847 are general aviation or reliever airports. The NPIAS plan is used by the FAA in administering the Airport Improvement Program (AIP). The NPIAS supports the FAA's strategic goals for safety, system efficiency, and environmental compatibility by identifying specific airport improvements. An airport must be included in the NPIAS to be eligible for federal funding assistance through the AIP program.

Camarillo Airport is one of 191 general aviation airports in California included in the NPIAS. The NPIAS includes estimates on the total development needs of the nation's airports which are eligible for federal funding assistance. Camarillo Airport has been designated by the NPIAS as a reliever airport for the region's commercial service airports. Reliever airports are high-capacity general aviation airports in major metropolitan areas. These specialized airports serve as attractive alternatives to using congested commercial service airports for general aviation aircraft.

Camarillo Airport is one of seven designated reliever airports in the southern California region. According to the NPIAS, the 274 reliever airports across the country have an average of 232 based aircraft and account for 29 percent of the nation's general aviation fleet.

SOUTHERN CALIFORNIA ASSOCIATION OF GOVERNMENTS (SCAG) GENERAL AVIATION SYSTEM PLAN

In 2003, SCAG completed the GASP. As the Metropolitan Planning Organization (MPO) for the region, the SCAG is charged with coordinating transportation planning among the constituent governments. As the regional aviation plan for commercial service airports is implemented, there will be a "ripple effect" through the aviation system, where rising costs and less available capacity will impact smaller general aviation airports.

The GASP is intended to provide aviation forecasts for each general aviation airport in the system. The study also provides a better understanding of corporate aviation in the region and identifies potential growth trends. The potential impacts of the *Regional Aviation Plan* implementation on corporate and smaller general aviation activity are also discussed.

The GASP recognizes that many general aviation airports are supporting an increasing level of corporate aviation activity, particularly cabin-class business jets. The emergence of "fractional ownership" aircraft, essentially a time-share agreement for a portion of an aircraft, has greatly impacted general aviation airports.

With increased security requirements and airline delay becoming more prevalent in the post-9/11 aviation environment, many corporate executives are looking to charters or fractional programs to reduce their travel times and, therefore, save money.

The SCAG-GASP will be considered throughout this master planning process. Review of the baseline aviation demand forecasts in comparison with more recent forecasts will be presented in the chapters to follow.

CALIFORNIA AVIATION SYSTEM PLAN (CASP)

The California Department of Transportation Division of Aeronautics (Caltrans) actively participated in aviation planning and capital improvement projects in the state. The CASP is composed of ten Elements and Working Papers and is updated every five years. The CASP is developed in consultation with regional transportation planning agencies and is adopted by the California Transportation Commission.

The CASP was updated in 2003 and includes minimum standards depending on the airport classification. The minimum standards are presented in **Table 1D**. Camarillo Airport is classified as a metropolitan general aviation airport and it meets the minimum standards for this classification. The minimum standards may need to be exceeded depending on local airport activity. Further analysis of the needs for Camarillo Airport will be provided in subsequent chapters of this master plan.

PREVIOUS AIRPORT MASTER PLAN

Ventura County adopted the previous airport master plan for Camarillo Airport in December 1996. The proposed developments included an array of airside and landside improvements. Due to high air traffic activity, the plan recommended the development of a parallel runway to be located 700 feet south of the airport's existing runway. The parallel runway would serve to alleviate operational congestion and delay as it was designed primarily for small aircraft and training operations. A midfield parallel taxiway was also proposed which was proposed 400 feet south of the existing runway centerline.

Landside development proposed in the previous master plan focused on relieving taxiing efficiency along Taxiway F in the primary terminal area, extending the flight line to the west for aviation businesses, reconfiguring port-a-port hangar layouts, and increasing hangar and fuel capacities. A new taxiway, parallel and north of Taxiway F, was proposed to provide two-way circulation in the main ter-

minal area. This taxiway has been constructed. Several port-a-port hangars were relocated to the west as proposed. Moreover, several airport businesses have been developed in the western terminal area and the fuel farm has been expanded as proposed in the plan.

TABLE 1D
Caltrans Airport Classification Minimum Standards

Airport Element	Metropolitan GA	Regional GA	Community GA	Limited Use GA
Runway Length	5,000' below 3,000' MSL; 6,000' above 3,000' MSL; or as provided in AMP.	Sufficient to accommodate 100% of fleet at 60% useful load.*	Sufficient to accommodate 100% of small fleet with 10 or fewer seats.*	Sufficient to accommodate 75% of small fleet with 10 or fewer seats.*
Runway Width	100'	75'	75'	60'
Runway Strength Minimum	25,000 SWL	12,500 SWL	12,500 SWL	12,500 SWL
Runway Approach Lights	MALS to runway with precision approach.	None	None	None
Weather Aids	24-Hour ASOS/AWOS	24-Hour ASOS/AWOS	24-Hour ASOS/AWOS if IFR approach or Part 135 air ambulance operator on field.	None
Landing Aids	VASI/PAPI to lighted runway if no approach lights; REIL for IFR runway w/o approach lights.	VASI/PAPI to lighted runway if no approach lights; REIL for IFR runway w/o approach lights.	VASI/PAPI to lighted runway if no approach lights; REIL for IFR runway w/o approach lights.	None
Fuel	Jet A and AvGas	AvGas; Jet A unless runway less than 3,000'	AvGas	None

MSL: Mean Sea Level
AMP: Airport Master Plan
SWL: Single Wheel Loading (Landing gear with a single wheel on each strut)
MALS: Medium intensity approach lighting system
IFR: Instrument Flight Rules
VASI: Visual approach slope indicator
PAPI: Precision approach slope indicator
ASOS: Automated surface observation system
AWOS: Automated weather observation system
REIL: Runway End Identifier Lights
* As defined in FAA AC 150/5325-4A

Source: California Aviation System Plan

AIRSIDE FACILITIES

Airport facilities can be functionally classified into two broad categories: airside and landside. The airside category includes those facilities which are needed for the safe and efficient movement of aircraft, such as runways, taxiways, lighting, and navigational aids. The landside category includes those facilities necessary to provide a safe transition from surface-to-air transportation and support aircraft servicing, storage, maintenance, and operational safety on the ground.

Existing airside facilities are identified on **Exhibit 1B**. **Table 1E** summarizes airside facility data for Camarillo Airport.

TABLE 1E
Airside Facility Data
Camarillo Airport

	RUNWAY 8-26
Runway Length (feet)	6,013
Runway Width (feet)	150
Runway Surface Material (Condition)	Asphalt (Good)
Runway Markings (Condition)	Nonprecision (Fair)
Runway Lighting	Medium Intensity (MIRL)
Runway Load Bearing Strength (pounds) Single Wheel Loading (SWL) Dual Wheel Loading (DWL) Dual Tandem Wheel Loading (DTWL)	 50,000 80,000 125,000
Taxiway Lighting	Medium Intensity (MIRL)
Taxiway, Taxilanes & Apron Lighting	Centerline marking, Tie-down area marking
Traffic Pattern Altitude (Feet Above Ground Level) Single Engine Aircraft Multi-Engine Aircraft/Jets	Right (8); Left (26) 800 1,000
Visual Approach Aids	PAPI-2L (8-26) REIL (8-26)
Published Instrument Approaches	RNAV (GPS) (8) RNAV (GPS) Y (26) RNAV (GPS) Z (26) VOR (26)
Helicopter Training Pad	North of runway
Weather and Navigational Aids	Automated Surface Observation System (ASOS) Lighted Wind Cone Airport Beacon Airport Traffic Control Tower (ATCT) Automated Terminal Information System (ATIS) Terminal VOR

PAPI - Precision Approach Path Indicator
GPS - Global Positioning System
VOR - Very high frequency Omni-directional Range
REIL - Runway End Identification Lights

Source: Airport Facility Directory; AirNav.com; Airport records.

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KEY

ASOS	Automated Surface Observation Station
ATCT	Airport Traffic Control Tower
REIL	Runway End Identifier Lighting
PAPI	Precision Approach Path Indicator
TVOR	Terminal Very High Frequency Omni-directional Range
A-G	Taxiway Designator

Ventura Freeway
101
HELICOPTER TRAINING PAD
Camarillo Hills Drain
Perimeter Road
Ventura Blvd.
Camarillo Center Dr.
REIL
REIL
RUNWAY 8-26 6,013' x 150'
SEGMENTED CIRCLE
PAPI-2
TVOR
HELICOPTER STAGING
ASOS
HOLD APRON
A
B
C
D
E
F
F
G-3
G
G-2
G-1
Las Posas Rd.
ULTRALIGHT AIRPARK
ATCT
VENTURA COUNTY SHERRIFF FIRING RANGE
Pleasant Valley Road
NORTH
0
1000
2000
SCALE IN FEET

CAMARILLO AIRPORT

Exhibit 1B
AIRFIELD FACILITIES

RUNWAYS

Camarillo Airport is served by a single runway constructed of asphalt. Runway 8-26 is 6,013 feet long by 150 feet wide. The runway pavement was rehabilitated in 1996 and is in good condition. The pavement has been strength-rated at 50,000 pounds single wheel loading (SWL), 80,000 pounds dual wheel loading (DWL), and 125,000 pounds dual tandem wheel loading (DTWL). These strength ratings refer to the configuration of the aircraft landing gear. For example, SWL indicates an aircraft with a single wheel on each landing gear.

TAXIWAYS

The existing taxiway system at Camarillo Airport consists of a full-length parallel taxiway with five entrance/exit taxiways as well as the terminal area parallel Taxiway G, which has three associated connectors. Parallel Taxiway F is 50 feet wide, constructed of concrete, and is located 1,000 feet to the south of Runway 8-26 (centerline to centerline). Parallel Taxiway G is a terminal connector taxiway linking Taxiway A with the easternmost portion of the terminal area (Taxiway G-1). Taxiway G serves to provide two-way taxiing circulation in the congested terminal area.

Exit taxiways B, C, D, and E run in a curved manner between parallel Taxiway F and the runway as depicted on **Exhibit 1B**. Taxiway A is oriented at a 90 degree angle to the runway, linking the Runway 26 threshold to Taxiway F. Taxiways B, E, F, and G-1 are constructed of concrete and the remainder of the taxiways are asphalt. All taxiways are strength rated at 40,000 pounds SWL and 55,000 pounds DWL.

HELICOPTER OPERATIONS AND TRAINING PAD

Camarillo Airport supports multiple helicopter training operations, as well as based and itinerant helicopter operations. In fact, the Ventura County Sheriff's helicopter unit is based at Camarillo Airport (Hangar 3). The Sheriff and ATCT have a Letter of Agreement (LOA) that establishes the operational routes used by the Sheriff's aircraft.

The airport does not have a dedicated helipad, however, it does provide specific helicopter operations areas. There is a large paved area to the north of the ATCT and Taxiway F that serves as a helicopter operations area. A helicopter training pad has been developed to serve helicopter training operations, including auto-rotations. The facility is located 500 feet north of Runway 26, perpendicular to Taxiway B as depicted on **Exhibit 1B**. There are four dedicated parking spots for helicopters; two spots near the intersection of Taxiways E and G-1, and two spots in the northern portion of the main ramp near the Waypoint Café.

PAVEMENT MARKINGS

Pavement markings aid in the movement of aircraft along airport surfaces

and identify closed or hazardous areas on the airport. The nonprecision markings on Runway 8-26 identify the runway centerline, threshold, designation, and hold positions. Taxiway and apron centerline markings assist pilots when moving on these surfaces. In addition, all aircraft tie-down areas are outlined with standard striping.

AIRFIELD LIGHTING

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

Identification Lighting: The location of the airport at night is universally identified by a rotating beacon. The rotating beacon projects two beams of light, one white and one green, 180 degrees apart. The rotating beacon at Camarillo Airport is situated on the top of a water tower adjacent to the intersection of Airport Way and Pleasant Valley Road approximately 3,800 feel southeast of the Runway 26 threshold.

Runway and Taxiway Lighting: Runway and taxiway lighting utilizes light fixtures placed near the edge of the pavement to define the lateral limits of the pavement. This lighting is essential for safe operations during night and/or times of low visibility in order to maintain safe and efficient access to and from the runway and aircraft parking areas.

Runway 8-26 is equipped with medium intensity runway lighting (MIRL). These are lights set atop a pole that is approximately one foot above the ground. The light poles are frangible, meaning if one is struck by an object, such as an aircraft wheel, they can easily break away, thus limiting the potential damage to an aircraft. Runway threshold lighting identifies each runway end.

Medium intensity taxiway lighting (MITL) is associated with the taxiways. These lights are mounted on the same type of structure as the runway lights. All taxiway lights are LED.

Visual Approach Lighting: Runway 8-26 is equipped with precision approach path indicators (PAPIs) which are a system of colored lights arranged to provide visual descent guidance information during the approach to a runway. PAPI-2 is a system of two identical light units placed on the left side of the runway in a line perpendicular to the centerline. These aids provide the pilot with an indication of being above, below, or on the correct descent path to the runway.

Runway End Identification Lighting: Set to either side of the Runway 8 and 26 thresholds are runway end identification lighting (REIL). REILs provide a visual identification of the runway end for landing aircraft. The system consists of two flashing light assemblies located approximately 40 feet to either side of the runway landing threshold. These flashing lights can be seen day or night for up to 20

miles depending on visibility conditions.

Airfield Signs: Airfield identification signs assist pilots in identifying their location on the airfield and directing them to their desired location. The airfield signs, including the runways, taxiways, and distance-to-go markings, are lighted at Camarillo Airport.

Pilot-Controlled Lighting: When the ATCT is closed, the airfield lights are turned off. With the pilot-controlled lighting system (PCL), pilots can turn on the airfield lights from their aircraft, through a series of clicks of their radio transmitter. The PCL system at Camarillo Airport will turn on the MIRL and REIL systems. Typically, the airfield lights will remain on for approximately 15 minutes.

WEATHER AND COMMUNICATION AIDS

Camarillo Airport has three lighted wind cones, one at each runway end and one in the segmented circle adjacent to Taxiway B. The lighted wind cones provide information to pilots regarding wind conditions, such as direction and speed. The segmented circle is located adjacent to Taxiway B south of Runway 8-26. A segmented circle provides pilots with information about the local airport traffic pattern.

Camarillo Airport is equipped with an Automated Surface Observing System (ASOS). An ASOS will automatically record weather conditions such as wind speed, wind gust, wind direction, temperature, dew point, altimeter setting, visibility, fog/haze condition, precipitation, and cloud height. This information is then transmitted at regular intervals (usually once per hour). Pilots and individuals can call a published telephone number (805-384-9294) and receive the information via an automated voice recording.

The ASOS at Camarillo Airport is located between Taxiways A and B approximately 200 feet north of parallel Taxiway F as depicted on **Exhibit 1C**. A stand alone weather sensor (SAWS) which provides information to the ATCT is located west of Taxiway B approximately 300 feet north of parallel Taxiway F.

Camarillo Airport is also equipped with an automated terminal information service (ATIS), which is a recorded message updated hourly and broadcast on 126.025 MHz. ATIS broadcasts are used by airports to notify arriving and departing pilots of the current surface weather conditions, runway and taxiway conditions, communication frequencies, and other information of importance to arriving and departing aircraft. The ATIS broadcast includes the ASOS information and can be accessed on the same frequency or via telephone at (805) 484-3351.

Camarillo Airport also utilizes a common traffic advisory frequency (CTAF). This radio frequency (128.2 MHz) is used by pilots in the vicinity of the airport to communicate with each other about approaches or takeoffs from the airport when the ATCT is closed. The same frequency will

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KEY

ASOS	Automated Surface Observation Station
ATCT	Airport Traffic Control Tower
PAPI	Precision Approach Path Indicator
SAWS	Stand Alone Weather Sensor
TVOR	Terminal Very High Frequency Omni-directional Range
A-G	Taxiway Designator

0 300
SCALE IN FEET

NORTH

26

SEGMENTED CIRCLE

PAPI-2

1 TVOR

C

B

A

SAWS

HELICOPTER OPERATION AREA 2

6 ASOS

F

7 SELF-SERVE FUEL ISLAND

ABOVE GROUND TANK 8

SUN AIR 4

5 ATCT

ULTRALIGHT AIRPARK

SUN AIR FUEL FARM

3 SUN AIR

3 SUN AIR

PORT-A-PORT HANGARS 11

12 AVANTAIR

FRESH AIR/ORBIC

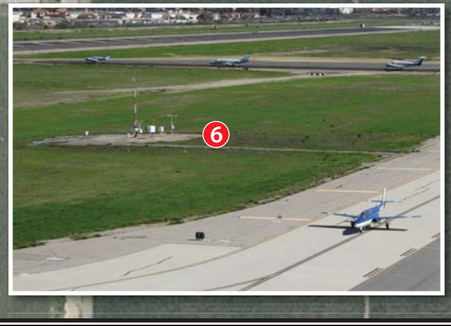
Aviation Dr.

PUBLIC RESTROOMS 9

10 STAND-BY GENERATOR

Durley Ave.

Convair St.



CAMARILLO AIRPORT

Exhibit 1C
WEST-SIDE AIRPORT FACILITIES

reach the ATCT if the tower is open. Ground control can be reached via 121.8 MHz during tower hours. NAS Point Mugu provides approach, departure, and clearance delivery primarily on 124.7 MHz. When NAS Point Mugu service is unavailable, approach/departure services are provided by the Los Angeles air route traffic control center (ARTCC).

NAVIGATIONAL AIDS

Navigational aids are electronic devices that transmit radio frequencies, which pilots of properly equipped aircraft can translate into point-to-point guidance and position information. The types of electronic navigational aids available for aircraft flying in the vicinity of Camarillo Airport include a very high frequency omni-directional range (VOR) facility and the global positioning system (GPS).

The VOR, in general, provides azimuth readings to pilots of properly equipped aircraft transmitting a radio signal at every degree to provide 360 individual navigational courses. Frequently, distance measuring equipment (DME) is combined with a VOR facility (VOR/DME) to provide distance as well as direction information to the pilot. Military tactical air navigation aids (TACANs) and civil VORs are commonly combined to form a VORTAC. The VORTAC provides distance and direction information to both civil and military pilots.

Currently, Camarillo Airport is equipped with an on-site VOR/DME. The VOR/DME broadcasts on VHF frequency 115.8, providing the pilot with directional and distance information to and from the airport. The beacon continuously transmits the three letter identifier "CMA." It is located between Taxiways B and C, south of the runway.

The Ventura VOR/DME is located approximately six nautical miles southeast of the Camarillo Airport and transmits on VHF frequency 108.2 MHz. The beacon transmits a continuous three-letter identifier code "VTU" using International Morse Code. Another VOR/DME used for navigation within the Camarillo Airport airspace is located at Van Nuys approximately 30 nm to the east. The Van Nuys VOR/DME transmits on VHF frequency 113.1 and continuously broadcasts the three letter identifier code "VNY."

The Fillmore VORTAC is the only VORTAC located in the vicinity of Camarillo Airport. It is located approximately 14 nautical miles northeast of the airport. The VOR operates on a frequency of 112.5 MHz and the TACAN Channel 72. The beacon transmits a continuous three-letter identifier code "FIM." These navigational aids incorporate the VOR and DME to function as a single channelized VHF/UHF system. Operating in conjunction with the ground station, a properly equipped aircraft is able to translate the VORTAC signals into a visual display of both azimuth and distance.

Global Positioning System (GPS) is an additional navigational aid for pilots. GPS was initially developed by the

United States Department of Defense for military navigation around the world. GPS differs from a VOR in that pilots are not required to navigate using a specific ground-based facility. GPS uses satellites placed in orbit around the earth that transmit electronic radio signals, which pilots of properly equipped aircraft use to determine altitude, speed, and other navigational information. With GPS, pilots can navigate directly to any airport in the country and are not required to navigate using a ground-based navigational facility.

Loran-C is another point-to-point navigation system available to pilots. Where GPS utilizes satellite-based transmitters, Loran-C uses a system of ground-based transmitters.

AREA AIRSPACE

The Federal Aviation Administration (FAA) Act of 1958 established the FAA as the responsible agency for the control and use of navigable airspace within the United States. The FAA has established the National Airspace System (NAS) to protect persons and property on the ground and to establish a safe environment for civil, commercial, and military aviation. The NAS is defined as the common network of U.S. airspace, including air navigational facilities; airports and landing areas; aeronautical charts; associated rules, regulations, and procedures; technical information; and personnel and material. System components shared jointly with the military are also included as part of this system.

To ensure a safe and efficient airspace environment for all aspects of aviation, the FAA has established an airspace structure that regulates and establishes procedures for aircraft using the National Airspace System. The U.S. airspace structure provides for categories of airspace, controlled and uncontrolled, and identifies them as Classes A, B, C, D, E, and G as described below. **Exhibit 1D** generally illustrates each airspace type in three-dimensional form.

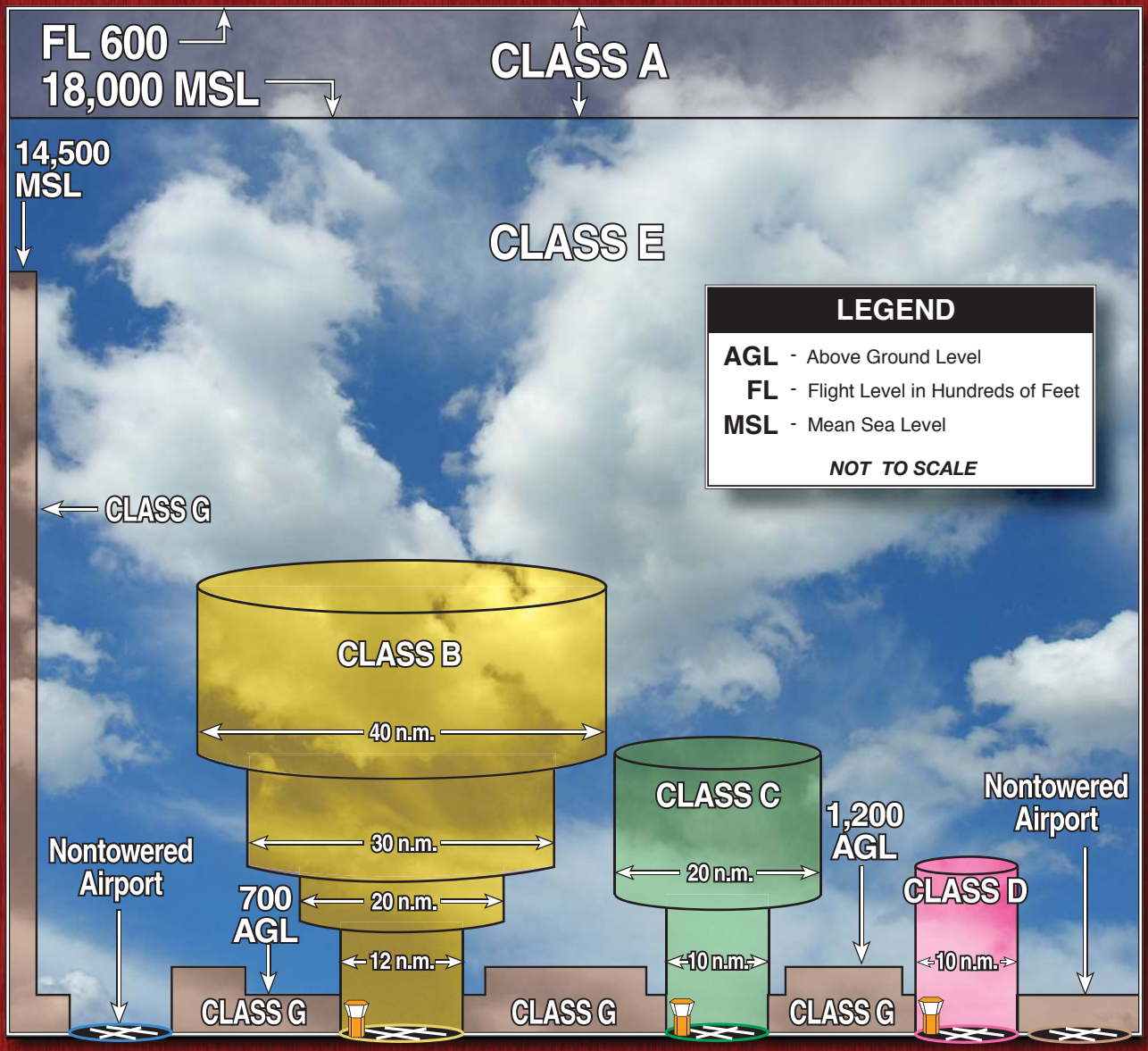
- Class A airspace is controlled airspace and includes all airspace from 18,000 feet mean sea level (MSL) to Flight Level 600 (approximately 60,000 feet MSL).

- Class B airspace is controlled airspace surrounding high-activity commercial service airports (i.e., Los Angeles International Airport).

- Class C airspace is controlled airspace surrounding lower-activity commercial service (i.e., Ontario, Orange County) and some military airports (March AFB).

- Class D airspace is controlled airspace surrounding low-activity commercial service and general aviation airports with an ATCT, such as Camarillo Airport.

All aircraft operating within Classes A, B, C, and D airspace must be in constant contact with the air traffic



CLASSIFICATION	DEFINITION
CLASS A	Generally airspace above 18,000 feet MSL up to and including FL 600.
CLASS B	Generally multi-layered airspace from the surface up to 10,000 feet MSL surrounding the nation's busiest airports.
CLASS C	Generally airspace from the surface to 4,000 feet AGL surrounding towered airports with service by radar approach control.
CLASS D	Generally airspace from the surface to 2,500 feet AGL surrounding towered airports.
CLASS E	Generally controlled airspace that is not Class A, Class B, Class C, or Class D.
CLASS G	Generally uncontrolled airspace that is not Class A, Class B, Class C, Class D, or Class E.

Source: "Airspace Reclassification and Charting Changes for VFR Products," National Oceanic and Atmospheric Administration, National Ocean Service. Chart adapted by Coffman Associates from AOPA Pilot, January 1993.

CAMARILLO AIRPORT

Exhibit 1D
AIRSPACE CLASSIFICATION

control facility responsible for that particular airspace sector.

- Class E airspace is controlled airspace surrounding an airport that encompasses all instrument approach procedures and low-altitude federal airways. Only aircraft conducting instrument flights are required to be in contact with air traffic control when operating in Class E airspace. While aircraft conducting visual flights in Class E airspace are not required to be in radio contact with air traffic control facilities, visual flight can only be conducted if minimum visibility and cloud ceilings exist.

- Class G airspace is uncontrolled airspace that does not require communication with an air traffic control facility.

Airspace within the vicinity of Camarillo Airport is depicted on **Exhibit 1E**. When the ATCT is open, the airport is located under Class D airspace. Class D airspace extends to a five nautical mile radius from the ATCT except to the west and south where it is interrupted by the Oxnard Airport and NAS Point Mugu Class D airspaces. The Camarillo Airport Class D airspace extends from the ground to an elevation of 2,500 feet above ground level (AGL).

When the tower is closed, the airport operates in Class E airspace with a floor of 700 feet AGL and extending to 18,000 feet MSL. The Class E airspace surrounding the airport includes most of the region and to the north near Santa Paula.

Regional Airports

There are a number of airports of various sizes, capacities, and functions within the vicinity of Camarillo Airport, as indicated on **Exhibit 1E**. In an urban/suburban setting, airports within 30 nautical miles of each other will generally have some influence on the activity of the other airport. The airports described below are those within approximately 30 nautical miles of Camarillo Airport or are important to the airspace and control environment of the area. Information pertaining to each airport was obtained from the FAA's *5010-Airport Master Record* forms and AirNav.com.

Oxnard Airport (OXR) is a primary commercial service airport also owned and operated by the Ventura County Department of Airports. It is located six nm west of Camarillo Airport and is supported by a single runway (5,953 feet long). United Express, operated by Sky West Airlines, provides four daily departures from OXR to Los Angeles International Airport (LAX). There are approximately 184 based aircraft. A full range of general aviation services are available at Oxnard Airport provided by two fixed base operators. The airport is supported by an ATCT, Class D airspace, and has five published instrument approach procedures, including an ILS to Runway 5. The airport experienced 76,524 aircraft operations in 2007.

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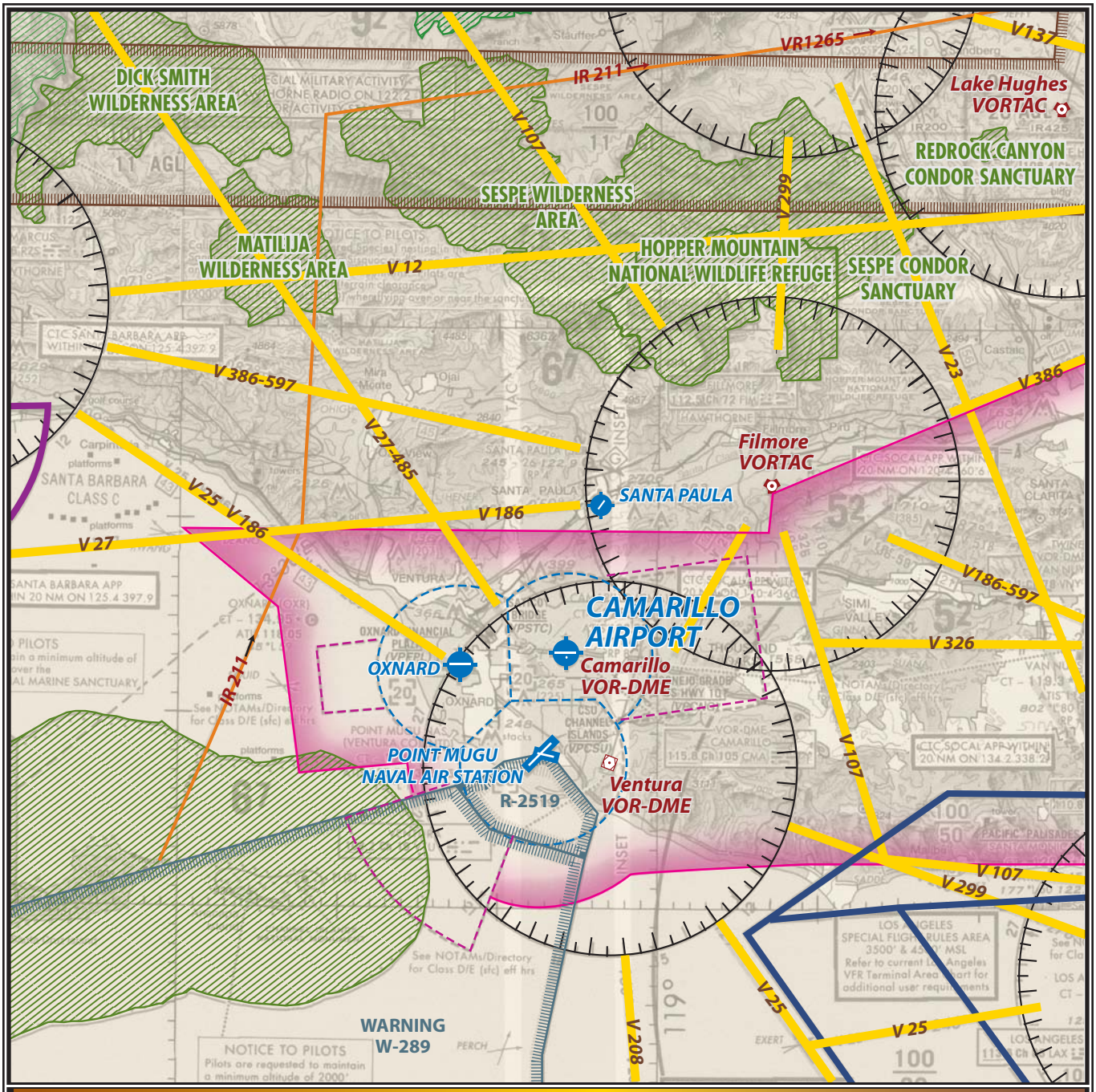

LEGEND

- Airport with other than hard-surfaced runways
- Airport with hard-surfaced runways1,500' to 8,069' in length
- Airports with hard-surfaced runways greater than 8,069' or some multiple runways less than 8,069'
- VORTAC
- VOR-DME
- Compass Rose
- Wilderness Area
- Class B Airspace
- Class C Airspace
- Class D Airspace
- Class E Airspace
- Class E Airspace with floor 700 ft. above surface
- Prohibited, Restricted, Warning and Alert Areas
- Special Military Activity
- Victor Airways
- Military Training Routes

Source: Los Angeles Sectional Charts, US Department of Commerce, National Oceanic and Atmospheric Administration 01/17/08

NORTH

NOT TO SCALE

CAMARILLO AIRPORT

Exhibit 1E
VICINITY AIRSPACE

NAS Point Mugu (NTD) is a Naval Air Station (NAS) military installation with an 11,102-foot long concrete runway. The airport is primarily utilized by Naval and Marine aircraft. There are six published instrument approach procedures, including an ILS approach to Runway 21, as well as radar approach procedures. This facility is not open to the public without prior permission.

Santa Paula Airport (KSZP) is a privately owned, public use airport located approximately eight north of CMA. The airport supports a single runway that is 2,665 feet long by 60 feet wide. The airport provides an array of general aviation services and reports 259 based aircraft and an estimated 97,000 annual operations. There are no published instrument approach procedures for Santa Paula Airport.

Van Nuys Airport (VNY) is located approximately 30 nautical miles east of Camarillo Airport. Van Nuys has a parallel runway system, with the longest runway, Runway 16R-34L, at 8,001 feet in length. Parallel Runway 16L-34R is 4,011 feet in length. Van Nuys Airport is equipped with an airport traffic control tower and four published instrument approaches, including an ILS approach to Runway 16R. An estimated 776 aircraft are based at Van Nuys Airport, including 155 jet aircraft. A full range of general aviation services are offered by more than ten aviation businesses.

Victor Airways

Victor Airways are designated navigational routes extending between VOR facilities. Victor Airways have a floor of 1,200 feet above ground level and extend upward to an altitude of 18,000 feet MSL. Victor Airways are eight nautical miles wide. As previously discussed, there are a number of VOR facilities within the airport region. In the complicated regional airspace structure there are several designated Victor Airways, as seen on **Exhibit 1E**.

Military Operations Areas (MOAs)

A Military Operations Area (MOA) is an area of airspace designated for military training use. This is not restricted airspace as civil pilots can use the airspace. However, they should be on alert for the possibility of military traffic. A pilot may need to be aware that military aircraft can be found in high concentrations, conducting aerobatic maneuvers, and possibly operating at high speeds at lower elevations. The activity status of a MOA is advertised by a *Notice to Airmen* (NOTAM) and noted on Sectional Charts.

Approximately 10 nautical miles due south from the Camarillo Airport is a warning area. In general, restricted and warning areas indicate the existence of unusual, often invisible, hazards to aircraft such as artillery fir-

ing, aerial gunnery, or guided missiles. The warning area extends from NAS Point Mugu out toward the Pacific Ocean in a triangular shape. The warning area is used for weapons training by Navy and Marine high performance aircraft.

Approximately 20 nautical miles north, an eight-mile wide corridor, which runs in an east-west direction, is designated as special military use airspace. Flights in this area are not restricted; however, pilots must be aware of the potential airspace conflict in the area. The sectional chart lists the floors and ceilings of the operations and instructs navigators to contact Hawthorne Flight Service Station (FSS) to receive activity status of military operations in the area.

Restricted Areas

According to the FAA, "Restricted areas denote the existence of unusual, often invisible, hazards to aircraft such as artillery firing, aerial gunnery, or guided missiles. Penetration of restricted areas without authorization from the using or controlling agency may be extremely hazardous to the aircraft and its occupants." There is one restricted area on and south of NAS Point Mugu.

AIR ROUTE TRAFFIC CONTROL CENTER (ARTCC)

The FAA has established 21 Air Route Traffic Control Centers (ARTCC) in the continental United States to control aircraft operating under instrument flight rules (IFR) within controlled airspace and while in the enroute phase of flight. An ARTCC assigns specific routes and altitudes along federal airways to maintain separation and orderly air traffic flow. Centers use radio communication and long range radar with automatic tracking capability to provide enroute air traffic services. Typically, the ARTCC splits its airspace into sectors and assigns a controller or team of controllers to each sector. As an aircraft travels through the ARTCC, one hands off control to another. Each sector guides the aircraft using discrete radio frequencies.

The Los Angeles ARTCC located in Los Angeles, California, controls IFR aircraft entering and leaving the Camarillo area. The area of jurisdiction for the Los Angeles Center includes southern California, southern Nevada, southwestern Utah, and western Arizona.

INSTRUMENT APPROACH PROCEDURES

Instrument approach procedures are a series of predetermined maneuvers established by the FAA using electronic navigational aids to assist pilots in locating and landing at an airport during low visibility and cloud ceiling conditions. The capability of an instrument approach is defined by the visibility and cloud ceiling minimums associated with the approach. Visibility minimums define the horizontal distance that the pilot must be able to see to complete the approach. Cloud

ceilings define the lowest level a cloud layer (defined in feet above the ground) can be situated for a pilot to complete the approach. If the observed visibility or cloud ceiling is below the minimums prescribed for the approach, the pilot cannot complete the instrument approach.

Four instrument approaches have been approved and published for Camarillo Airport. The detail for the instrument approaches is presented in **Table 1F**.

TABLE 1F
Instrument Approach Data
Camarillo Airport

	WEATHER MINIMUMS BY AIRCRAFT TYPE					
	Categories A & B		Category C		Category D	
	CH	VIS	CH	VIS	CH	VIS
RNAV (GPS) RWY 8						
LNAV	532	1.00	532	1.50	532	1.75
Circling	523	1.00	523	1.50	563	2.00
RNAV (GPS) Y RWY 26						
LNAV	543	1.00	543	1.50	543	1.75
Circling	543	1.00	543	1.50	563	2.00
RNAV (GPS) Z RWY 26						
LPV	250	0.75	250	0.75	250	0.75
VOR RWY 26						
Straight-in	645	1.00	645	1.75	N/A	N/A
Circling	645	1.00	645	1.75	N/A	N/A
VOR RWY 26 (DME Minimums)						
Straight-in	605	1.00	605	1.75	N/A	N/A
Circling	605	1.00	605	1.75	N/A	N/A

Aircraft categories are based on 1.3 times the stall speed in landing configuration as follows:
Category A: 0-90 knots (Cessna 172)
Category B: 91-120 knots (Beechcraft KingAir)
Category C: 121-140 knots (Canadair Challenger)
Category D: 141-166 (Gulfstream II and IV)

Abbreviations:
CH – Cloud Height (in feet above ground level)
VIS – Visibility Minimums (in miles)
LPV – Localizer performance with vertical guidance
LNAV – Lateral Navigation

Source: U.S. Terminal Procedures, Southwest (08 May to 05 June 2008))

The RNAV (GPS) Z Runway 26 is a near precision approach procedure offering the lowest visibility minimums at the airport. The LPV approach provides both horizontal and vertical guidance utilizing GPS technology versus traditional vertical guidance technology (instrument landing system [ILS] glideslope antenna). Properly equipped aircraft are able to utilize this approach when visibility is no lower than three-quarters of a mile and cloud height ceilings are at least 250 feet above ground level.

Runway 26 also supports the LNAV (GPS) Y and VOR approaches. The LNAV Y approach is a lateral-only GPS approach providing straight-in and circling procedures with visibility minimums not lower than one mile for smaller aircraft, one and one-half miles for medium-sized business jets, and one and three-quarters of a mile for large business jets. The VOR approach to Runway 26 utilizes the Camarillo VOR with associated minimums presented in **Table 1F**. Runway 8 is served only by the RNAV (GPS) approach providing for straight-in and circling procedures. Its associated minimums are also presented in the table.

LOCAL CONDITIONS AND OPERATING PROCEDURES

Camarillo Airport is situated at 77.4 feet MSL. The traffic pattern altitude for all light aircraft is 800 feet AGL. The traffic pattern for high-performance aircraft, including multi-engine piston and jet-powered aircraft, is at 1,000 feet AGL. The airport utilizes a non-standard right-hand traffic pattern for Runway 8 and standard left-hand traffic pattern for Runway 26. The non-standard right hand traffic pattern for Runway 8 is intended to avoid traffic pattern congestion over the City of Camarillo to the north.

Runway use is dictated by prevailing wind conditions. Ideally, it is desirable for aircraft to land directly into the wind. The prevailing wind condition favors Runway 26 the majority of the time. Runway 8 is favored during Santa Ana winds.

The FAA *Airport/Facility Directory* identifies several conditions for pilots to be aware of in the vicinity of the airport. An unlighted mountain reaching 1,173 feet mean sea level (MSL) is located approximately five miles east of Runway 26. Another peak reaching 1,814 feet is located to the southeast. Also, the proximity of Oxnard Airport and NAS Point Mugu requires an understanding of the local airspace operational condition.

The City of Camarillo has established a number of voluntary noise abatement operational procedures in an effort to reduce aircraft noise for helicopters and fixed-wing aircraft. **Exhibit 1F** depicts noise abatement and generalized traffic pattern information for aircraft operating in the vicinity of the airport.

AIRPORT TRAFFIC CONTROL TOWER

The ATCT is located approximately 1,100 feet south of the runway centerline, perpendicular to Taxiway B. The tower is owned and operated by the FAA and is operational from 7:00 a.m. to 9:00 p.m., every day during the year. The Camarillo ATCT controls air traffic within the Class D airspace that surrounds Camarillo Airport. It is equipped with D-Brite airport surveillance radar.

LANDSIDE FACILITIES

Landside facilities are the ground-based facilities that support the aircraft and pilot/passenger handling

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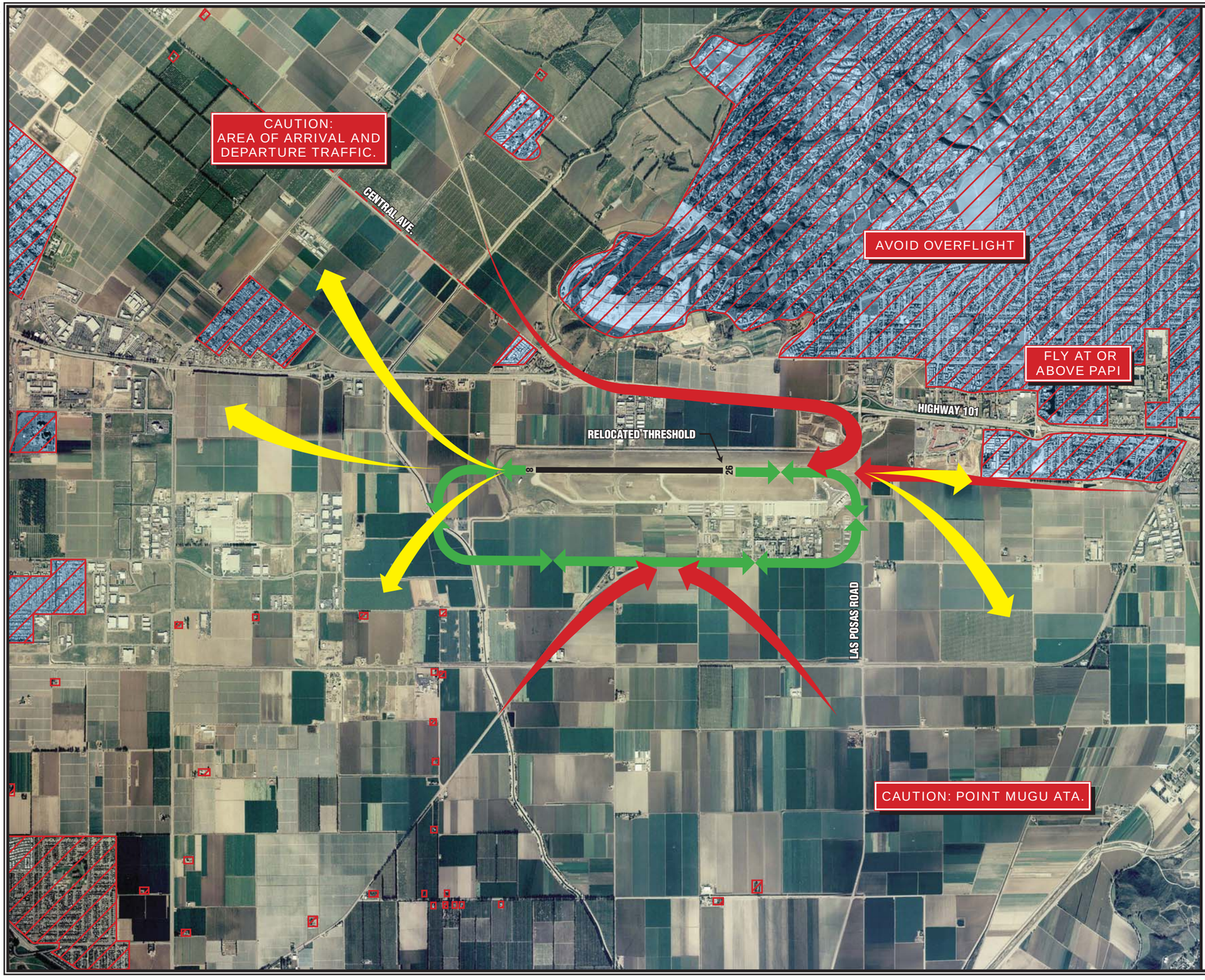


LEGEND

- Touch-and-Go Pattern
- Suggested Departure Track
- Suggested Arrival Track
- Noise-Sensitive Areas

A.O.P.A. NOISE AWARENESS STEPS

1. If practical, avoid noise-sensitive areas such as residential areas, open-air assemblies (e.g., sporting events and concerts), and national park areas. Make every effort to fly at or above 2,000 feet over the surface of such areas when overflight cannot be avoided.
2. Consider using a reduced power setting if flight must be low because of cloud cover or overlying controlled airspace or when approaching the airport of destination. Propellers generate more noise than engines; flying with the lowest practical rpm setting will reduce the aircraft's noise level substantially.
3. Perform stalls, spins, and other practice maneuvers over uninhabited terrain.
4. Many airports have established specific noise abatement procedures. Familiarize yourself and comply with these procedures.
5. Work with airport managers and fixed-base operators to develop procedures to reduce the impact on noise-sensitive areas.
6. To contain aircraft noise within airport boundaries, avoid performing engine runups at the ends of runways near housing developments. Instead, select a location for engine runup closer to the center of the field.
7. On takeoff, gain altitude as quickly as possible without compromising safety. Begin takeoffs at the start of a runway, not at an intersection.
8. Retract the landing gear either as soon as a landing straight ahead on the runway can no longer be accomplished or as soon as the aircraft achieves a positive rate of climb. If practical, maintain best-angle-of-climb airspeed until reaching 50 feet or an altitude that provides clearance from terrain or obstacles. Then accelerate to best-rate-of-climb airspeed. If consistent with safety, make the first power reduction at 500 feet.
9. Fly a tight landing pattern to keep noise as close to the airport as possible. Practice descent to the runway at low power settings and with as few power changes as possible.
10. If a VASI or other visual approach guidance system is available, use it. These devices will indicate a safe glidepath and allow a smooth, quiet descent to the runway.
11. If possible, do not adjust the propeller control for flat pitch on the downwind leg; instead, wait until short final. This practice not only provides a quieter approach, but also reduces stress on the engine and propeller governor.
12. Avoid low-level, high-power approaches, which not only create high noise impacts, but also limit options in the event of engine failure.
13. Flying between 11 p.m. and 7 a.m. should be avoided whenever possible. (Most aircraft noise complaints are registered by residents whose sleep has been disturbed by noisy, low-flying aircraft.)

Note: These recommendations are general in nature; some may not be advisable for every aircraft in every situation. No noise reduction procedure should be allowed to compromise flight safety.

NORTH

NOT TO SCALE

CAMARILLO AIRPORT

Exhibit 1F
LOCAL OPERATIONAL PROCEDURES

functions. These facilities typically include the fixed base operators (FBOs), aircraft storage hangars, aircraft maintenance hangars, aircraft parking aprons, and support facilities such as fuel storage, automobile parking, roadway access, and aircraft rescue and firefighting. The facilities and businesses located on the west side of the airport were presented earlier on **Exhibit 1C.** The central and eastern airport facilities and businesses are depicted on **Exhibit 1G**.

AIRPORT BUSINESSES

A full range of aviation services are available at Camarillo Airport. This includes aircraft rental, flight training, aircraft maintenance, aircraft charter, aircraft fueling, and many other services. The following provides a brief discussion of general aviation businesses at the airport:

Fixed Base Operators (FBO)

Avantair Services – Full service FBO which operates as the west coast maintenance base for Avantair, the exclusive provider of fractional aircraft shares in the Piaggio Avanti P.180 aircraft. This FBO offers Shell 100LL and Jet A fuel and general aviation pilot and passenger terminal services.

Channel Islands Aviation – Full service FBO providing Chevron fuel (100LL and Jet A), flight training (FixedWing), and aircraft charters.

Sun Air Jets – Full service FBO providing an array of services including Exxon fuel (100LL and JetA), worldwide charter services, aircraft management, aircraft maintenance, and corporate jet center. This FBO operates from two large conventional hangars north of the ATCT, including terminal facilities to facilitate both itinerant pilots and passengers. Sun Air also provides hangar space aircraft storage.

Sky Blue Air – Full service FBO flight training (fixed & rotor wing), avionics (sales & repair), maintenance (repair & installation), interiors (custom design & repair), aircraft sales and management, and charter operations.

Western Cardinal – Provides Shell 100LL and Jet A fuel including the self-serve fuel island and a gift shop. This FBO leases its hangar space for maintenance providers.

Aircraft Maintenance, Sales, And Service

- AVEX – Aircraft sales/brok-erage
- C & J Sales – T-28 Trojan parts/sales/service
- Camarillo Aircraft Services – Aircraft maintenance; Houses the Ventura County Sheriff's helicopter operation
- Gavin Aviation – Flight school, aircraft management, charter
- Orbic Helicopters – Robinson helicopter sales/service and flight training
- Ro-Wing Aviation – McDonnell Douglas helicopter service
- Aviation Pacific – Flight school

① Hangar 3 (Camamrillo Aircraft Services, Vent. Co. Sherif Helo)

② Channel Islands Aviation

③ Western Cardinal

④ Commemorative Air Force

⑤ Avantair

⑥ Experimental Aircraft Association

⑧ Sky Blue Air

④ Fire Station

CAMARILLO AIRPORT

Exhibit 1G
CENTRAL AND EASTERN AIRPORT FACILITIES

06MP19-1G-6/12/08

Airport Businesses

1. Hangar 3 (Camarillo Aircraft Services, Vent. Co. Sherrif Helo)*
2. Channel Islands Aviation*
3. Western Cardinal*
4. Commemorative Air Force*
5. Avantair*
6. Experimental Aircraft Association*
7. Way Point Café
8. Sky Blue Air*
9. C & J Sales

Airport Support Facilities

1. Airport Administration
2. Ventura County Dept. of Airports Fuel Farm
3. Water Storage Tank
4. Fire Station*
5. Airport Maintenance Facility
6. Water Pump and Generator Buildings

Aircraft Storage Hangars

1. Box Hangars
2. Executive Hangars
3. T-Hangars
4. Self-maintenance Hangar

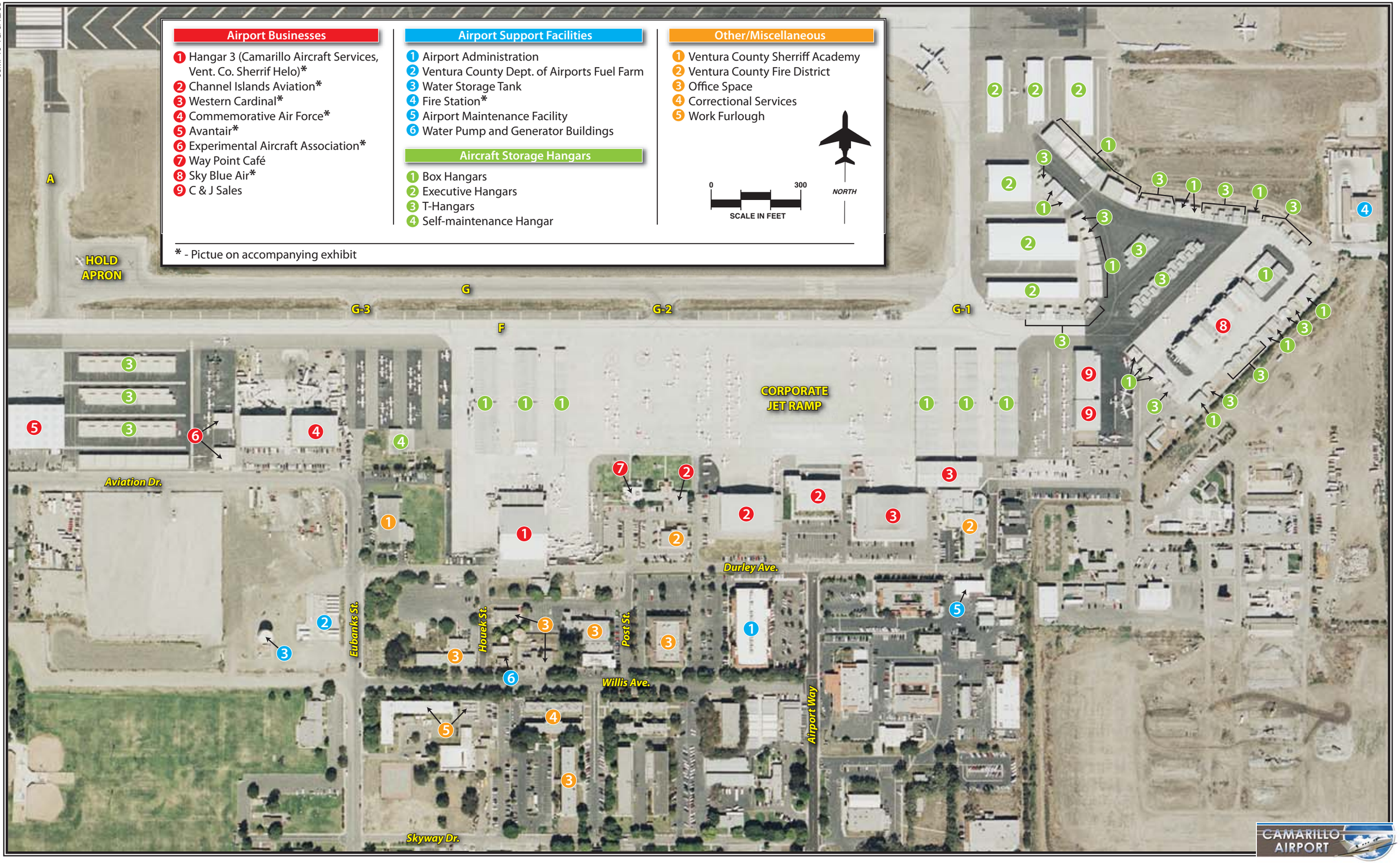
Other/Miscellaneous

1. Ventura County Sherriff Academy
2. Ventura County Fire District
3. Office Space
4. Correctional Services
5. Work Furlough

0 300
SCALE IN FEET

NORTH

* - Pictue on accompanying exhibit



CAMARILLO AIRPORT

Exhibit 1G (continued)
CENTRAL AND EASTERN AIRPORT FACILITIES

Organizations

- American Aeronautical Foundation – Restoration/operation of antique aircraft
- Civil Air Patrol – Aviation youth program and aircraft recovery
- Commemorative Air Force – Volunteer organization which restores/maintains/operates WWII aircraft; Museum
- Experimental Aircraft Association – Offers a variety of programs for aviation enthusiasts

The airport also houses several non-aviation organizations and businesses. These range from Ventura County Sheriff and Fire Department facilities, to County Youth Detention and Animal Control Divisions, to private non-aviation businesses occupying administrative spaces.

AIRCRAFT PARKING APRON

Camarillo Airport supports several areas dedicated to aircraft parking and storage. The largest contiguous apron space is located in the eastern terminal area. This apron provides approximately 45,000 square yards of pavement and providing 111 aircraft tie-down positions. A large portion of this apron is dedicated to large itinerant aircraft. Immediately south of the CAF museum, a smaller apron (approximately 8,600 square yards) provides for 36 aircraft tie-down positions. North of the CAF facility, a 3,300 square-yard (approximately) paved apron provides for eight aircraft tie-down positions. Finally, an apron immediately south of the ATCT provides for 48 aircraft tie-down positions on approximately 9,700 square yards of pavement.

Aircraft apron is also provided by several aircraft FBOs. Avantair's apron is approximately 7,100 square yards. Sun Air Jets maintains approximately 16,600 square yards of apron space, Camarillo Aircraft approximately 5,800 square yards, and Channel Islands Aviation and Western Cardinal approximately 1,700 square yards of space each.

AIRCRAFT HANGAR FACILITIES

A wide variety of hangars are available at Camarillo Airport for use in aircraft storage and repair. This includes individual enclosed T-hangars, individual Port-A-Port hangars, small clear-span hangars (executive box), and larger clear-span (conventional hangars).

Ventura County owns and operates 126 aircraft storage hangars, while 170 aircraft storage hangars are privately owned. The County hangars range in size from 800 square-foot T-hangars to 2,000 square-foot box hangars. Privately owned hangars range in size from 800 square-foot T-hangars to 2,000 square-foot box hangars. The County's hangars are leased to private individuals or companies under lease agreement. The privately owned hangars maintain a ground lease with the County. There are also large privately owned conventional hangars utilized for a variety of aviation service pro-

viders discussed in the previous section.

AUTOMOBILE PARKING

The airport supports several hundred parking spaces that support aviation businesses. Large lots are located adjacent to Western Cardinal, Waypoint Café, CAF, Avantair, and Sun Air Jets. Dedicated automobile parking is also provided to serve the non-aviation facilities and administrative office spaces, including the building which houses the Ventura County Department of Airports.

AIRCRAFT RESCUE AND FIREFIGHTING (ARFF)

The Ventura County Fire Department responds to all airport emergencies. Fire Station 50 serves the Camarillo Airport, the western portion of the City of Camarillo, and unincorporated portions of the Oxnard Plain. Situated on the airport, the station was inherited from the U.S. Air Force by the Airport Authority and leased at no cost to the fire district in exchange for fire protection on the airport. The station was originally built as a temporary building in 1954 and never updated. A new station 50 was completed in early 2001.

The Airport Fire Station is currently the district's hazardous materials response station with a unit for hazardous materials response (HazMat 4). In 2006, a Paramedic Squad with two Paramedic/Firefighters was put into service at Station 50. It is staffed daily by five firefighters and houses a pumper (Engine 50); a crash truck (Crash 50); a tractor-trailer Haz-Mat unit (Hazmat 4); a squad (Squad 50); and a pickup (Utility 50). Also housed at Station 50 are an urban search and rescue trailer with USAR supplies and two De-Con trailers used for decontamination at Haz-Mat incidents.

AIRPORT MAINTENANCE

The airport maintenance facility is located in the eastern portion of the terminal area on Durley Avenue as indicated in **Exhibit 1G**. The maintenance shop building totals approximately 4,280 square feet, while the storage yard provides another 7,500 square feet of space.

UTILITIES

The utility system at Camarillo Airport includes existing water, electric, sanitary sewer, telephone, and natural gas systems. Water and sanitary sewer services are provided by the City of Camarillo. Natural gas and electricity is provided by The Gas Company and Southern California Edison, respectively. Telephone services are provided by Verizon.

FUEL FACILITIES

The airport currently supports 12 above ground fuel storage tanks. Seven of the fuel tanks are owned by the Ventura County Department of Airports and are located in the consolidated fuel farm near the intersection

of Durley Avenue and Aviation Drive as indicated on **Exhibit 1G**. All fuel storage tanks in the fuel farm are 12,000-gallon capacity tanks: three utilized for 100LL Avgas storage and four for Jet A fuel storage. All tanks are leased to airport FBOs.

The airport also supports five additional above ground fuel storage tanks that are privately owned and maintained. Avantair maintains two storage tanks: one 20,000-gallon capacity tank for Jet A storage and a 10,000-gallon capacity tank for 100LL Avgas storage. Sun Air Jets operates three 20,000-gallon capacity above ground storage tanks for Jet A storage. The final tank is utilized for self-fueling services and is located adjacent to the ATCT.

FENCING

The perimeter fence is six feet high, chain-link topped with three-strand barbed-wire. The security fencing is also supported by pedestrian and vehicle gates. The pedestrian gates can be locked and the vehicle gates require a key pass.

ADDITIONAL AIRPORT DOCUMENTATION

The airport maintains several procedural documents which provide guidance for airport management on airport issues. The following is a brief description of the major documents.

Spill Prevention

Camarillo Airport has procedures in place to direct airport staff in case of a chemical or fuel spill. These procedures and policies are outlined in the Storm Water Pollution Prevention Program (SWPPP) document. Camarillo Airport also has an approved Spill Prevention, Control, and Countermeasure (SPCC) Plan.

14 CFR Part 150 Noise Compatibility Study

In November 1999, the airport completed a 14 CFR Part 150 Noise Compatibility Study. The results of the study provide the airport administration with guidance on how to mitigate the impacts of aircraft noise on airport neighbors. The procedures developed in this study have been advertised to the pilot community and air traffic control personnel. **Exhibit 1F** depicts the recommended traffic patterns to minimize noise impacts on neighboring noise-sensitive land uses.

Rules and Regulations

The airport maintains Minimum Operating Standards which provide rules and guidelines for commercial activity conducted on the airport by tenants. The Rules and Regulations for Camarillo Airport apply to all airport tenants for both airside and landside operations. The Minimum Operating Standards are intended to be the thre-

shold entry requirements for those wanting to provide aeronautical services to the public. Ordinance No. 4342 supplements the Minimum Operating Standards and provides operational rules and regulations. The rules set forth in the Ordinance are intended to maintain a reasonable, safe, and efficient use of the airport as well as to protect the surrounding communities and environment.

AREA LAND USE

Land uses in the vicinity of the airport can have a significant impact on airport operations and growth. The following section identifies baseline information relating to both existing and future land uses in the vicinity of Camarillo Airport. By understanding the land use issues surrounding the airport, more appropriate recommendations can be made for the future of the airport.

Land use in the vicinity of the airport is a mixture of agricultural, commercial, industrial, and open space. Most of the land to the immediate northwest, west, south and east is utilized for agricultural purposes. Industrial development is located just north of the Camarillo Hills Drain approximately midfield of the airport. To the immediate northeast, commercial uses exist at the intersection of the Ventura Freeway and Los Posas Road.

Large tracts of residential development exist to the north of Ventura Freeway including the City of Camarillo proper. A number of schools, churches, healthcare, and commercial facilities are distributed through these residential areas. **Exhibit 1H** presents the *City of Camarillo General Plan* map, while **Exhibit 1J** presents the City of Camarillo zoning map.

Height restrictions are necessary to ensure that objects will not impair flight safety or decrease the operational capability of the airport. Title 14 of the Code of Federal Regulations (CFR) Part 77, *Objects Affecting Navigable Airspace*, defines a series of imaginary surfaces surrounding airports. The imaginary surfaces consist of the approach zone, conical zones, transitional zones, and horizontal zones. Objects such as trees, towers, buildings, or roads, which penetrate any of these surfaces, are considered by the FAA to be an obstruction to air navigation. Current City of Camarillo zoning and land use ordinances adhere to and support the height restriction guidelines as set forth in 14 CFR Part 77. Height restrictions can be accomplished through height and hazard zoning, avigation easements, or fee simple acquisition.

VENTURA COUNTY AIRPORT LAND USE COMPATIBILITY PLAN

Airport land use commissions (ALUCs) were first established under the *California State Aeronautics Act* in 1967. Although the law has been amended numerous times since then, the fundamental purpose of ALUCs to promote land use compatibility around airports has remained unchanged.

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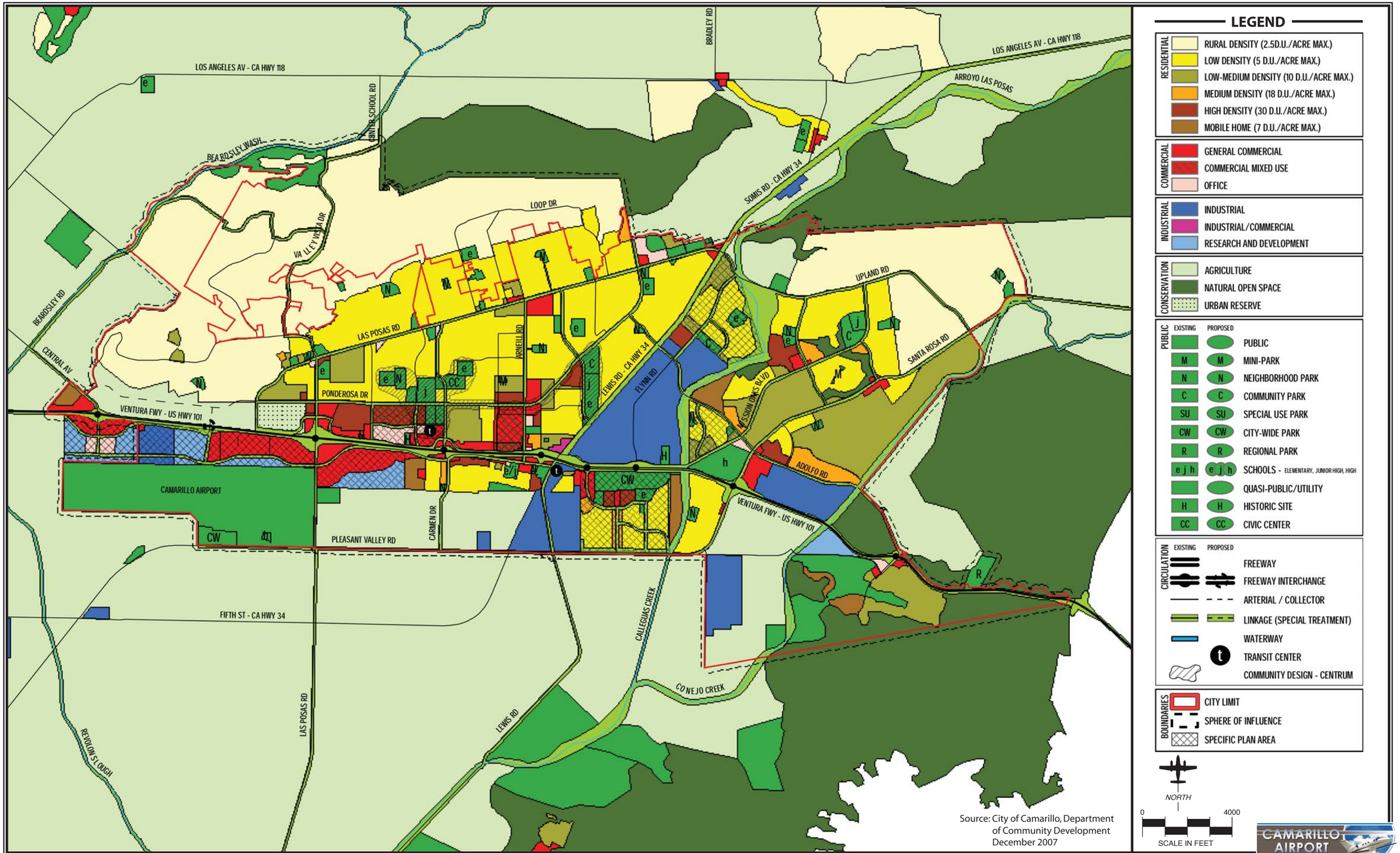


LEGEND

RESIDENTIAL
- RURAL DENSITY (2.5D.U./ACRE MAX.)
- LOW DENSITY (5 D.U./ACRE MAX.)
- LOW-MEDIUM DENSITY (10 D.U./ACRE MAX.)
- MEDIUM DENSITY (18 D.U./ACRE MAX.)
- HIGH DENSITY (30 D.U./ACRE MAX.)
- MOBILE HOME (7 D.U./ACRE MAX.)

COMMERCIAL
- GENERAL COMMERCIAL
- COMMERCIAL MIXED USE
- OFFICE

INDUSTRIAL
- INDUSTRIAL
- INDUSTRIAL/COMMERCIAL
- RESEARCH AND DEVELOPMENT

CONSERVATION
- AGRICULTURE
- NATURAL OPEN SPACE
- URBAN RESERVE

PUBLIC

EXISTING	PROPOSED	
		PUBLIC
M	M	MINI-PARK
N	N	NEIGHBORHOOD PARK
C	C	COMMUNITY PARK
SU	SU	SPECIAL USE PARK
CW	CW	CITY-WIDE PARK
R	R	REGIONAL PARK
e j h	e j h	SCHOOLS - ELEMENTARY, JUNIOR HIGH, HIGH
		QUASI-PUBLIC/UTILITY
H	H	HISTORIC SITE
CC	CC	CIVIC CENTER

CIRCULATION

EXISTING	PROPOSED	
		FREEWAY
		FREEWAY INTERCHANGE
		ARTERIAL / COLLECTOR
		LINKAGE (SPECIAL TREATMENT)
		WATERWAY
t	t	TRANSIT CENTER
		COMMUNITY DESIGN - CENTRUM

BOUNDARIES
- CITY LIMIT
- SPHERE OF INFLUENCE
- SPECIFIC PLAN AREA

NORTH

0 4000

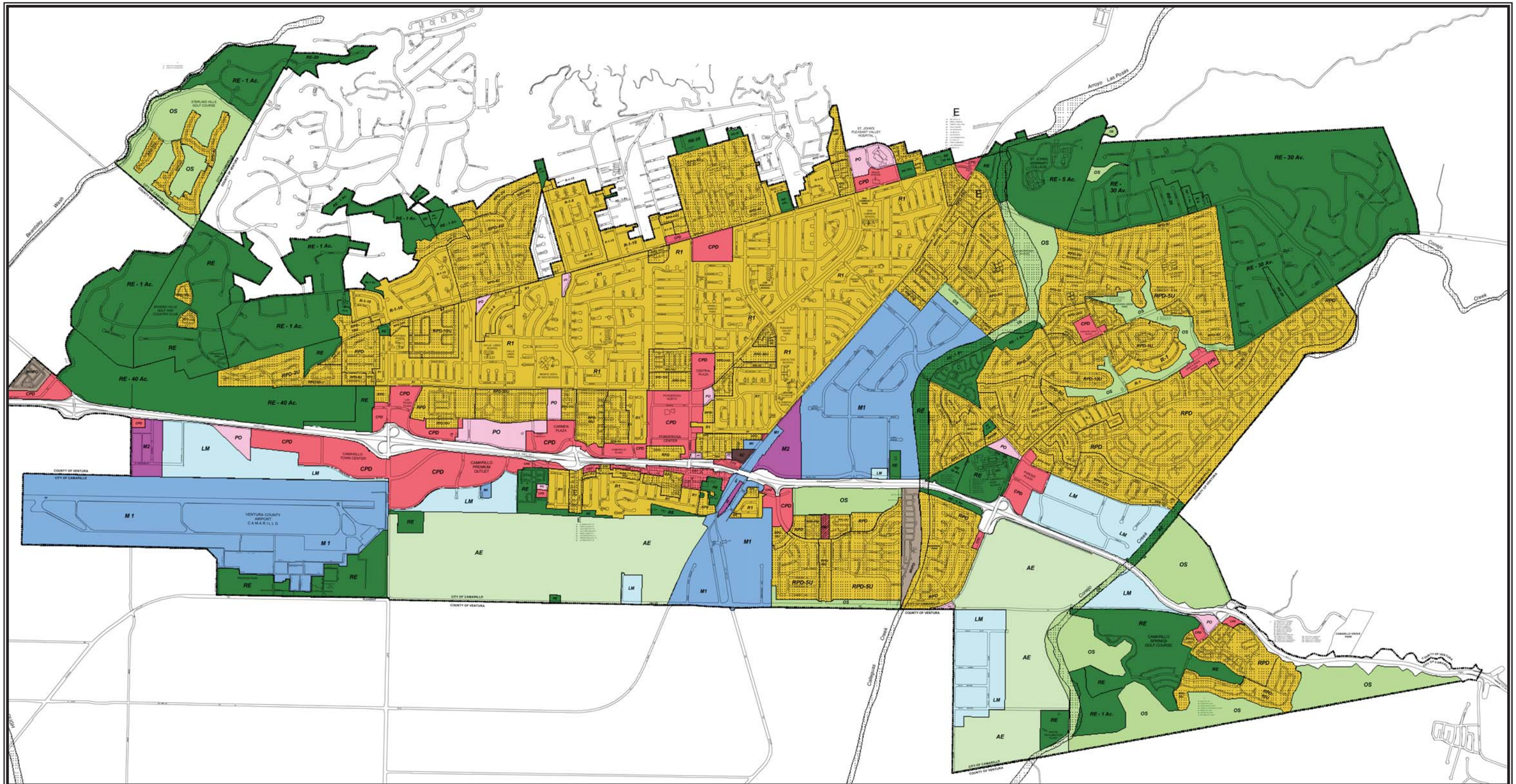
SCALE IN FEET

Source: City of Camarillo, Department of Community Development December 2007

CAMARILLO AIRPORT

Exhibit 1H
CITY OF CAMARILLO GENERAL PLAN

06MP19-1J-6/12/08



LEGEND

RESIDENTIAL & AGRICULTURE

AE	AGRICULTURAL EXCLUSIVE
RE	RURAL EXCLUSIVE
R1	SINGLE FAMILY RESIDENTIAL
RPD	RESIDENTIAL PLANNED DEVELOPMENT
MHPD	MOBILE HOME PARK DEVELOPMENT

COMMERCIAL

RC	RECREATION COMMERCIAL
PO	PROFESSIONAL OFFICE
CN	COMMERCIAL NEIGHBORHOOD
CPD	COMMERCIAL PLANNED DEVELOPMENT
COT	COMMERCIAL OLD TOWN
CMU	COMMERCIAL MIXED USE
SC	SERVICE COMMERCIAL

INDUSTRIAL

LM	LIMITED MANUFACTURING
M-1	LIGHT MANUFACTURING
M-2	GENERAL MANUFACTURING

OPEN SPACE

OS	OPEN SPACE

NORTH

0 3000

SCALE IN FEET

Source: City of Camarillo Geographic Information System, December 5, 2007

CAMARILLO AIRPORT

Exhibit 1J

CITY OF CAMARILLO ZONING MAP

The statute gives ALUCs two principal powers by which to accomplish this objective. First, ALUCs must prepare and adopt an airport land use compatibility plan. Secondly, they must review the plans, regulations, and other actions of local agencies and airport operators for consistency with that plan.

The ALUCs are somewhat limited in their enforcement power. The statute specifically says that ALUCs have no authority over either existing land uses or the operation of airports. Local general plans are the primary mechanism for implementing the compatibility policies set forth in the ALUC's plan. State law allows for the county board of supervisors to designate an existing body to fulfill the role of the ALUC instead of creating an entirely new entity. The VCTC has been designated by the Board of Supervisors to act as the ALUC for the County.

On July 7, 2000, the VCTC adopted the *Airport Comprehensive Land Use Plan for Ventura County* (ACLUP). The ACLUP included the four airports located in the County. **Exhibit 1K** presents the approved compatibility map associated with Camarillo Airport. This map and the recommendations for land use compatibility have subsequently been included in the City of Camarillo Zoning Code (Article VI, Chapter 19.170, *Airport Protection Overlay Zone [AP]*) as of March 2006.

The compatibility map defines several zones and provides recommended land uses. A summary of the recommended land uses by zones are as follows:

- Runway Protection Zone (RPZ) – should be free of any land uses that will generate congregations of people on the ground. Unacceptable uses include residential, public/institutional, commercial, industrial (except utilities and automobile parking), and recreation/open space (with the exception of golf courses).

- Outer Safety Zone (OSZ) – Roughly corresponds to the 14 CFR Part 77 approach surface extending between the RPZ and the base of the 14 CFR Part 77 horizontal surface. The size of this area will differ based on the type(s) of instrument approach(es) and local operating procedures. For example, the Camarillo OSZ was enlarged to cover the area beneath a commonly used right turning flight track on Runway 26 departures. Residential and public/institutional uses are unacceptable in the OSZ. Some commercial, industrial, transportation, communication, utilities, recreation/open space uses are conditionally acceptable pursuant to meeting specific guidelines. Conditionally acceptable uses should have avigation easements and fair disclosure agreements.

- Traffic Pattern Zone (TPZ) – Roughly rectangular area centered on the airport. It is an area commonly traversed by low altitude aircraft overflights and touch-and-go traffic in the pattern. At Camarillo, the TPZ extends 3,400 feet to either side of the runway. Most land uses are conditionally accept

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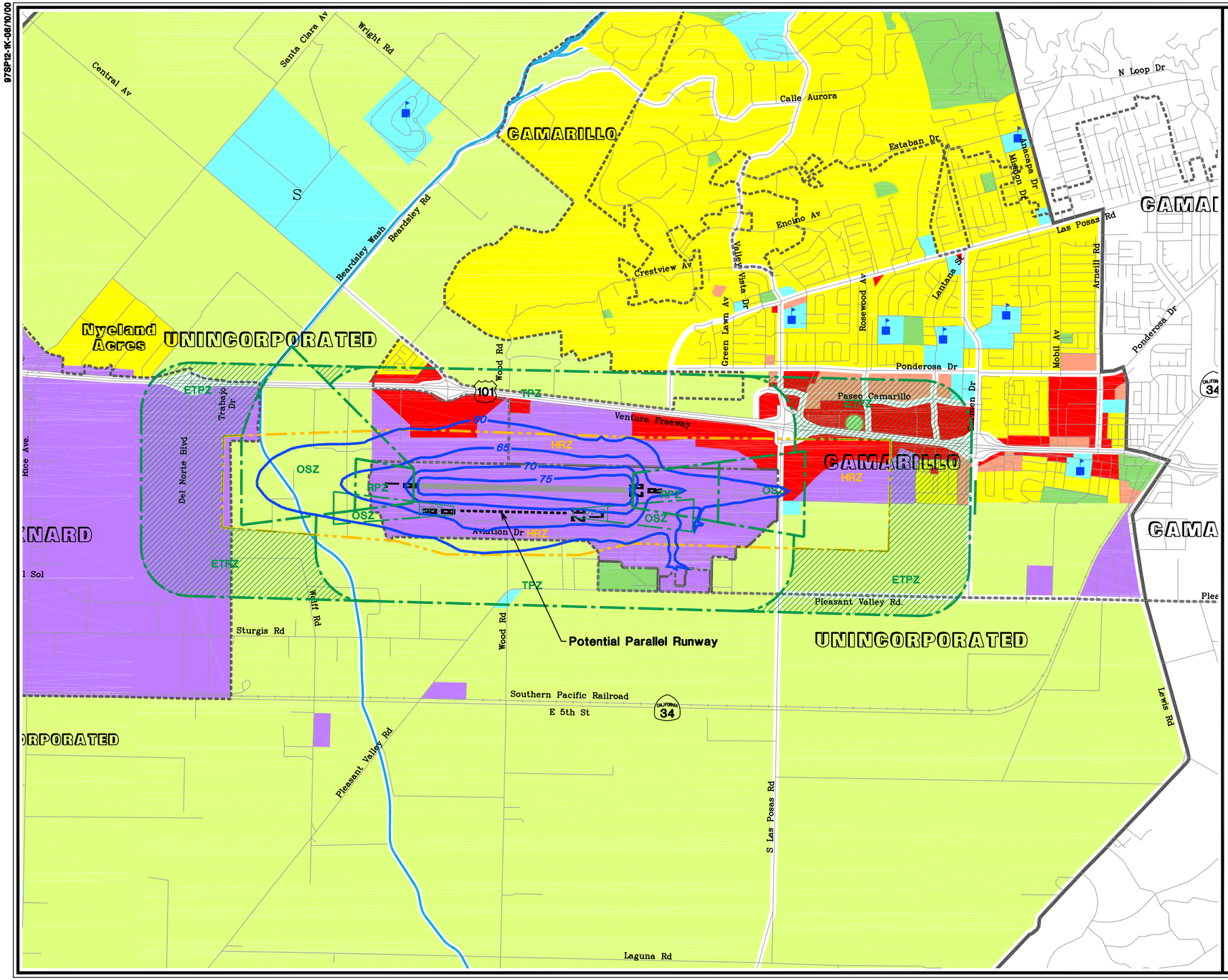

LEGEND

- Detailed Land Use Study Area
- Municipal Boundary
- Airport Property
- Potential Parallel Runway •
- Composite CNEL Contour (2003,2018)
- RPZ — Runway Protection Zone
- OSZ — Outer Safety Zone
- HRZ — Height Restriction Zone
- TPZ — Traffic Pattern Zone
- ETPZ — Extended Traffic Pattern Zone

Future Land Use Per General Plan

- Low Density Residential
- Medium/High Density Residential
- Commercial
- Industrial
- Agriculture
- Parks/Natural Open Space
- Public/Quasi-Public
- Schools
- S — Future School Site

Source: Future land use from City of Camarillo, 1996, City of Oxnard, 1990.

• The parallel runway is being included in the CLUP for information purposes only.

NORTH

0 3000

SCALE IN FEET

CAMARILLO AIRPORT

Exhibit 1K
ADOPTED AIRPORT COMPREHENSIVE LAND USE PLAN FOR CAMARILLO AIRPORT

able in the TPZ including residential, commercial, and industrial uses; whereas, some uses are fully acceptable including transportation terminals, utilities, automobile parking, and most outdoor recreational/open space uses with the exception of those creating large gatherings of the public (sports arenas, amphitheatres, etc.). Public/institutional uses are unacceptable in the TPZ. Conditionally acceptable uses should have avigation easements and fair disclosure agreements.

- Extended Traffic Pattern Zone (ETPZ) – Based on the area which is beneath the extended traffic pattern on a typical or average busy day at the airport. All land uses are acceptable in the ETPZ; however, some uses are conditionally acceptable. Conditionally acceptable uses should have avigation easements and fair disclosure agreements.

SOCIOECONOMIC CHARACTERISTICS

A variety of historical and forecast socioeconomic data, related to the regional area, has been collected for use in various elements of this master plan. This information provides essential background for use in determining aviation service level requirements. Aviation forecasts are often related to the population base, economic strength of a region, and the ability of a region to sustain a strong economic base over an extended period of time.

POPULATION

Historical population data for Ventura County and its entities, as well as the State of California, are presented in **Table 1G**. As shown in the table, the population of the City of Camarillo, Ventura County, and the State of California have increased at very similar average annual growth rates (AAGR). Over the last 18 years, Ventura County resident population has experienced an AAGR of 1.22 percent increasing by 162,571. Over the same period, the City of Camarillo's population increased by 13,156 residents which yields an AAGR of 1.25 percent.

EMPLOYMENT

Analysis of a community=s employment base can be valuable in determining the overall well-being of that community. In most cases, the community=s make-up and health is significantly determined by the availability of jobs, the variety of employment opportunities, and the types of wages provided by local employers. A breakdown of historical employment data for Ventura County is presented in **Table 1H**.

TABLE 1G
Historical Population

LOCATION	1990	1995	2000	2005	2008	AAGR
Ventura County Localities						
Camarillo	52,297	54,233	57,084	62,449	65,453	1.25%
Fillmore	11,992	12,779	13,643	15,130	15,641	1.49%
Moorpark	25,494	27,768	31,415	35,595	36,814	2.06%
Ojai	7,613	7,806	7,862	8,104	8,156	0.38%
Oxnard	142,560	155,704	170,358	187,691	194,905	1.75%
Port Hueneme	20,322	20,573	21,845	22,566	22,202	0.49%
San Buenaventura	92,557	97,393	100,916	105,454	108,261	0.87%
Santa Paula	25,062	27,186	28,598	29,099	29,539	0.92%
Simi Valley	100,218	100,453	111,351	120,678	125,657	1.26%
Thousand Oaks	104,381	108,303	117,005	126,337	128,650	1.17%
Unincorporated	86,520	90,632	93,120	96,127	96,309	0.60%
County Total	669,016	702,830	753,197	809,230	831,587	1.22%
State of California	29,758,213	31,617,770	33,873,086	36,675,346	38,049,462	1.37%

Source: U.S. Census; California Department of Finance

TABLE 1H
Ventura County Employment by Industry Sector

INDUSTRY	2002	2003	2004	2005	2006	AAGR
Farm employment	15,353	16,665	16,424	15,759	14,975	-0.62%
Forestry, fishing, and other	9,900	9,362	8,512	8,502	8,572	-3.54%
Mining	1,11	1,061	1,090	1,280	1,491	7.46%
Utilities	906	1,003	1,008	1,027	1,058	3.95%
Construction	23,020	24,178	24,565	26,803	28,989	5.93%
Manufacturing	40,290	39,411	40,914	40,750	41,037	0.46%
Wholesale trade	14,118	14,289	14,767	15,390	15,821	2.89%
Retail trade	44,669	45,424	45,743	46,953	47,993	1.81%
Transportation and warehousing	6,732	6,555	6,041	6,044	6,419	-1.18%
Information Technologies	9,027	8,415	8,221	7,902	8,008	-2.95%
Finance and insurance	25,026	26,816	25,169	26,308	25,904	0.87%
Real estate and rental and leasing	17,065	18,593	19,226	20,387	22,235	6.84%
Professional and technical services	28,353	28,405	28,631	30,337	31,792	2.90%
Management of companies/enterprises	3,555	4,082	5,925	5,427	4,955	8.66%
Administrative and waste services	28,180	27,737	26,436	25,751	25,306	-2.65%
Educational services	5,012	5,586	5,900	6,107	6,269	5.75%
Health care and social assistance	29,786	31,648	30,904	31,226	31,867	1.70%
Arts, entertainment, and recreation	9,024	9,443	9,529	9,493	9,992	2.58%
Accommodation and food services	26,442	25,820	26,202	26,769	27,515	1.00%
Other services, except public admin.	23,849	24,373	23,648	23,608	24,144	0.31%
Government and government enterprises	51,568	52,623	51,424	50,437	50,173	-0.68%

Source: Regional Economic Information System, Bureau of Economic Analysis, U.S. Department of Commerce

As indicated in the table, the various service industries present the largest employment opportunities in the county, followed by the government, retail trade, and manufacturing industries. The greatest increases in activity during the five-year period measured by AAGR were experienced in the

management, educational services, construction, and real estate sectors. Six industry sectors experienced negative growth over the period, including farm, forestry, transportation/warehousing, information technologies, administrative/waste services, and government. Overall, the county has experienced strong growth in the majority of the industries.

Table 1J summarizes labor force data for Ventura County. As shown in the table, the labor force available in Ventura County increased by 25,600 persons from 1990 to 2000. In the 2000s, however, the labor force increased by 100,200 between 2000 and 2007.

During that same time period, the unemployment rate increased by 1.60 percent from 1990 to 1995, but then decreased nearly 3.0 percent by 2000 to a level below that reported in 1990. In 2007, the unemployment rate was 0.5 percent higher than 2000.

TABLE 1J
Labor Force Data and Economic Indicators
Ventura County

	1990	1995	2000	2005	2007
Labor Force Data					
Civilian Labor Force	366,800	379,300	392,400	420,400	492,600
Unemployment	21,200	28,200	17,700	20,100	21,300
Unemployment Rate	5.80%	7.40%	4.50%	4.80%	5.00%

Source: California Economic Development Department

ENVIRONMENTAL INVENTORY

The protection and preservation of the local environment are essential concerns for the master planning process. An inventory of potential environmental sensitivities that might affect future improvements at the Airport has been completed to ensure proper consideration of the environment through the planning process. Available information about existing environmental conditions at Camarillo Airport has been derived from a variety of internet resources, agency maps, and existing literature.

WETLANDS

The U.S. Army Corps of Engineers (USACE) regulates the discharge of dredge and/or fill material into waters of the United States, including adjacent wetlands, under Section 404 of the *Clean Water Act*.

Wetlands are defined by Executive Order 11990, *Protection of Wetlands*, as "those areas that are inundated by surface or groundwater with a frequency sufficient to support and under normal circumstances does or would support a prevalence of vegetation or aquatic life that requires saturated or

seasonally saturated soil conditions for growth and reproduction." Categories of wetlands includes swamps, marshes, bogs, sloughs, potholes, wet meadows, river overflows, mud flats, natural ponds, estuarine area, tidal overflows, and shallow lakes and ponds with emergent vegetation. Wetlands exhibit three characteristics: hydrology, hydrophytes (plants able to tolerate various degrees of flooding or frequent saturation), and poorly drained soils.

Based on a review of the United States Geologic Survey (USGS) topographic map that includes the airport and surrounding areas and previous environmental documentation undertaken for the airport, there are no streams, watercourses, tributaries, or wetlands on airport property.

FLOODPLAINS

As defined in FAA Order 1050.1E, floodplains consist of "lowland and relatively flat areas adjoining inland and coastal water including flood prone areas of offshore islands, including at a minimum, that area subject to one percent or greater chance of flooding in any given year." Federal agencies are directed to take action to reduce the risk of flood loss, minimize the impact of floods on human safety, health and welfare, and restore and preserve the natural and beneficial values served by floodplains. Floodplains have natural and beneficial values, such as providing ground water recharge, water quality maintenance, fish, wildlife, plants, open space, natural beauty, outdoor recreation, agriculture, and forestry. FAA Order 1050.1E (12) (c) indicates that "if the proposed action and reasonable alternatives are not within the limits of a base floodplain (100-year flood area)," that it may be assumed that there are no floodplain impacts. The limits of base floodplains are determined by Flood Insurance Rate Maps (FIRM) prepared by the Federal Emergency Management Agency (FEMA).

According to the FIRM map, portions of Camarillo Airport are contained within the 100-year floodplain associated with the Camarillo Hills Drain.

WATER SUPPLY AND QUALITY

Camarillo Airport is located within the Los Angeles Region (Region 4) of the California Regional Water Quality Control Board (RWQCB). The RWQCB issues Federal National Pollutant Discharge Elimination System (NPDES) permits for discharge to surface waters. The City of Camarillo requires compliance with NPDES requirements and enforces compliance under the RWQCB NPDES permit number CA0053597 which includes Best Management Practices (BMPs) which are specific to the Calleguas Creek watershed. This permitting process provides a mechanism to require the implementation of controls designed to prevent harmful pollutants from being washed by stormwater runoff into local water bodies.

Potable water is supplied by the City of Camarillo. Sewage treatment services are provided by the City of Camarillo. The airport operates in con-

formance with Section 402(p) of the *Clean Water Act*. Ventura County holds an NPDES Multi-Sector General Permit for stormwater discharges associated with industrial activity and maintains a *Stormwater Pollution Prevention Plan* (SWPPP) in accordance with Environmental Protection Agency (EPA) regulations.

BIOTIC RESOURCES

Biotic resources refer to those flora and fauna (i.e., vegetation and wildlife) habitats which are present in an area. Impacts to biotic communities are determined based on whether a proposal would cause a minor permanent alteration of existing habitat or whether it would involve the removal of a sizable amount of habitat, habitat which supports a rare species, or a small, sensitive tract.

Table 1K depicts federally listed threatened and endangered species and species of special concern listed for Ventura County.

Camarillo Airport is located in an area that includes urbanized disturbed lands that are routinely maintained and agricultural areas that have reduced the use of the area as a significant habitat. No known habitat for species of concern is located on airport property. According to the California Natural Diversity Database (as of May 2008), no state or federally listed species have been identified on, or in the vicinity of, airport property.

AIR QUALITY

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

Primary air quality standards are established at levels to protect the public health and welfare from any known or anticipated adverse effects of a pollutant. All areas of the country are required to demonstrate attainment with NAAQS.

Air contaminants increase the aggravation and the production of respiratory and cardiopulmonary diseases. The standards also establish the level of air quality which is necessary to protect the public health and welfare, including among other things, effects on crops, vegetation, wildlife, visibility, and climate, as well as effects on materials, economic values, and on personal comfort and well-being.

According to the Environmental Protection Agency's "Green book," Ventura County is classified as moderate non-attainment for 8-hour ozone.

TABLE 1K
Threatened and Endangered Species
Ventura County, California

COMMON NAME	SCIENTIFIC NAME	STATUS
Plants		
Hoffmann's rock cress	Arabis hoffmannii	Endangered
Braunton's milk-vetch	Astragalus brauntonii	Endangered
Ventura Marsh milk-vetch	Astragalus pycnostachyus var. lanosissimus	Endangered
Island barberry	Berberis pinnata ssp. Insularis	Endangered
SAlt marsh bird's-beak	Cordylanthus maritimus ssp. Maritimus	Endangered
Island malacothrix	Malacothrix squalida	Endangered
California Orcutt grass	Orcuttia californica	Endangered
Lyon's pentachaeta	Pentachaeta lyonii	Endangered
Agoura Hills dudleya	Dudleya cymosa ssp. Agourensis	Threatened
Marcescent dudleya	Dudleya cymosa ssp. Marcescens	Threatened
Conejo dudleya	Dudleya parva	Threatened
Verity's dudleya	Dudleya verityi	Threatened
Insects		
Kern primrose sphinx moth	Euproserpinus euterpe	Threatened
Invertebrates		
Riverside fairy shrimp	Streptocephalus woottoni	Endangered
Vernal pool fairy shrimp	Branchinecta lynchi	Threatened
Fish		
Southern steelhead - southern California ESU	Oncorhynchus mykiss irideus	Endangered
Tidewater goby	Eucyclogobius newberryi	Endangered
Unarmored threespine stickle-back	Gasterosteus aculeatus williamsoni	Endangered
Santa Ana sucker	Catostomus santaanae	Threatened
Amphibians		
Arroyo toad	Bufo californicus	Endangered
Sierra Madre yellow-legged frog	Rana muscosa	Endangered
California red-legged frog	Rana draytonii	Threatened
Reptiles		
Blunt-nosed leopard lizard	Gambelia sila	Endangered
Island night lizard	Xantusia riversiana	Threatened
Bird		
California condor	Gymnogyps californianus	Endangered
California brown pelican	Pelecanus occidentalis californicus	Endangered
Light-footed clapper rail	Rallus longirostris levipes	Endangered
California least tern	Sternula antillarum browni	Endangered
Least Bell's vireo	Vireo bellii pusillus	Endangered
Western snowy plover	Charadrius alexandrinus nivosus	Threatened
Coastal California gnatcatcher	Polioptila californica californica	Threatened
Mammals		
Guadalupe fur-seal	Arctocephalus townsendi	Threatened
Southern sea otter	Enhydra lutris nereis	Threatened

Source: US Fish and Wildlife Service, Ventura County Species List

FARMLAND

The *Farmland Protection Policy Act* (FPPA) was enacted to preserve farmland. FPPA guidelines apply to farmland classified as prime or unique, or of state or local importance as determined by the appropriate government agency, with concurrence by the Secretary of Agriculture. Areas west and south of the airport are used for agricultural purposes. Based on an evaluation of data available from the United States Department of Agriculture's National Resource Conservation Service, there are five soil types within the immediate vicinity of the airport. Three of the soil types are considered farmlands of statewide importance, one is classified as a prime farmland if irrigated, and one is considered a prime farmland if irrigated and drained.

ENVIRONMENTAL JUSTICE

Environmental Justice Impacts occur when disproportionately high and adverse human health or environmental effects occur to minority and low-income populations

According to the EPA EnviroMapper tool, the Census Blocks immediately surrounding the airport includes a high percentage (greater than 40 percent) minority population. There are also several Census Blocks directly to the south and west of the airport that have a very low (less than 10 percent) percentage minority population. Additionally, the EnviroMapper tool indicates that the Census Blockgroup containing the airport has a low (10 to 20 percent) percentage of minority population. The Blockgroup directly north of the airport has a very low (less than 10 percent) percentage of minority population.

DEPARTMENT OF TRANSPORTAION ACT: SECTION 4(f)

These include publicly owned land from a public park, recreation area, or wildlife and waterfowl refuge of national, state, or local significance, or any land from a historic site of national, state, or local significance.

Potential Section 4(f) properties located in proximity to the airport include Freedom Park, located south of the airport and Spanish Hills Park and Springville Park, both located approximately one mile north of the airport.

HISTORICAL AND CULTURAL RESOURCES

According to previous environmental documentation prepared for the airport, no historic, archaeological, or cultural resources have been identified at the airport. Additional coordination with the South Central Coastal Information Center indicated that there are no properties listed on the National Register of Historic Places within the vicinity of the airport.

SUMMARY

The information discussed in this inventory chapter provides a foundation upon which the remaining elements of the planning process will be constructed. Information on current airport facilities and utilization will serve as a basis, with additional analysis and data collection, for the development of forecasts of aviation activity and facility requirement determinations.

DOCUMENT SOURCES

As mentioned earlier, a variety of different sources were utilized in the inventory process. The following listing reflects a partial compilation of these sources. This does not include data provided by airport management as part of their records, nor does it include airport drawings and photographs which were referenced for information. On-site inventory and interviews with staff and tenants contributed to the inventory effort.

Airport/Facility Directory, Southwest, U.S. Department of Transportation, Federal Aviation Administration, National Aeronautical Charting Office.

Los Angeles Sectional Aeronautical Chart, U.S. Department of Transportation, Federal Aviation Administration, National Aeronautical Charting Office.

National Plan of Integrated Airport Systems (NPIAS), U.S. Department of Transportation, Federal Aviation Administration, 2007-2011.

U.S. Terminal Procedures, Southwest, U.S. Department of Transportation, Federal Aviation Administration, National Aeronautical Charting Office.

California Aviation System Plan, 2003.

Camarillo Airport Master Plan, 1996.

Camarillo 14 CFR Part 150 Study 1999.

Camarillo Environmental Impact Report (EIR) 1999; Addendum 2003.

Southern California Association of Governments General Aviation Study, 2003.

Camarillo General Plan. City of Camarillo.

A number of internet Web sites were also used to collect information for the inventory chapter. These include the following:

FAA 5010 Airport Master Record Data:
www.airnav.com

Southern California Association of Governments
www.scag.ca.gov

U.S. Census Bureau:
www.census.gov

The City of Camarillo, California
www.ci.camarillo.ca.us/

Ventura County, California
http://portal.countyofventura.org

California Employment Development Department
http://wwwedd.cahwnet.gov/

California Department of Finance
http://www.dof.ca.gov/Research/Research.asp

California Department of Transportation (Caltrans)
http://www.dot.ca.gov/

Bureau of Economic Analysis, U.S. Department of Commerce
http://www.bea.gov/bea/regional/data.htm

CHAPTER TWO

AVIATION DEMAND FORECASTS

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AVIATION DEMAND FORECASTS

A very important factor in facility planning involves a definition of demand that may reasonably be expected to occur during the useful life of the facility's key components. In airport master planning, this involves projecting potential aviation activity for a twenty-year timeframe. In fact, only two components of a master plan are actually approved by the Federal Aviation Administration (FAA), the forecasts and the airport layout plan (ALP) drawing set. The ALP set will be developed later in the study.

The FAA has oversight responsibility to review and approve aviation forecasts developed in conjunction with airport planning studies. The FAA reviews such forecasts with the objective of comparing them to its Terminal Area Forecasts (TAF) and the National Plan of Integrated Airport Systems (NPIAS). In addition, aviation activity forecasts are an important input to the benefit-cost analyses associated with airport development, and FAA reviews these analyses when federal funding requests are submitted.

As stated in FAA Order 5090.3C, Field Formulation of the National Plan of Integrated Airport Systems (NPIAS), dated December 4, 2004, forecasts should:

- Be realistic
- Be based on the latest available data
- Reflect current conditions at the airport
- Be supported by information in the study
- Provide adequate justification for airport planning and development

The forecast process for an airport master plan consists of a series of basic

steps that can vary depending upon the issues to be addressed and the level of effort required to develop the forecast. The steps include a review of previous forecasts, determination of data needs, identification of data sources, collection of data, selection of forecast methods, preparation of the forecasts, and evaluation and documentation of the results.

The following forecast analysis for Camarillo Airport (CMA) was produced following these basic guidelines. Forecasts dating back to the previous master plan are examined and compared against current and historic activity. The historical aviation activity is then examined along with other factors and trends that can affect demand. The intent is to provide an updated set of aviation-demand projections for CMA that will permit Ventura County to make planning adjustments as necessary to maintain a viable, efficient, and cost-effective facility.

NATIONAL AVIATION TRENDS

Each year, the FAA publishes its national forecast. Included in this publication are forecasts for large air carriers, regional air carriers, general aviation, and FAA workload measures. 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 when this chapter was prepared was *FAA Aerospace Forecasts - Fiscal Years 2008-2025*, published in March 2008. The forecasts use the economic performance of the United States as an indicator of future aviation industry growth. Similar economic analyses are applied to the outlook for aviation growth in international markets.

In the seven years prior to 2001, the U.S. civil aviation industry experienced unprecedented growth in demand and profits. The impacts to the economy and the aviation industry from the events of 9/11 were immediate and significant. The economy and the aviation industry recovered in the years following 9/11; however, recent trends indicate a slowing in both economic and aviation-related indicators.

The Office of Management and Budget (OMB) expects the U.S. economy to continue to grow in terms of Gross Domestic Product (GDP) at an average annual rate of 2.7 percent through 2025. If this growth is realized, the aviation industry will follow, leading to passenger, air cargo, and general aviation growth throughout the forecast period (assuming there will be no new successful terrorists incidents against either U.S. or world aviation). The primary concern in the short term, however, is the rapidly rising fuel costs. High fuel costs have negatively influenced the aviation industry over the last year and will likely continue until they stabilize or return to normalcy.

GENERAL AVIATION TRENDS

In the 14 years since the passage of the *General Aviation Revitalization Act of 1994* (federal legislation which limits the liability on general aviation aircraft to 18 years from the date of manufac-

ture), it is clear that the Act has successfully infused new life into the general aviation industry. This legislation sparked an interest to renew the manufacturing of general aviation aircraft due to the reduction in product liability, as well as renewed optimism for the industry.

After the passage of this legislation, annual shipments of new aircraft rose every year between 1994 and 2000. According to the General Aviation Manufacturers Association (GAMA), between 1994 and 2000, general aviation aircraft shipments increased at an average annual rate of more than 20 percent, increasing from 928 shipments in 1994 to 3,140 shipments in 2000. As shown in **Table 2A**, the growth in the general aviation industry slowed considerably after 2000, negatively impacted by the national economic recession and the events surrounding 9/11. In 2003, there were over 450 fewer aircraft shipments than in 2000, a decline of 14 percent.

TABLE 2A
Annual General Aviation Airplane Shipments
Manufactured Worldwide and Factory Net Billings

Year	Total	SEP	MEP	TP	J	Net Billings ($ millions)
2000	3,140	1,862	103	415	760	13,497.0
2001	2,994	1,644	147	421	782	13,866.6
2002	2,687	1,601	130	280	676	11,823.1
2003	2,686	1,825	71	272	518	9,994.8
2004	2,963	1,999	52	321	591	11,903.8
2005	3,580	2,326	139	365	750	15,140.0
2006	4,042	2,508	242	407	885	18,793.0

SEP - Single Engine Piston; MEP - Multi Engine Piston; TP - Turboprop; J - Turbofan/Turbojet

Source: GAMA (Note: 2007 figures not available)

In 2004, the general aviation production showed a significant increase, returning to near pre-9/11 levels for most indicators. With the exception of multi-engine piston aircraft deliveries, deliveries of new aircraft in all categories increased. In 2006, total aircraft deliveries increased 12 percent. The largest increase was in single engine piston aircraft deliveries that increased seven percent or by over 180 aircraft. Turbojet and multi engine piston aircraft also increased significantly from the previous year. As evidenced in the table, new aircraft deliveries in 2006 exceed pre-9/11 levels by approximately 1,000 aircraft.

On July 21, 2004, the FAA published the final rule for sport aircraft: The *Certification of Aircraft and Airmen for the Operation of Light-Sport Aircraft* rules, which went into effect on September 1, 2004. This final rule establishes new light-sport aircraft categories and allows aircraft manufacturers to build and sell completed aircraft without obtaining type and production certificates. Instead, aircraft manufacturers will build to industry consensus standards.

This reduces development costs and subsequent aircraft acquisition costs. This new category places specific conditions on the design of the aircraft, to limit them to "slow (less than 120 knots maximum) and simple" performance aircraft. New pilot training times are reduced and offer more flexibility in the type of aircraft the pilot would be allowed to operate.

Viewed by many within the general aviation industry as a revolutionary change in the regulation of recreational aircraft, this new rule is anticipated to significantly increase access to general aviation by reducing the time required to earn a pilot's license and the cost of owning and operating an aircraft. Since 2004, there have been over 30 new product offerings in this airplane category alone. These regulations are aimed primarily at the recreational aircraft owner/operator. By 2025, there are expected to be 14,700 of these aircraft in the national fleet.

While impacting aircraft production and delivery, the events of 9/11 and the subsequent economic downturn have not had the same negative impact on the business/corporate side of general aviation. The increased security measures placed on commercial flights have increased interest in fractional and corporate aircraft ownership, as well as on-demand charter flights. According to GAMA, the total number of corporate operators increased by approximately 2,300 between 2000 and 2006. Corporate operators are defined as those companies that have their own flight departments and utilize general aviation aircraft to enhance productivity. **Table 2B** summarizes the number of U.S. companies operating fixed-wing turbine aircraft between 1991 and 2006.

TABLE 2B
U.S. Companies Operating Fixed-Wing Turbine Business Aircraft and Number of Aircraft, 1991-2005

Year	Number of Operators	Number of Aircraft
1991	6,584	9,504
1992	6,492	9,504
1993	6,747	9,594
1994	6,869	10,044
1995	7,126	10,321
1996	7,406	11,285
1997	7,805	11,774
1998	8,236	12,425
1999	8,778	13,148
2000	9,317	14,079
2001	9,709	14,837
2002	10,191	15,569
2003	10,661	15,870
2004	10,735	16,369
2005	10,809	16,867
2006	11,611	16,965

Source: GAMA/NBAA

The growth in corporate operators comes at a time when fractional aircraft programs are experiencing significant growth. Fractional ownership programs sell a share in an aircraft at a fixed cost. This cost, plus monthly maintenance fees, allows the shareholder a set number of hours of use per year and provides for the management and pilot services associated with the aircraft's operation. These programs guarantee the aircraft is available at any time, with short notice. Fractional ownership programs offer the shareholder a more efficient use of time (when compared with commercial air service) by providing faster point-to-point travel times and the ability to conduct business confidentially while flying. The lower initial startup costs (when compared with acquiring and establishing a flight department) and easier exiting options are also positive benefits.

Since beginning in 1986, fractional jet programs have flourished. **Table 2C** summarizes the growth in fractional shares between 1986 and 2006. The number of aircraft in fractional jet programs grew rapidly from 2001 to 2006, increasing by approximately 288 aircraft.

Very light jets (VLJs) entered the operational fleet in 2006. Also known as a microjet, the VLJ is commonly defined as a jet aircraft that weighs less than 10,000 pounds. There are several new aircraft that fall in this category including the Eclipse 500 jets. While not categorized by Cessna Aircraft as a VLJ, the Cessna Mustang is a competing aircraft to many of the VLJs expected to reach the market. These jets cost between $1 and $2 million, can takeoff on runways less than 3,000 feet, and cruise at 41,000 feet at speeds in excess of 300 knots. The VLJ is expected to redefine the business jet segment by expanding business jet flying and offering operational costs that can support on-demand air taxi point-to-point service. The FAA projects 350 VLJs in service in 2008.

TABLE 2C
Fractional Shares and Number of Aircraft in Use

Year	Number of Shares	Number of Aircraft
1986	3	N/A
1987	5	N/A
1988	26	N/A
1989	51	N/A
1990	57	N/A
1991	71	N/A
1992	84	N/A
1993	110	N/A
1994	158	N/A
1995	285	N/A
1996	548	N/A
1997	957	N/A
1998	1,551	N/A
1999	2,607	N/A
2000	3,834	N/A
2001	3,415	696
2002	4,098	776
2003	4,516	826
2004	4,765	865
2005	4,691	949
2006	4,903	984

Source: GAMA

In August 2007, the United States Government Accountability Office (GAO) issued report *GAO-07-1001, VERY LIGHT JETS*, subtitled, Several Factors Could Influence Their Effect on the National Airspace System. This report was conducted in response to the VLJ phenomenon as many aviation forecasters feared the VLJ would eventually lead to significant airspace congestion.

The report was not put forth to provide recommendations, but rather to provide information on the industry.

The following is a summary provided by the GAO report:

"The eight very light jet forecasts GAO examined provided a range of both the number of very light jets projected to be delivered (roughly 3,000 to 7,600) and the dates by which those numbers would be reached (from 2016 to 2025). The forecasts were based on limited information about the market for very light jets and varied based on a number of assumptions, particularly regarding the development of the air taxi market.

The studies GAO reviewed and the experts GAO contacted expressed varying opinions about the impact of very light jets on NAS capacity; however, most of the experts believed that very light jets would have little overall effect on safety. The studies found that the type of airports used by very light jets will influence very light jets' effect on capacity. Experts also mentioned other factors that could affect capacity such as aircraft usage, trip length, and altitude. Most experts GAO contacted believed that very light jets will likely have little impact on safety due to FAA's certification procedures for aircraft, pilots, and maintenance. "

The report provided limited forecast information developed by eight entities, one being the FAA projections presented in the previous section. All forecasts assumed moderate to strong economic growth. Other factors which will impact the VLJ industry were also considered.

Many believed that the replacement market will be positive for the VLJ industry as older twin engine piston and turboprop aircraft are retired, and some aircraft owners will likely replace them with VLJ aircraft. Another factor is the influence of high numbers of available VLJ models on the market. Rolls-Royce indicated in their analysis that there tends to be a correlation between total aircraft deliveries and number of models on the market. Other factors which will positively influence VLJ growth will be dissatisfaction with other transportation modes, low purchase price of VLJ aircraft, and access to airports with appropriate infrastructure. These factors will be more positive influences to the growth of VLJ markets. Negative factors could include uncertainty of success leading to hesitations in acquiring the VLJ, new training and high cost of insurance, as well as production constraints associated with new aircraft manufacturers.

The eight VLJ forecasts examined by the GAO were somewhat divergent. These forecasts range between 3,106 and 7,649 VLJ deliveries. The difficulty with comparing the forecasts, however, is that several have differing "out years." Some forecast through 2016 while others projected to 2020 and even 2025. **Table 2D** presents the VLJ forecast figures included in the GAO report.

TABLE 2D
Total Forecast Number of VLJ Deliveries

Forecasting Entity	Forecast End Year	Forecast VLJs Delivered
Embraer – Without strong air taxi demand	2016	~3,000
Embraer – With strong air taxi demand	2016	~6,000
Forecast International (aerospace consulting firm)	2016	~6,000
Honeywell (manufacturer of airspace products)	2016	~5,000
PMI Media (aerospace/defense publisher)	2016	4,124
Teal Group (aerospace consulting firm)	2016	~3,000
Velocity Group (consulting firm) – Moderate air taxi growth	2016	~4,000
Velocity Group (consulting firm) – Strong air taxi growth	2016	~6,000
FAA	2020	6,300
Rolls-Royce	2025	~7,500

Source: FAA

The FAA forecast assumes that the regulatory environment affecting general aviation will not change dramatically. It is expected that the U.S. economy will continue to expand through 2008, and then continue to grow moderately thereafter. This will positively influence the aviation industry, leading to passenger, air cargo, and general aviation growth throughout the forecast period (assuming that there will not be any new successful terrorist incidents against either U.S. or world aviation). The FAA does recognize that a major risk to continued economic growth is upward pressure on commodity prices, including the price of oil. The price of oil is expected to become somewhat less volatile through the remainder of the forecast period.

The FAA projects the active general aviation aircraft fleet to increase at an average annual rate of 1.4 percent over the 17-year forecast period, increasing from 225,007 in 2007 to 286,500 in 2025. This growth is depicted on **Exhibit 2A**. FAA forecasts identify two general aviation economies that follow different market patterns. The turbine aircraft fleet is expected to increase at an average annual rate of 3.7 percent, increasing from 25,262 in 2007 to 48,895 in 2025. Factors leading to this substantial growth include expected strong U.S. and global economic growth, the continued success of fractional-ownership programs, the growth of the VLJ/microjet market, and a continuation of the shift from commercial air travel to corporate/business air travel by business travelers and corporations. Piston-powered aircraft are projected to show minimal growth through 2025 at 0.5 percent annually. Single engine piston aircraft are projected to grow at 0.5 percent annually while multi-engine piston aircraft are projected to decrease in number by 0.9 percent annually. Piston-powered rotorcraft aircraft are forecast to increase by 4.7 percent annually through 2025.

Aircraft utilization rates are projected to increase through the 14-year forecast period. The number of general aviation hours flown is projected to increase at 3.0 percent annually. Similar to active

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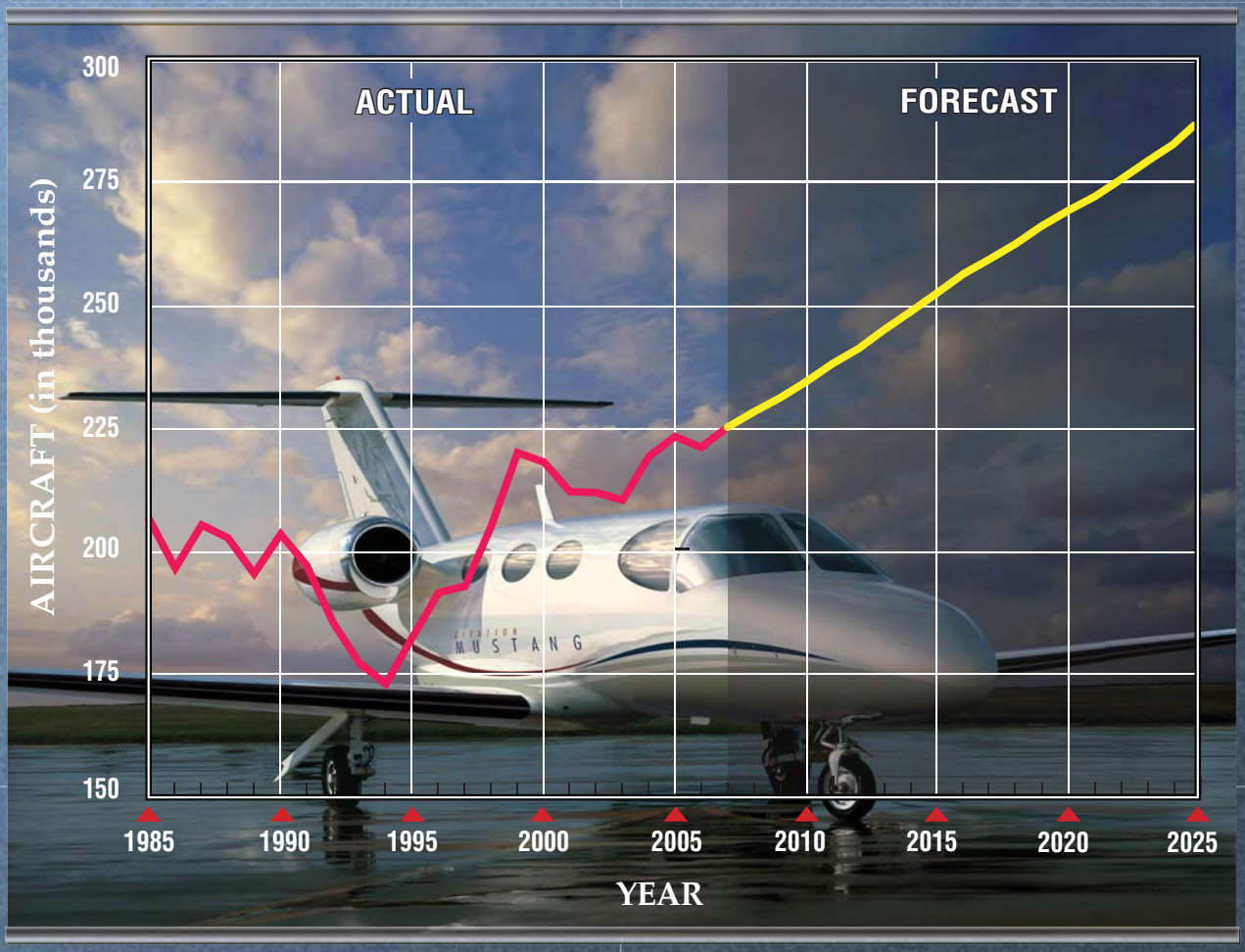
U.S. ACTIVE GENERAL AVIATION AIRCRAFT



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

Year	FIXED WING				ROTORCRAFT		Experimental	Sport Aircraft	Other	Total
	PISTON		TURBINE							
	Single Engine	Multi-Engine	Turboprop	Turbojet	Piston	Turbine				
2007 (Est.)	144.6	18.5	8.2	11.0	3.6	6.0	23.9	2.7	6.4	225.0
2015	145.6	17.2	9.3	19.8	6.2	7.3	29.7	10.5	6.5	252.3
2020	150.0	16.5	10.1	24.9	7.3	7.9	32.6	13.2	6.4	268.9
2025	157.4	15.6	10.8	29.5	8.3	8.6	35.2	14.7	6.4	286.5

Source: FAA Aerospace Forecasts, Fiscal Years 2008-2025.

Notes: An active aircraft is one that has a current registration and was flown at least one hour during the calendar year.

CAMARILLO AIRPORT

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

aircraft projections, there is projected disparity between piston and turbine aircraft hours flown. Hours flown in turbine aircraft are expected to increase at 5.3 percent annually, compared with 1.1 percent for piston-powered aircraft. Jet aircraft are projected to increase at 7.7 percent annually over the next 17 years, being the largest increase in any one category for total aircraft hours flown.

The total pilot population is projected to increase by 62,000 in the next 17 years, from an estimated 446,000 in 2007 to 508,000 in 2025, which represents an average annual growth rate of 0.7 percent. The student pilot population is forecast to increase at an annual rate of 1.0 percent, reaching a total of 100,200 in 2025. Growth rates for other pilot categories over the forecast period are as follows: recreational pilots remaining constant; commercial pilots increasing 0.5 percent; airline transport pilots increasing 0.4 percent; rotorcraft only pilots increasing 2.1 percent; glider only pilots increasing 0.3 percent; and private pilots increasing 0.2 percent. The sport pilot is expected to grow significantly through 2025 at 13.7 percent annually.

The general aviation industry has launched a series of programs and initiatives whose main goals are to promote and assure future growth within the industry. The "No Plane, No Gain" is an advocacy program created in 1992 by GAMA and the National Business Aircraft Association (NBAA) to promote acceptance and increased use of general aviation as an essential, cost-effective tool for businesses. Other programs are intended to promote growth in new pilot starts and introduce people to general aviation. "Project Pilot," sponsored by the Aircraft Owners and Pilots Association (AOPA), promotes the training of new pilots in order to increase and maintain the size of the pilot population. The "Be A Pilot" program is jointly sponsored and supported by more than 100 industry organizations. The NBAA sponsors "AvKids," a program designed to educate elementary school students about the benefits of business aviation to the community and career opportunities available to them in business aviation. The Experimental Aircraft Association (EAA) promotes the "Young Eagles" program which introduces young children to aviation by offering them a free airplane ride courtesy of aircraft owners who are part of the association. Over the years, programs such as these have played an important role in the success of general aviation and will continue to be vital to its growth in the future.

AVIATION TRENDS IMPACT ON CAMARILLO

Camarillo Airport is a general aviation airport but is influenced by the national and regional commercial service trends. The events of September 11, 2001 caused significant passenger and financial losses for the airline industry; however, it created a significant growth segment in general aviation. These events spurred greater security measures which increased travel times for commercial passengers.

For business executives, time is a valuable asset which is even more costly than the price of an airline ticket.

Many companies have turned to general aviation as an alternative measure for flying in order to recapture times savings. Moreover, the FAA forecasts indicate that the commercial airlines and the airports they serve are again becoming capacity constrained. These factors will likely influence an even greater demand for general aviation use, thus increasing demand at airports such as CMA.

General aviation is in a state of rapid flux. Corporate aircraft use has been bolstered by the emergence of fractional ownership programs and VLJs. Fractional ownership aircraft typically do not require full-time space, such as hangar space, at an airport, but do require highly functional passenger terminal spaces and services. Moreover, this too will be the case when VLJs used by programs such as DayJet become more common. Sport pilot rules make it easier and relatively less expensive to fly and should significantly increase the pool of aviators as a result.

Another issue which will influence change at Camarillo is regional in nature. Camarillo Airport is one of three airports located in the 12th most populated county in the State of California. More importantly, vehicular travel in the region is taxing due to congestion. As a result, the local airports will fare well to serve regional demand. Camarillo Airport is the most substantial of all Ventura County airports as well as the only facility which has the ability to be readily expanded to meet growing demand. Moreover, the airport is often the first thing a transient visitor will see of a community. Thus, it is very important that the airport and its facilities project a desired image to those using it.

Given this changing environment, it is imperative that airports such as Camarillo be readied to meet the market demand. The airport has much to offer but also much potential. The analysis to follow will factor the emerging markets as well as normal growth. Analysis in the following chapters will factor the national and regional trends in order to position the County and airport to capture the demand.

SOCIOECONOMIC PROJECTIONS

The local socioeconomic conditions provide an important baseline for preparing aviation demand forecasts. Local socioeconomic variables such as population, employment, and income can be indicators for understanding the dynamics of the community and, in particular, the trends in aviation growth. The following is a summary of the research presented in Chapter One. Information was obtained from a variety of sources including Ventura County, U.S. Census Bureau, California Department of Finance, and California Economic Development Department for population and employment. Income information was obtained from the U. S. Census Bureau and Woods and Poole Economics.

POPULATION

Table 2E summarizes historical and forecast population projections for Ventura County. The analysis of historical

population information for Ventura County indicates an annual average growth rate (AAGR) of 1.42 percent between 1995 and 2005. The Ventura County resident population increased by 106,400 over the ten-year period, reaching 809,230 in 2005. Future population projection data for Ventura County is also presented in **Table 2E**. The population for Ventura County is forecast to exceed one million by 2028. This projection equates to an AAGR of 1.06 percent between 2005 and 2028.

TABLE 2E
Socioeconomic Projections

	HISTORICAL			FORCAST			AAGR	
	1995	2000	2005	2013	2018	2028	95-05	05-28
VENTURA COUNTY								
Population	702,830	753,197	809,230	884,868	935,386	1,030,383	1.42%	1.06%
Employment	379,300	392,400	420,400	507,801	589,323	630,530	1.03%	1.78%
PCPI ($04)	$31,077	$36,323	$39,229	$39,829	$41,667	$46,002	2.36%	0.69%

Source: Population from California Department of Finance; Employment from California Economic Development Department; PCPI from Woods & Poole Economics

EMPLOYMENT

Historical and forecast employment data for Ventura County is also presented in **Table 2E**. County employment experienced a 1.03 percent AAGR between 1995 and 2005 increasing by 41,100. Employment projections for the County indicate more rapid growth over the next 23 years, increasing at an AAGR of 1.78 percent. The projected employment growth for the County will provide a strong base for increased aviation demand in the region.

PER CAPITA PERSONAL INCOME

Table 2E presents per capita personal income (PCPI), adjusted to 2004 dollars, for Ventura County. From 1995 to 2005, PCPI for the region showed substantial growth increasing at an AAGR of 2.36 percent, which far outpaced population and employment growth. Through 2028, Ventura County is projected to experience a slower, more moderate gain in PCPI.

AIRPORT SERVICE AREA

The initial step in determining the general aviation demand for an airport is to define its generalized service area. The airport service area is determined primarily by evaluating the location of competing airports, their capabilities and services, and their relative attraction and convenience. Also, to aid in identifying the generalized service area for Camarillo Airport, an analysis of the addresses for aircraft owners located in Ventura County was conducted.

The airport service area is a generalized geographical area where there is a potential market for airport services. Access to general aviation airports, commercial air service, and transportation networks enter into the equation to determine the size of a service area, as

well as the quality of aviation facilities, distance, and other subjective criteria. Typically, the service area for a rural general aviation airport can extend up to 30 miles. Reliever general aviation airports, especially those in large urban settings, can expect a service area to be somewhat less sizable and even less definable.

The proximity and level of service offered by other airports are largely the defining factors when describing the airport service area. A description of nearby airports was previously completed in Chapter One. Camarillo Airport is one of three airports located in Ventura County. Santa Paula and Oxnard Airports offer the only competitive environments for aviation demand in the immediate region. More distant airports in Santa Barbara, Van Nuys, Burbank, and Los Angeles will effectively limit the outer extents of the CMA service area.

Oxnard Airport is a commercial service airport also owned and operated by Ventura County. The airport is served by a single runway which is 5,953 feet long and has approximately 184 based aircraft. While Oxnard Airport is a full service, highly functional airport, it is somewhat limited for future growth. Most of the existing airport property is developed, leaving relatively little space left for future aviation facility development. Moreover, area land uses prohibit the airport from expanding beyond the existing boundaries. As a result, Oxnard Airport will continue to be a vital aviation facility in the region, but will not be capable of accommodating a large influx of the region's growing aviation demand.

Santa Paula Airport is also located in Ventura County and is located approximately eight miles north of CMA. The airport is supported by a single runway which is 2,665 feet long and has approximately 250 based aircraft. Similar to Oxnard Airport, Santa Paula Airport is constrained by existing land uses and limited airport property to develop future aviation facilities to meet a growing aviation demand.

The next nearest civilian airport is located in Van Nuys. The Van Nuys Airport is located approximately 30 nautical miles to the east of CMA and boasts parallel runways. Runway 16R-34L is 8,001 feet long. The airport is a substantial general aviation airport serving the Los Angeles area's aviation demand. While this airport may attract some activity from eastern Ventura County, it is unlikely to draw a significant portion due to its location and higher costs.

Most aircraft owners desire to operate at airports nearer their home or business. Access to Van Nuys from central and western portions of Ventura County can be a lengthy proposition due to congested thoroughfares. Moreover, Van Nuys Airport has the ability to charge higher fees and rents due to its prime location in the Los Angeles area. As a result, Van Nuys Airport does impact aviation demand at Camarillo Airport; however, it will serve only as the eastern boundary of the CMA service area. As population growth continues to shift towards Camarillo, it is more likely that CMA will attract more demand from eastern Ventura County away from Van Nuys and other Los Angeles area airports.

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

In determining the aviation demand for an airport, it is necessary to identify the role of that airport. The primary role of Camarillo Airport is to serve the needs of general aviation operators in the region. General aviation is a term used to describe a diverse range of aviation activities which includes all segments of the aviation industry except commercial air carriers and the military. This includes recreational flying in single engine aircraft, up to corporate business jets and even charter cargo operators. In addition, Camarillo Airport is a designated reliever airport. In this capacity, Camarillo Airport should be maintained to accommodate all general aviation aircraft, such as business jets, to minimize congestion at commercial service airports.

When discussing an airport service area, two primary demand segments need to be addressed. The first component is the airport's ability to attract based aircraft. Almost universally, aircraft owners choose to base at an airport nearer their home or business. Convenience is the most common reason for basing in close proximity. The second segment is itinerant aircraft operations. In most cases, transient aircraft operators will also elect to utilize airports nearer their intended destination. This, however, is highly dependent on the airport's capabilities to accommodate the aircraft operator. As a result, the more attractive the facility, the more likely an airport will be to attract a larger portion of the region's itinerant aircraft operations.

Given these considerations, the Camarillo Airport service area will include all of Ventura County. Due to terrain and limited or timely ground access, the service area does not extend into neighboring counties. As previously mentioned, the aviation demand in the easternmost portion of the county will be influenced by Van Nuys Airport, while Oxnard and Santa Paula Airports will also compete for the remainder of the County's aviation demand. CMA has fared well in competing for demand within the county's airport system as it has the county's longest public use runway, most hangar facilities, and the greatest expansion capability.

Exhibit 2B depicts the location of the residences/businesses of all aircraft registered in Ventura County for 1994 and 2008. This data was obtained from FAA records. The largest concentrations of Ventura County registered aircraft owners reside (home or business) within incorporated areas of Camarillo, Oxnard, Thousand Oaks, and Simi Valley. As depicted on the exhibit, the vast majority of registered aircraft in the county are located within 20 miles of CMA in 2008. In fact, more than 50 percent of the county's registered aircraft owners reside (either home or business) within ten miles of CMA. Another 505 aircraft

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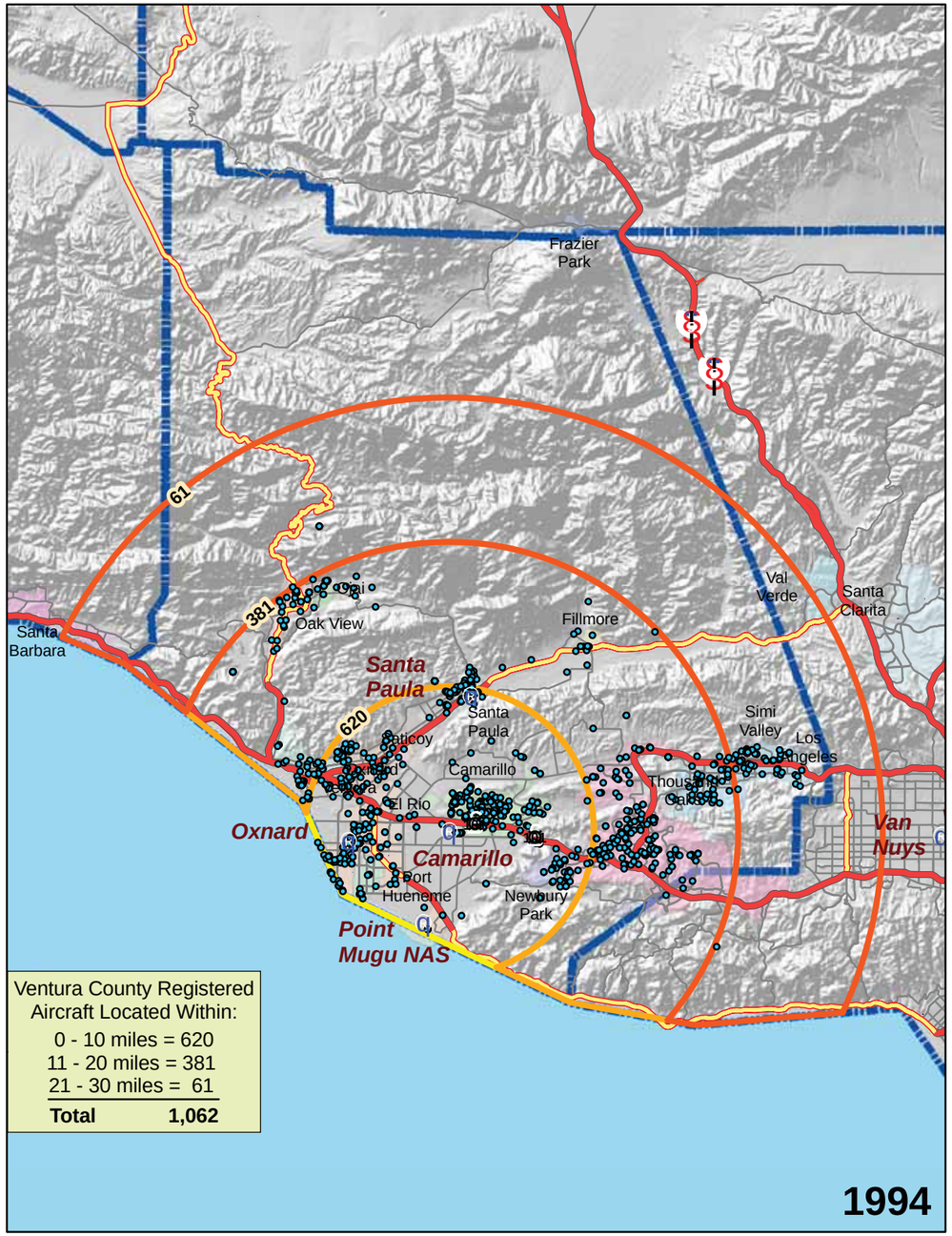
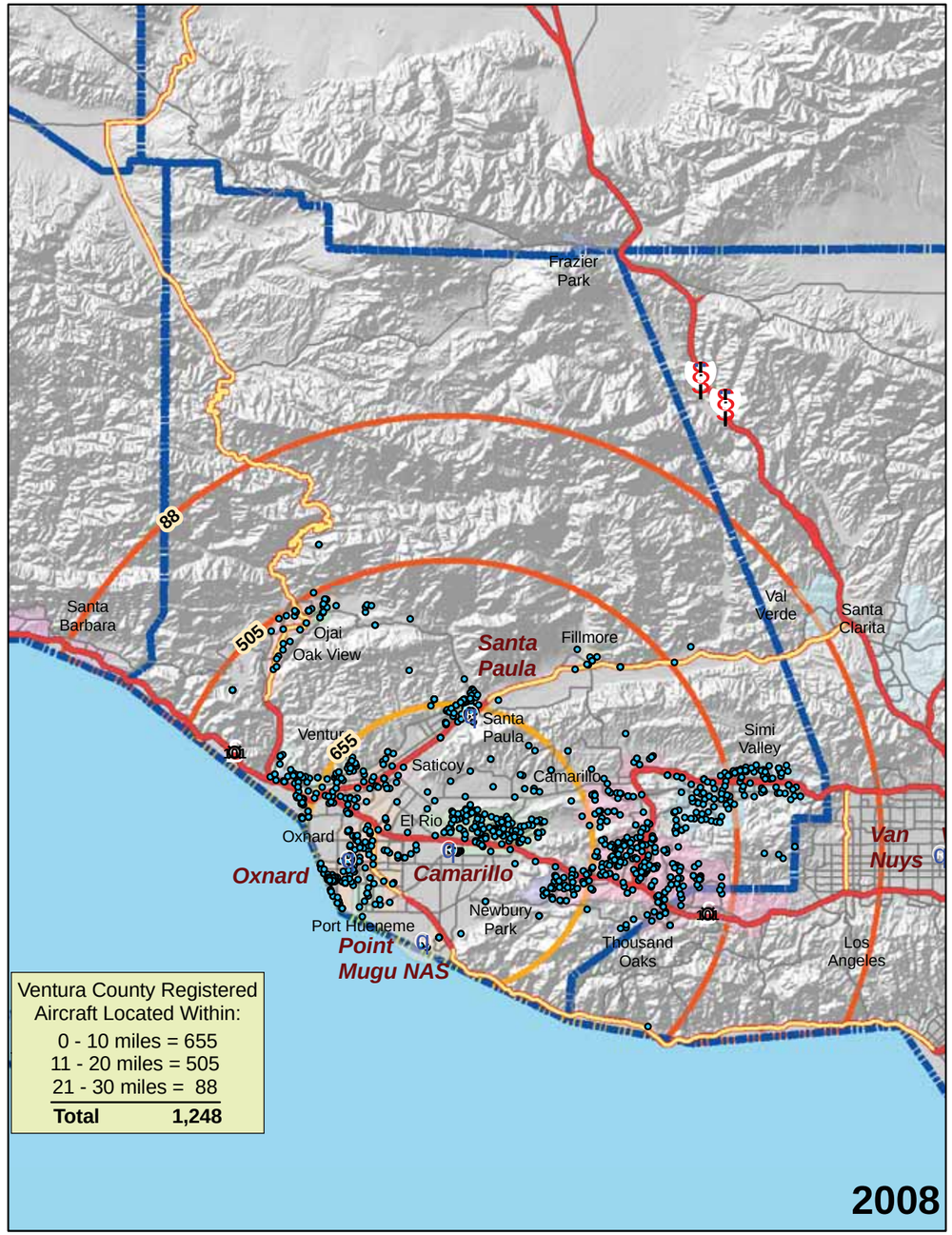


Ventura County Registered Aircraft Located Within:

0 - 10 miles = 620
11 - 20 miles = 381
21 - 30 miles = 61

Total 1,062

1994



Ventura County Registered Aircraft Located Within:

0 - 10 miles = 655
11 - 20 miles = 505
21 - 30 miles = 88

Total 1,248

2008

Registered Aircraft 1994-2008

Ventura County, CA

- Regional_Airports
- Limited Access
- Highways
- Secondary Roads
- Other
- Highway Ramp
- County Boundary

Buffer Radius

30 miles
20 miles
10 miles

88 Count by Distance from Camarillo Airport

NORTH

0 20
Miles

0 6 12 18 24
Kilometers

CAMARILLO AIRPORT

Exhibit 2B
VENTURA COUNTY REGISTERED AIRCRAFT

are located between 10 and 20 miles from the airport. Thus, of the county's 1,248 aircraft, 1,160 are owned by individuals or businesses located within 20 miles of the airport.

The remainder of this chapter will examine the future aviation demand potential of CMA considering the socioeconomic and aviation demand factors in the county.

FORECASTING APPROACH

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

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

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

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

Regression analysis measures the statistical relationship between dependent and independent variables yielding a "correlation coefficient." The correlation coefficient (Pearson's "r") measures association between the changes in a dependent variable and independent variable(s). If the r-squared (r^2) value (coefficient determination) is greater than 0.90, it indicates good predictive reliability. A value below 0.90 may be used with the understanding that the predictive reliability is lower.

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

It is important to note that one should not assume a high level of confidence in forecasts that extend beyond five years.

Facility and financial planning usually require at least a ten-year view, since it often takes more than five years to complete a major facility development program. However, it is important to use forecasts which do not overestimate revenue-generating capabilities or understate demand for facilities needed to meet public (user) needs.

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

The following forecast analysis examines each of the aviation demand categories expected at Camarillo Airport for the next 20 years. Each segment will be examined individually, and then collectively, to provide an understanding of the overall aviation activity at Camarillo Airport through 2028.

GENERAL AVIATION FORECASTS

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. Indicators of general aviation demand include:

- Based Aircraft
- Based Aircraft Fleet Mix
- General Aviation Operations
- Air Taxi Operations
- Military Operations
- Peaking Operations
- Annual Instrument Approaches

The remainder of this chapter will examine historical trends and project future demand for these segments of general aviation activity at the airport.

BASED AIRCRAFT

The number of based aircraft is the most basic indicator of general aviation demand. By first developing a forecast of based aircraft, other demand elements can be projected based upon this trend. An effective method of forecasting based aircraft at an airport is to first examine aircraft ownership in an airport's service area. As previously outlined, the service area for Camarillo Airport is Ventura County. Thus, the forecasting effort will begin by analyzing historical trends and projecting future demand for the county's registered aircraft. As a result, this information can then be related to the historical trends at CMA and future based aircraft projections can be made.

Registered Aircraft Forecasts

Aircraft ownership records for Ventura County were obtained from the FAA aircraft registration database and are presented in **Table 2F**. The table presents historical aircraft registrations for Ventura County between 1994 and 2008. The number of aircraft generally decreased from 1994 to 2000, reaching a low of 1,018 registrations in 1999. Since that time, however, the numbers have been generally increasing, reaching a period high of 1,248 in 2008. Over the period, Ventura County registered aircraft increased by 186; however, it increased by 230 between 2000 and 2008.

TABLE 2F
Historical County Registered Aircraft

Year	Registered Aircraft
1994	1,062
1995	1,049
1996	1,031
1997	1,029
1998	1,033
1999	1,018
2000	1,089
2001	1,120
2002	1,114
2003	1,129
2004	1,141
2005	1,198
2006	1,199
2007	1,244
2008	1,248

Source: FAA

Statistical Trends and Regression

Regression analysis was the first method utilized for developing registered aircraft projections. These analyses utilized socioeconomic and national aviation variables to determine if there were any statistical correlations with historic regional aircraft trends. As mentioned earlier, a correlation coefficient greater than 0.90 yields good predictive reliability.

First, a time-series analysis was conducted which utilizes regression as a means to evaluate the statistical relationship of growth simply over time. For the period of 1994 through 2008, the analysis returned an r^2 value of 0.85. While this value is reasonable, it falls below the desired level of 0.90. The series was then shortened to include the ten year period between 1999 and 2008. The relationship of the data for this period was much stronger, providing an r^2 value of 0.94. This projection yields 1,370 registered aircraft by 2013 and 1,760 registered aircraft by 2028, the end of the 20-year planning period.

Next, regression analysis was conducted comparing the county's registered aircraft with socioeconomic factors. Similar to the time-series analysis, the 1994-2008 periods for population and employment comparisons failed to present an r^2 value greater than 0.90. The shorter ten year periods, however, met the threshold. The regression analysis comparing county population with aircraft registrations from 1999-2008 yielded an r^2 value of 0.92 and 1,676 registered aircraft by 2028. For county employment, the data set compared values for 1995 and the years 2000 through 2008. This analysis provided an r^2 value of 0.91 and 1,556 registered aircraft by 2028.

Market Share of U.S. Fleet

The next method for developing registered aircraft projections included com-

paring the aircraft registered in Ventura County with the active general aviation aircraft fleet in the United States.

Table 2G provides the historical market share since 1998.

TABLE 2G
Ventura County Aircraft Market Share

Year	U.S. Active Aircraft	County Aircraft	Market Share
1998	204,710	1,033	0.505%
1999	219,464	1,018	0.464%
2000	217,533	1,089	0.501%
2001	211,446	1,120	0.530%
2002	211,244	1,114	0.527%
2003	209,606	1,129	0.539%
2004	219,319	1,141	0.520%
2005	224,262	1,198	0.534%
2006	221,942	1,199	0.540%
2007	225,007	1,244	0.553%
CONSTANT SHARE PROJECTION			
2013	245,191	1,356	0.553%
2018	262,278	1,450	0.553%
2028	298,356	1,650	0.553%
INCREASING SHARE PROJECTION			
2013	245,191	1,373	0.560%
2018	262,278	1,521	0.580%
2028	298,356	1,790	0.600%

Source: FAA Aerospace Forecasts FY 2008-2028 (extrapolated); Ventura County Registered from Aviation Goldmine; 1998 to 2007, Avantext

Two forecasts were developed considering the county's share of U.S. active aircraft. First, a forecast maintaining a constant 0.553 percent share of U.S. active aircraft was developed. This forecast yields 1,650 registered aircraft by 2028. Next, an increasing share forecast was developed based on the trend established over the period. As presented in the table, the increasing share forecast yields 1,790 aircraft by 2028.

Market Share of County Residents

Another method of forecasting study area aircraft registrations considers the number of aircraft per 1,000 residents in the study area. As mentioned earlier, the airport's service area is Ventura County and is thus being used for the population comparison. **Table 2H** presents historical and forecast registered aircraft per 1,000 residents of Ventura County.

TABLE 2H
Ventura County Aircraft per 1,000 Resident Projections

Year	County Aircraft	County Population	Ratio
1994	1,062	697,180	1.52
1995	1,049	702,830	1.49
1996	1,031	707,772	1.46
1997	1,029	716,062	1.44
1998	1,033	725,390	1.42
1999	1,018	735,960	1.38
2000	1,089	753,197	1.45
2001	1,120	765,962	1.46
2002	1,114	779,992	1.43
2003	1,129	792,361	1.42
2004	1,141	802,215	1.42
2005	1,198	809,230	1.48
2006	1,199	815,758	1.47
2007	1,244	823,129	1.51
2008	1,248	831,587	1.50
CONSTANT SHARE			
2013	1,327	884,868	1.50
2018	1,403	935,386	1.50
2028	1,546	1,030,383	1.50
DECREASING SHARE			
2013	1,310	884,868	1.48
2018	1,366	935,386	1.46
2028	1,463	1,030,383	1.42

Source: California Department of Finance (extrapolated); Ventura County Registered from Aviation Goldmine; 1994 to 2008, based on FAA records

Two forecasts were developed considering aircraft registrations per 1,000 residents. First, a constant ratio projection, following recent trends, yielded 1,546 aircraft by 2028. Next, a decreasing ratio projection falling from 1.48 to 1.42 aircraft per 1,000 residents yielded 1,463 aircraft registrations in Ventura County by 2028.

Registered Aircraft Summary

Table 2J summarizes all registered aircraft projections and presents the selected forecast for Ventura County. Several forecasts appear reasonable while others may not be realistic. The high end of the planning envelope is defined by the increasing market share of U.S. active aircraft which yields 1,790 aircraft by 2028. The low end is defined by the decreasing share of aircraft per 1,000 county residents at 1,463 aircraft by 2028. The first five years of the planning period will likely experience slow to moderate growth due to the current economic recession and high fuel costs, but the later years will likely have accelerated growth as the economy improves and oil prices stabilize. The selected forecast presented in the table takes these factors into consideration and provides a reasonable and slightly optimistic projection. The forecasts developed for the County's registered aircraft are also depicted on **Exhibit 2C**.

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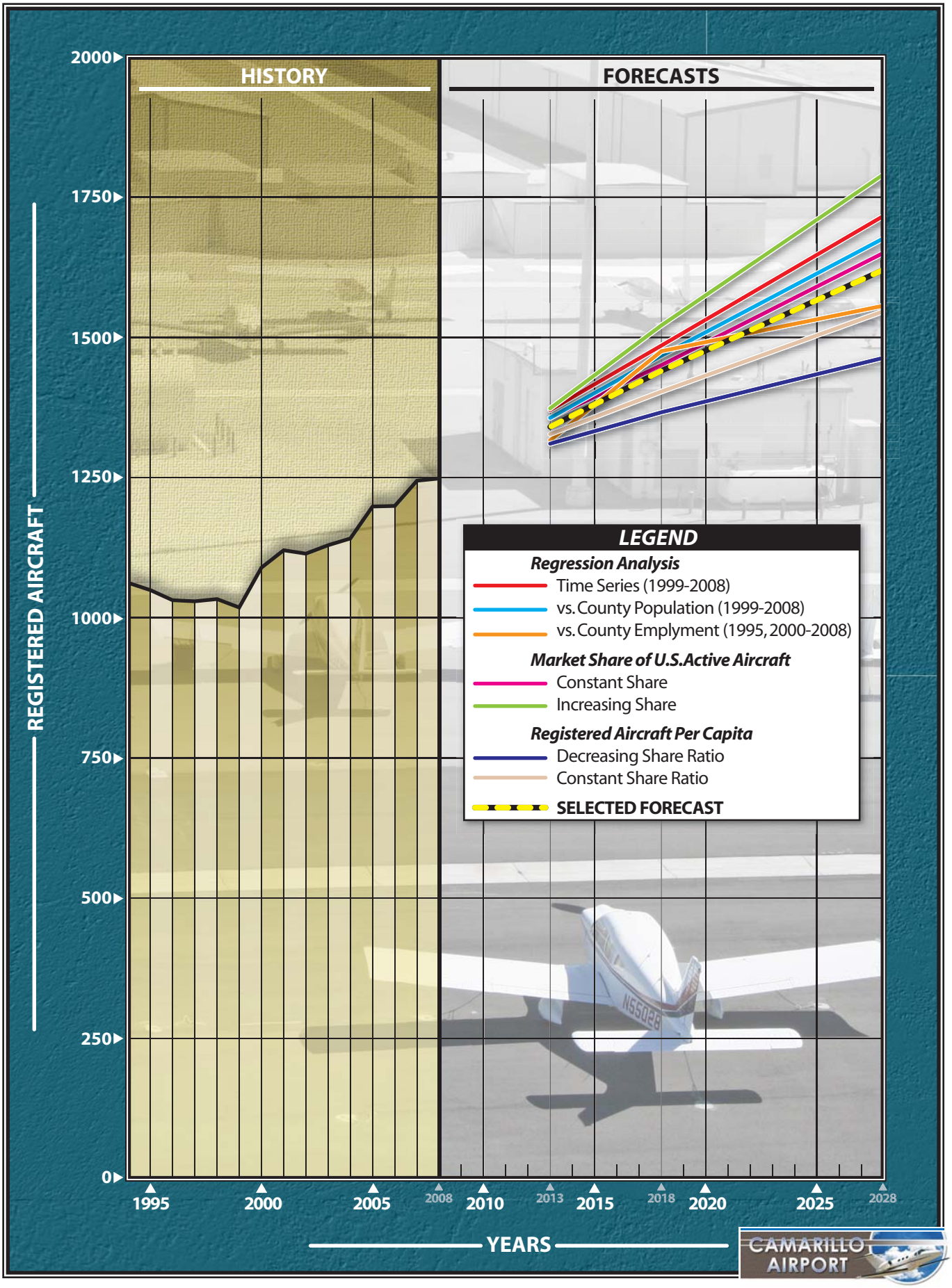

Exhibit 2C
VENTURA COUNTY REGISTERED
AIRCRAFT PROJECTIONS

TABLE 2J
Ventura County Registered Aircraft Forecast Summary

	2013	2018	2028
REGRESSION ANALYSIS			
Time Series			
1994-2008 (r^2 = 0.85)	1,309	1,390	1,553
1999-2008 (r^2 = 0.94)	1,370	1,485	1,716
vs. County Population			
1994-2008 (r^2 = 0.86)	1,301	1,380	1,527
1999-2008 (r^2 = 0.92)	1,356	1,467	1,676
vs. County Employment			
1995, 2000-2008 (r^2 = 0.91)	1,316	1,475	1,556
MARKET SHARE OF U.S. ACTIVE AIRCRAFT			
Constant Share (at 0.553%)	1,356	1,450	1,650
Increasing Share (reaching 0.650%)	1,373	1,521	1,790
REGISTERED AIRCRAFT PER CAPITA (1,000 COUNTY RESIDENTS)			
Decreasing Share Ratio (falling to 1.42)	1,310	1,366	1,463
Constant Share Ratio (maintaining 1.50)	1,327	1,403	1,546
SELECTED FORECAST	***1,340***	***1,440***	***1,620***

Based Aircraft Forecasts

Determining the number of based aircraft at an airport can be a challenging task. With the transient nature of aircraft storage, it can be hard to arrive at an exact number of based aircraft, as the total can change rapidly, even weekly. As a result, airports often don't keep records of based aircraft. However, the airport staff at Camarillo Airport has an existing count based on hangar storage counts. Unfortunately, these more exact counts do not exist for the period of 1995 through 2006. As a result, FAA data was utilized. While this data is not as accurate as the data maintained by the airport, it is reasonable for use in this study as it presents the FAA's estimate arrived by on-site visits to prepare the airport master record (FAA Form 5010).

Statistical Trends and Regression

Regression analysis was conducted on the historical based aircraft data set. As discussed previously, it is optimal to have an r^2 value near or above 0.90, which would represent a very strong correlation. The results of the regression analyses did not provide values near the 0.90 indicator. As a result, this type of analysis was not used for projecting based aircraft.

Market Share of County Registered Aircraft

Utilizing the county registered aircraft forecast, based aircraft at Camarillo Airport can be examined in comparison to historical regional registered aircraft. **Table 2K** presents based aircraft at

Camarillo Airport as a share of the study area's registered aircraft. As presented in the table, aircraft based at Camarillo Airport as a share of the county's registered aircraft has decreased since 1994. It should be noted, however, that the based aircraft for 1995 through 2006 are estimates and are likely higher than what was actually based at the airport. The 54.61 percent market share realized in 1994 is 12 percent higher than that of 2008.

TABLE 2K
CMA Based Aircraft Market Share of County Aircraft

Year	County Aircraft	CMA Based	Market Share
1994	1,062	580	54.61%
1995	1,049	598	57.01%
1996	1,031	598	58.00%
1997	1,029	600	58.31%
1998	1,033	600	58.08%
1999	1,018	576	56.58%
2000	1,089	576	52.89%
2001	1,120	576	51.43%
2002	1,114	576	51.71%
2003	1,129	588	52.08%
2004	1,141	588	51.53%
2005	1,198	588	49.08%
2006	1,199	600	50.04%
2007	1,244	513	41.24%
2008	1,248	533	42.71%
DECREASING SHARE PROJECTION			
2013	1,340	563	42.00%
2018	1,440	576	40.00%
2028	1,620	599	37.00%
CONSTANT SHARE PROJECTION			
2013	1,340	576	43.00%
2018	1,440	619	43.00%
2028	1,620	697	43.00%
INCREASING SHARE PROJECTION			
2013	1,340	583	43.50%
2018	1,440	662	46.00%
2028	1,620	842	52.00%
SELECTED FORECAST			
2013	1,340	570	42.54%
2018	1,440	630	43.75%
2028	1,620	750	46.30%

Source: Based aircraft from Airport and FAA records; Ventura County Registered from Aviation Goldmine; 1994 to 2008, Avantext from FAA records

Future based aircraft at Camarillo Airport will depend on several factors, including the state of the economy, fuel costs, available airport facilities, and competing airports. Forecasts assume a reasonably stable and growing economy after a short term decline, as well as reasonable development of airport facilities necessary to accommodate aviation demand. Competing airports will play a

role in deciding regional demand shifts; however, CMA will fare well in this competition as it is the county's most expandable facility.

Table 2K presents three market share projections of CMA's based aircraft as compared with Ventura County's registered aircraft. As presented in the table, the first based aircraft forecast considers that the airport would continue to follow a decreasing market share. This projection yields 599 based aircraft at CMA by 2028. While the historical trend of the last 15 years indicates a decreasing trend, future growth will not likely follow this path. As mentioned earlier, CMA is the only airport in the county capable of readily expanding to meet substantial growth. Moreover, the airport has more than 200 aircraft on its hangar waiting list. Obviously, the airport is in a desired location and has the ability to meet the demand with capital improvements such as additional hangars. Thus, the decreasing trend will likely prove low and unreasonable for planning purposes.

Next, a constant market share projection was developed. This forecast considers the airport maintaining a constant share of 43 percent of the county's aircraft through the planning period. As a result, the projection yields 697 based aircraft by 2028. While this projection appears reasonable, its basic assumption is that Oxnard, Santa Paula and Van Nuys Airports will continue to attract new county aircraft at the same pace as CMA. As previously mentioned, this is unlikely due to the relatively constrained natures of these airports due to boundary restrictions, lack of readily developable spaces, and high operational costs. This projection will serve as a moderate forecast for planning purposes.

The final market share projection considers CMA's potential to attract a greater share of the county's registered aircraft in the future. This forecast utilizes an increasing market share reaching 52 percent, slightly lower than the share experienced at the time of the last master plan study in 1994. This projection yields 842 aircraft based at CMA by 2028 as depicted on **Exhibit 2D**.

Comparative Forecasts

The FAA Terminal Area Forecast also contains projections of based aircraft. For 2013, the TAF projects 689 based aircraft, increasing to 756 by 2018. The 2025 TAF projection is for 861 based aircraft. Because the TAF does not project beyond 2025, an extrapolation of the data was performed resulting in 891 based aircraft for 2028. The 1994 Master Plan projected 640 based aircraft by 2000 and 890 by 2015.

Based Aircraft Summary

Deciding which forecast or which combination of forecasts to use to arrive at a final based aircraft forecast involves more than just statistical analysis. Consideration must be given to the current and future aviation conditions at the airport in the short term. For example, it is known that CMA currently has a large waiting list for hangar space on the airport. This list is updated on a regular basis and currently includes over 200 aircraft. If the airport were to

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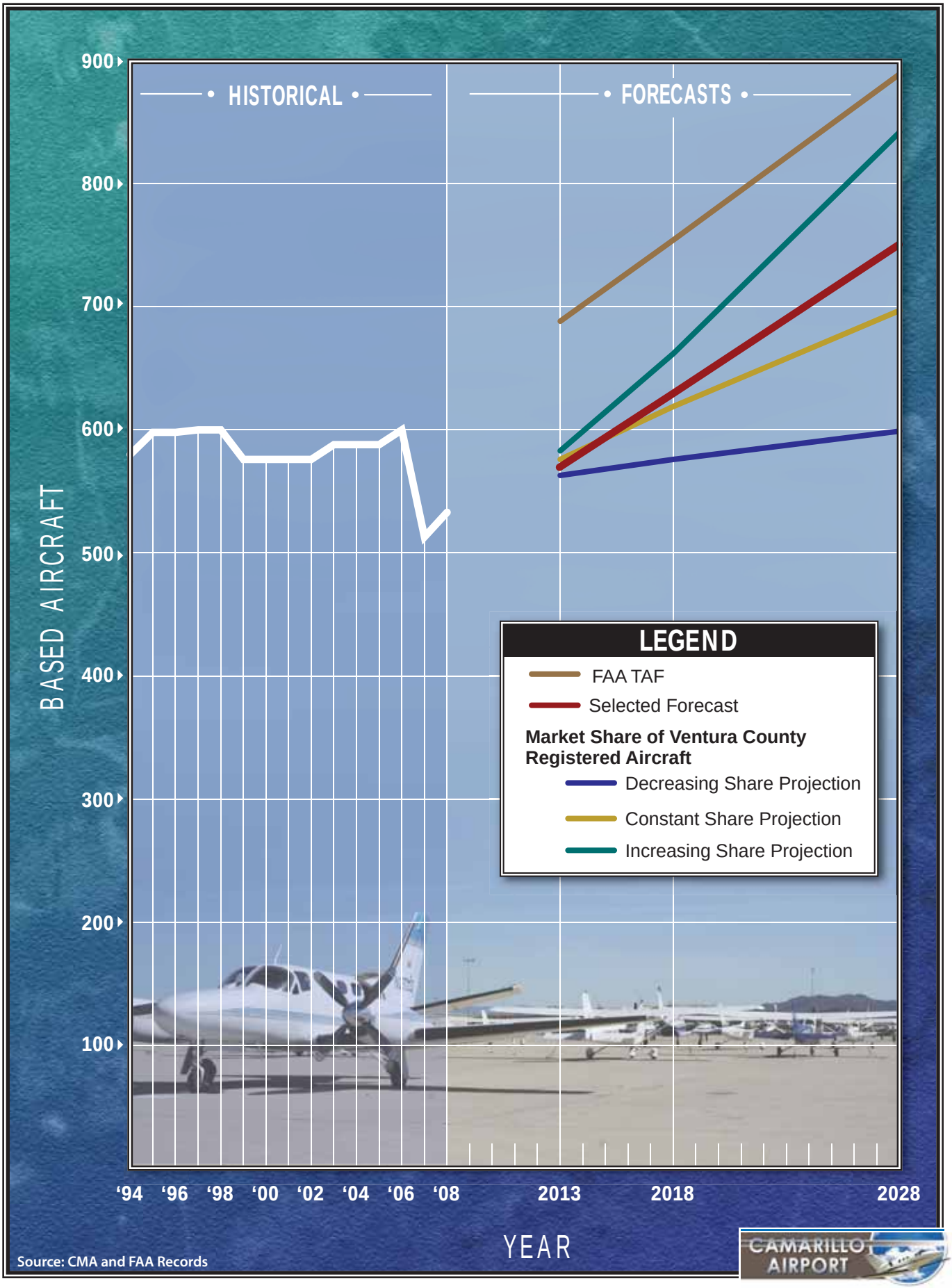


Exhibit 2D
BASED AIRCRAFT
PROJECTIONS

have more hangars constructed, it can be assumed that it would have little difficulty occupying the hangars, thus increasing its based aircraft numbers.

Experience indicates that when new hangars are constructed, those who rent the space are not always new based aircraft. Some of them will be aircraft owners who have used tie-downs or other facilities at the airport. Typically, a new hangar facility will attract up to 75 percent new based aircraft. Also, approximately 50-75 percent of those on the waiting list will actually sign a lease when the opportunity becomes available. Because the airport management actively contacts all those on the list, it is fair to assume that upwards of 75 percent of those on the waiting list would sign a lease and base at Camarillo Airport.

In addition, since the last master plan, Camarillo Airport has improved in a manner to be more attractive to aircraft owners, especially corporate owners. Two new FBOs have located at CMA, which enhances the airport's competitive environment and increases the level of services provided. Moreover, larger executive and conventional hangars have been constructed providing more space for larger cabin class executive aircraft. The addition of Taxiway G and the enlarged hold apron provide additional taxing efficiency and safety. Existing navigational aids such as the Automated Surface Observation System (ASOS) and airport traffic control tower (ATCT) are very much desired by aircraft owners, making the airport functional during inclement weather conditions.

The level of services, amenities, and airfield capabilities of other regional airports can also be a factor when projecting based aircraft. Aviation demand in the county has relatively few facilities to choose from. Both Oxnard and Santa Paula Airports are sizable and base over 200 aircraft; however, both are limited from substantial growth to meet future county aviation demand. Van Nuys is a substantial airport, but it is somewhat distant and its costs relatively high. As a result, CMA should be expected to serve a larger share of the county's aviation demand in the future.

Ventura County has made a concerted and successful effort to position the airport to accommodate and accept growth. As a result, future based aircraft should move toward the increasing market trend. Were the county to abandon the positive growth goals for the airport, or if the economy lapsed into a prolonged recession, then the lower projections could be realized. The county has given every indication that it plans to continue strong support of its airport.

The selected based aircraft forecast is presented in **Table 2K**. The projection considers a generally increasing market share of the county's registered aircraft; however, it is slower than the increasing trend projection. As detailed in the table, the forecast considers 570 aircraft by 2013, 630 aircraft by 2018, and 750 aircraft by 2028.

The five and ten year forecast figures consider the ill effects of an economy in recession and surging oil prices. While the 2013 figure could be reached with the addition of hangars to meet the

needs of those on the waiting list, it is also likely that the airport could lose some of its aircraft to those negatively impacted by the economy. The long term forecast may trend to be optimistic; however, it will serve well as a long term planning measure. Moreover, the 2028 based aircraft figure would represent 46.3 percent of the county's registered aircraft. This level has been experienced by CMA, and the increasing share of county aircraft trend is supported by the constraints of other regional airports in contrast with the expandable nature of CMA.

BASED AIRCRAFT FLEET MIX PROJECTION

Knowing the aircraft fleet mix expected to utilize the airport is necessary to properly plan facilities that will best serve the level of activity and the type of activities occurring at the airport. The existing based aircraft fleet mix is comprised of 429 single engine aircraft, 51 multi-engine piston-powered aircraft, 11 turboprops, 22 turbojet aircraft, and 20 helicopters.

As detailed previously, the national trend is toward a larger percentage of sophisticated turboprop, jet aircraft, and helicopters in the national fleet. Active multi-engine piston aircraft are expected to be the only category of aircraft which shows a decrease in annual growth. Growth within each based aircraft category at the airport has been determined by comparison with national projections (which reflect current aircraft production) and consideration of local economic conditions.

The projected trend of based aircraft at Camarillo Airport includes a growing number of aircraft in each category; however, single and multi-engine piston powered aircraft are projected to decline in percentage mix. Growth in turbojet aircraft is expected to be strong, as growth in turboprop and helicopter aircraft will remain relatively constant, increasing slightly. The based aircraft fleet mix projection for Camarillo Airport is summarized in **Table 2L**.

TABLE 2L
Based Aircraft Fleet Mix Forecast

Year	SEP	%	MEP	%	TP	%	J	%	R	%	Total
2008	429	80.49%	51	9.57%	11	2.06%	22	4.13%	20	3.75%	533
FORECAST											
2013	456	80.00%	51	8.95%	14	2.46%	28	4.91%	21	3.68%	570
2018	501	79.52%	52	8.25%	18	2.86%	35	5.56%	24	3.81%	630
2028	596	79.47%	55	7.33%	24	3.20%	45	6.00%	30	4.00%	750

SEP – Single Engine Piston; MEP – Multi-Engine Piston; TP – Turboprop; J – Jet; R – Rotorcraft

Currently, single engine aircraft compose the largest segment of aircraft type at Camarillo Airport, making up 80.49 percent of total based aircraft. The future based aircraft mix will continue to be dominated by single engine aircraft. Turbine aircraft are projected to more than double over the planning period. With the many recent improvements to the airport, as well as the projected

growth in population and employment in the region, it is reasonable to expect more jets and other turbo-powered aircraft to base at Camarillo Airport.

AIRPORT OPERATIONS

There are two basic types of operations at an airport: local and itinerant. A local operation is a takeoff or landing performed by an aircraft that operates within sight of the airport, or which executes simulated approaches and departures, or touch-and-go operations, at the airport. Generally, local operations are characterized by training operations. Itinerant operations are those performed by aircraft with a specific origin or destination away from the airport. These can be made by visitors to the airport or based aircraft operators.

Airport operations can be further broken down into distinct groups. For airports such as Camarillo, operations typically include general aviation, air taxi, and military. General aviation operations are those conducted by private individuals or companies not flying commercially. Air taxi refers to those operators that are certified in accordance with Federal Aviation Regulation (F.A.R.) Part 135 and are authorized to provide, on demand, public transportation of persons and property by aircraft. Military operations are those conducted by military personnel and aircraft.

Camarillo Airport does have an ATCT which is operated by the FAA. The ATCT conducts operational counts, amongst its other duties, for the period of 7:00 a.m. to 9:00 p.m. It should be noted that operational figures presented here do not include nighttime and very early morning operations when the ATCT is closed. Typically, up to three percent more operations will occur at a reliever airport during the hours when the ATCT is closed.

General Aviation Operations

In order to develop an updated forecast, the FAA's projections for annual general aviation operations at towered airports were examined, along with Camarillo's annual general aviation operations. According to FAA records, there were a total of 139,948 general aviation operations at CMA in 2007. As shown in **Table 2M**, this represents 0.413 percent of all general aviation operations at towered airports across the country. This is a decrease from 2002, when the airport's market share was the highest of the period at 0.534 percent. The generally decreasing market share trend can be directly attributed to an economic recession and high Avgas and jet fuel prices over the past two years.

One market share projection was made considering a slightly increasing market share of U.S. general aviation operations at towered airports. The increasing share forecast reaching 0.440 percent yields 190,900 annual general aviation operations by the year 2028. This forecast would equate to a slightly decreasing operation per based aircraft ratio over the period.

As noted in the table, the airport had 267 operations per based aircraft in 2007. This ratio had previously been as high as 349 in 2002, and exceeded 300 several times during the 15 year period. Reliever airports commonly have opera-

tions per based aircraft ratios of 300 or more. The resultant master plan forecast for general aviation operations would yield 255 operations per based aircraft by 2028 when compared to the master plan based aircraft forecasts.

TABLE 2M
General Aviation Operations Forecast
Camarillo Airport

	CMA Annual Operations			GA Operations (U.S.) at Towered Airports (in thousands)	CMA Market Share	Ops per Based Aircraft
YEAR	Itinerant	Local	Total			
1994	82,661	103,567	186,228	36,253.7	0.514%	321
1995	74,179	90,475	164,654	35,926.6	0.458%	275
1996	83,860	86,885	170,745	35,298.3	0.484%	286
1997	90,338	87,189	177,527	36,833.3	0.482%	296
1998	89,420	81,379	170,799	38,046.5	0.449%	285
1999	96,888	88,569	185,457	39,999.6	0.464%	322
2000	101,260	82,428	183,688	39,878.5	0.461%	319
2001	96,288	80,277	176,565	37,627.0	0.469%	307
2002	107,365	93,651	201,016	37,623.2	0.534%	349
2003	102,716	80,608	183,324	35,524.0	0.516%	312
2004	91,503	68,827	160,330	34,967.6	0.459%	273
2005	86,865	63,936	150,801	34,161.0	0.441%	256
2006	81,266	64,902	146,168	33,120.0	0.441%	244
2007	70,190	66,788	139,948	33,134.5	0.422%	273
MASTER PLAN FORECAST						
2013	88,000	61,200	149,200	35,516.9	0.420%	262
2018	94,000	68,100	162,100	37,691.9	0.430%	257
2025	106,900	84,000	190,900	43,377.3	0.440%	255
FAA TAF						
2013	86,854	64,172	151,026	35,516.9	0.420%	219
2018	93,094	64,172	157,266	37,691.9	0.430%	208
2028	104,053	64,172	168,225	43,377.3	0.440%	189

Source: CMA Ops from ATCT; U.S. Ops and Forecasts from FAA

This master plan forecast of general aviation operations is also compared against the FAA TAF in the table. The TAF projects 168,225 general aviation operations at CMA by 2028. It should be noted that the TAF projection keeps local operations at a constant level of 64,172 for the entire planning period. While local operations have been trending downward, it is reasonable to expect that these operations will return to some level of growth as oil prices and the economy stabilize. Also, the operations per based aircraft ratio presented in the TAF consider the TAF projections of both general aviation operations and a higher TAF based aircraft projection reaching 891 by 2028. As a result, the operations per based aircraft for the TAF projection are somewhat lower than the master plan forecast. **Exhibit 2E** depicts the master plan and TAF forecasts for general aviation operations.

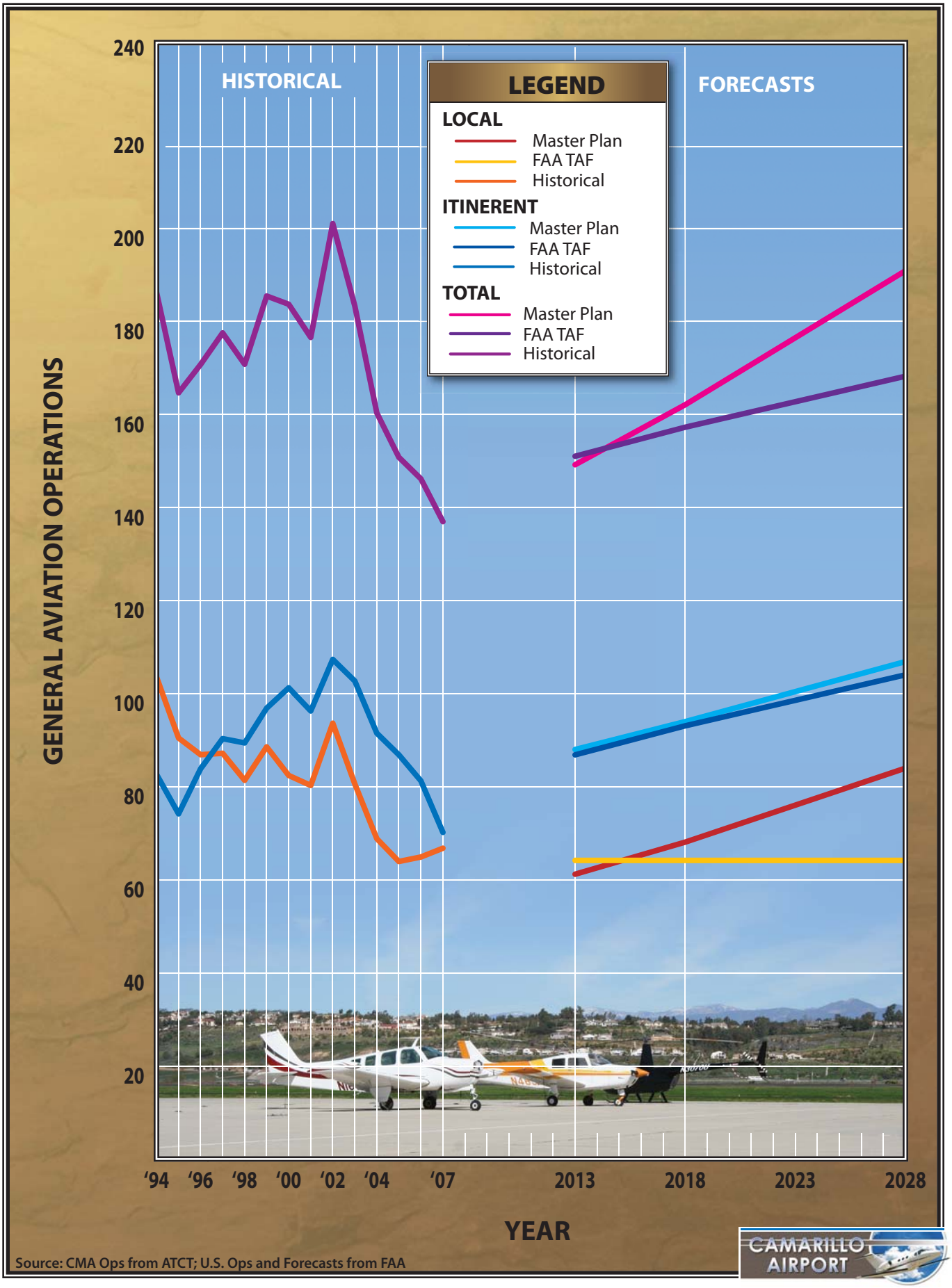


Exhibit 2E
GENERAL AVIATION
OPERATIONS FORECAST

Air Taxi Operations

The air taxi category includes aircraft involved in on-demand passenger charter, small parcel transport, and air ambulance activity. The history of air taxi operations at CMA Airport since 2000 is presented in **Table 2N**. Since 2000, air taxi operations have ranged between a low of 2,249 in 2007 and a high of 2,996 in 2006, just a year earlier. The FAA-TAF projects air taxi activity to remain level at 2,668 operations annually.

TABLE 2N
Air Taxi Operation Forecast
Camarillo Airport

Year	Air Taxi	Air Taxi Operations at U.S. ATCT Airports (in thousands)	Market Share
2000	2,560	10,760.60	0.0238%
2001	2,786	10,882.10	0.0256%
2002	2,823	11,029.40	0.0256%
2003	2,377	11,426.00	0.0208%
2004	2,367	12,243.90	0.0193%
2005	2,543	12,551.70	0.0203%
2006	2,996	11,967.60	0.0250%
2007	2,249	11,666.70	0.0193%
FORECAST			
2013	2,640	13,536.80	0.0195%
2018	3,310	15,784.60	0.0210%
2028	5,130	20,539.30	0.0250%

Similar to the general aviation operation forecast, the air taxi operation forecast for CMA considered the airport's historic market share of total U.S. towered airports air taxi operations. As presented in the table, CMA has maintained a relatively constant share ranging between 0.0193 percent and 0.0256 percent. The master plan forecast considers an increasing market share again reaching the previous share of 0.0250 percent by 2028. This projection yields 5,130 air taxi operations at CMA by 2028.

Military Operations

Military operations account for a small portion of operations at Camarillo Airport. There are no based military aircraft at the airport, but there are a number of military aircraft which transition through the region and make stops at CMA for fuel or to eat at the Waypoint Café. **Table 2P** presents the historical military operations at CMA. Because of the limited number of military operations from a historical perspective, a constant of 700 annual military operations will be utilized in the annual operations forecast. This projection considers 500 local and 200 itinerant annual military operations.

TABLE 2P
Military Operations Forecast
Camarillo Airport

Year	Itinerant	Local	Total
1994	2,501	96	2,597
1995	662	432	1,094
1996	61	68	129
1997	41	12	53
1998	211	29	240
1999	114	19	133
2000	123	103	226
2001	70	37	107
2002	92	10	102
2003	172	6	178
2004	176	16	192
2005	134	20	154
2006	147	514	661
2007	101	620	721
FORECAST			
2013	200	500	700
2018	200	500	700
2023	200	500	700

PEAKING CHARACTERISTICS

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

- **Peak Month -** The calendar month when peak aircraft operations occur.

- **Design Day -** The average day in the peak month. This indicator is 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.

- **Design Hour -** The peak hour within the design day.

The peak month is an absolute peak within a given year. All other peak periods will be exceeded at various times during the year. However, they do represent reasonable planning standards that can be applied without overbuilding or being too restrictive. Information related to peak operational activity is not available due to the short period of time the air traffic control tower has been in operation. Therefore, peak period forecasts have been determined according to trends experienced at similar airports.

Typically, the peak month for activity at general aviation airports approximates 10 to 15 percent of the airport's annual operations. The lower end of the standard is typical of good weather locales and for airports without extraordinary circumstances. According to ATCT records, the peak month for CMA in 2007 accounted for 9.6 percent of annual operations. For the past 15 years, the peak month has averaged 9.9 percent of annual operations. For planning purposes, peak month operations have been forecast at 9.9 percent of annual operations throughout the planning period.

The design day operations were calculated by dividing the peak month by 31. The peak month for each of the last 15 years occurred during a 31-day month, varying between May, July, or August. The design day is primarily used in airfield capacity calculations.

The busy day provides information for use in determining aircraft parking apron requirements and other capacity related analyses. Review of daily oper-

ational counts for the last five years indicates that the busy day averages 23.5 percent higher than the design day operations. Annual operations peaking characteristics are summarized in **Table 2Q**. Annual operations include all operations as presented in earlier sections.

TABLE 2Q
Peaking Forecast
Camarillo Airport

	1997	2013	2018	2028
TOTAL AIRPORT OPERATIONS				
Annual	139,948	152,540	166,110	196,730
Peak Month	13,414	15,101	16,445	19,476
Design Day	433	503	548	649
Busy Day	538	622	677	802
Design Hour	71	83	90	107

ANNUAL INSTRUMENT APPROACHES (AIAs)

An instrument approach, as defined by the FAA, is "an approach to an airport with the intent to land by an aircraft in accordance with an instrument flight rule (IFR) flight plan, when visibility is less than three miles and/or when the ceiling is at or below the minimum initial approach altitude." To qualify as an instrument approach at Camarillo Airport, aircraft must land at the airport after following one of the published instrument approach procedures and then properly close their flight plan on the ground. The approach must be conducted in weather conditions which necessitate the use of the instrument approach. If the flight plan is closed prior to landing, then the AIA is not counted in the statistics.

Forecasts of annual instrument approaches (AIAs) provide guidance in determining an airport's requirements for navigational aid facilities. It should be noted that practice or training approaches do not count as annual AIAs. Typically, AIAs for airports with available instrument approaches utilized by advanced aircraft will average between two and five percent of total itinerant operations. This is especially true for general aviation airports that currently, or are expected to, support corporate jet aircraft, which is the case for Camarillo Airport. Also, the increased availability of low-cost navigational equipment could allow for smaller and less sophisticated aircraft to utilize instrument approaches. National trends indicate an increasing percentage of annual approaches given the greater availability of approaches at airports with GPS and the availability of more cost-effective equipment. **Table 2R** summarizes both historical and forecast AIAs for the planning period.

According to the FAA Air Traffic Activity statistics, Camarillo Airport had 2,055 AIAs in 2004, the most recently available information provided by the FAA. The forecast presented in **Table 2R** utilized an industry standard constant ratio of 2.5 percent of itinerant operations to forecast future AIAs.

TABLE 2R
Annual Instrument Operations Forecast

Year	Itinerant Operations	AIA	Ratio
1995	76,207	2,236	2.93%
1996	85,952	3,911	4.55%
1997	92,197	2,031	2.20%
1998	91,670	1,652	1.80%
1999	98,984	2,313	2.34%
2000	103,945	2,149	2.07%
2001	99,146	2,944	2.97%
2002	110,280	2,638	2.39%
2003	105,273	2,870	2.73%
2004	94,046	2,055	2.19%
FORECAST			
2013	90,840	2,270	2.50%
2018	97,510	2,440	2.50%
2028	112,230	2,810	2.50%

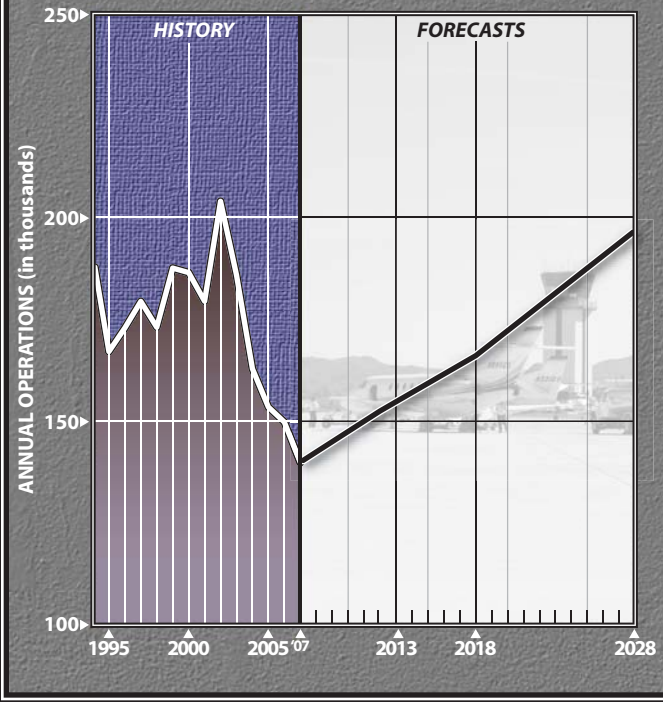
SUMMARY

This chapter has provided demand-based forecasts of aviation activity at Camarillo Airport over the next 20 years. An attempt has been made to define the projections in terms of short, intermediate, and long term expectations. Elements such as local socioeconomic indicators, anticipated regional development, and historical aviation data as well as national aviation trends were all considered when determining future conditions.

The next step in the master planning process will be to assess the capacity of existing facilities, their ability to meet forecast demand, and to identify changes to the airfield and/or landside facilities which will create a more functional aviation facility. A summary of aviation forecasts is depicted on **Exhibit 2F**.

06MP19-2F-06/027/08

	Base Year	2013	2018	2028
ANNUAL OPERATIONS				
Itinerant				
Air Taxi	2,249	2,640	3,310	5,130
General Aviation	70,190	88,000	94,000	106,900
Military	101	200	200	200
Total Itinerant	**72,540**	**90,840**	**97,510**	**112,230**
Local				
General Aviation	66,788	61,200	68,100	84,000
Military	620	500	500	500
Total Local	**67,408**	**61,700**	**68,600**	**84,500**
TOTAL OPERATIONS	***139,948***	***152,540***	***166,110***	***196,730***
Annual Instrument Approaches	***2,055***	***2,270***	***2,440***	***2,810***
BASED AIRCRAFT				
Single Engine	429	456	501	596
Multi-engine	51	51	52	55
Turboprop	11	14	18	24
Jet	22	28	35	45
Helicopter	20	21	24	30
Total Based Aircraft	**533**	**570**	**630**	**750**
OPERATIONAL PEAKING FORECASTS				
Peak Month	13,414	15,101	16,445	19,476
Design Day	433	503	548	649
Busy Day	538	622	677	802
Design Hour	71	83	90	107



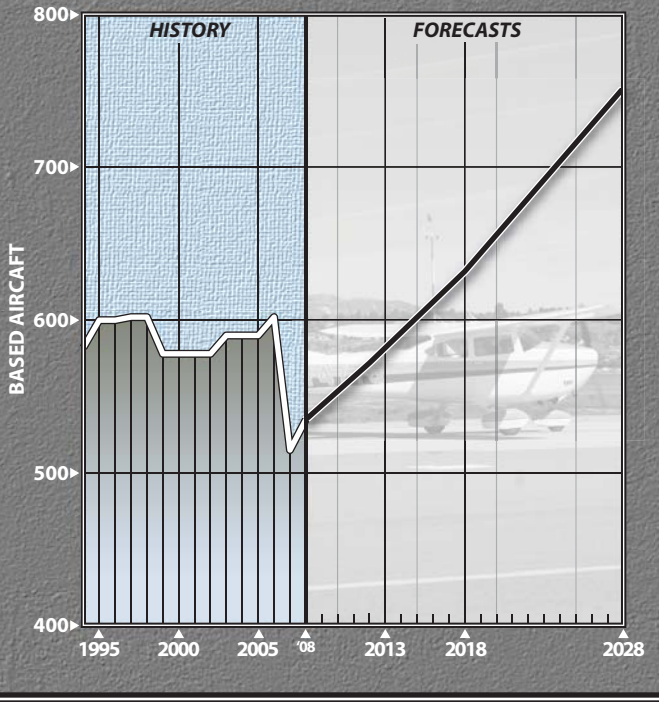


Exhibit 2F
FORECAST SUMMARY

CHAPTER THREE

AIRPORT FACILITY REQUIREMENTS

CHAPTER THREE

AIRPORT FACILITY REQUIREMENTS

To properly plan for the future of Camarillo Airport (CMA), it is necessary to translate forecast aviation demand into the specific types and quantities of facilities that can adequately serve this identified demand. In this chapter, existing components of the airport are evaluated so that the capacities of the overall system are identified. Once identified, the existing capacity is compared to the forecast activity levels to determine where deficiencies currently exist or may be expected to materialize in the future. Once deficiencies in a component are identified, a more specific determination of the approximate sizing and timing of the new facilities can be made.

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

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

Landside facilities are needed for the interface between air and ground transportation modes. This includes components for general aviation needs such as:

- General Aviation Terminal Spaces
- Aircraft Hangars
- Aircraft Parking Aprons
- Auto Parking and Access
- Airport Support Facilities

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

PLANNING HORIZONS

Cost-effective, safe, efficient, and orderly development of an airport should rely more on actual demand at an airport than a time-based forecast figure. Thus, in order to develop a Master Plan that is demand-based rather than time-based, a series of planning horizon milestones have been established that take into consideration the reasonable range of aviation demand projections.

It is important to consider that over time, the actual activity at the airport may be higher or lower than what the annualized forecast portrays. By planning according to activity milestones, the resulting plan can accommodate unexpected shifts or changes in the aviation demand. It is important to plan for these milestones so that airport officials can respond to unexpected changes in a timely fashion. As a result, these milestones provide flexibility and potentially extend this plan's useful life should aviation trends slow over time.

The most important reason for utilizing milestones is to allow the airport to develop facilities according to need generated by actual demand levels. The demand-based schedule provides flexibility in development, as the schedule can be slowed or expedited according to actual demand at any given time over the planning period. The resulting plan provides airport officials with a financially responsible and needs-based program. **Table 3A** presents the planning horizon milestones for each activity demand category. The planning milestones of short, intermediate, and long term generally correlate to the five, ten, and twenty-year periods used in the previous chapter.

TABLE 3A
Planning Horizon Activity Summary
Camarillo Airport

	2007	Short Term	Intermediate Term	Long Term
Itinerant Operations				
General Aviation	70,190	88,000	94,000	106,900
Air Taxi	2,249	2,640	3,310	5,130
Military	101	200	200	200
Total Itinerant	72,540	90,840	97,510	112,230
Local Operations				
General Aviation	66,788	61,200	68,100	84,000
Military	620	500	500	500
Total Local	67,408	61,700	68,600	84,500
TOTAL ANNUAL OPERATIONS	139,948	152,540	166,110	196,730
TOTAL BASED AIRCRAFT	**533**	**570**	**630**	**750**

AIRFIELD PLANNING CRITERIA

The selection of appropriate Federal Aviation Administration (FAA) design standards for the development and location of airport facilities is based primarily upon the characteristics of the aircraft which are currently using or are expected to use the airport. The critical design aircraft is used to define the design parameters for the airport. The critical design aircraft is defined as the most demanding category of aircraft, or family of aircraft, which conducts at least 500 operations per year at the airport. Planning for future aircraft use is of particular importance since design standards are used to plan many airside and landside components. These future standards must be considered now to ensure that short term development does not preclude the long range potential needs of the airport.

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

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

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

The airplane design group (ADG) is based upon either the aircraft's wingspan or tail height, whichever is greater. For example, an aircraft may fall in ADG II for wingspan at 70 feet, but ADG III for tail height at 33 feet. This aircraft would be classified under ADG III. The six ADGs used in airport planning are as follows:

ADG	Tail Height (feet)	Wingspan (feet)
I	<20	<49
II	20 - <30	49 - <79
III	30 - <45	79 - <118
IV	45 - <60	118 - <171
V	60 - <66	171 - <214
VI	66 - <80	214 - <262

Source: AC 150/5300-13, Change 13 (March 2007)

Exhibit 3A summarizes representative aircraft by ARC. As shown on the exhibit, the airport does not currently, nor is it expected to, regularly serve aircraft in ARCs C-IV, D-IV, or D-V.

06MP19-3A-07/03/08

A-I

- Beech Baron 55
- Beech Bonanza
- Cessna 150
- Cessna 172
- Cessna Citation Mustang
- **Eclipse 500**
- Piper Archer
- Piper Seneca

B-I *less than 12,500 lbs.*

- Beech Baron 58
- Beech King Air 100
- Cessna 402
- **Cessna 421**
- Piper Navajo
- Piper Cheyenne
- Swearingen Metroliner
- Cessna Citation I

B-II *less than 12,500 lbs.*

- **Super King Air 200**
- Cessna 441
- DHC Twin Otter

B-I, B-II *over 12,500 lbs*

- Super King Air 300
- Beech 1900
- Jetstream 31
- Falcon 10, 20, 50
- Falcon 200, 900
- **Citation II**, III, IV, V
- Saab 340
- Embraer 120

A-III, B-III

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

C-I, D-I

- Beech 400
- **Lear** 25, 31, **35**, 45, 55, 60
- Israeli Westwind
- HS 125-400, 700

C-II, D-II

- Cessna Citation III, VI, VIII, X
- **Gulfstream** II, III, **IV**
- Canadair 600
- ERJ-135, 140, 145
- CRJ-200, 700, 900
- Embraer Regional Jet
- Lockheed JetStar
- Super King Air 350

C-III, D-III

- ~~ERJ 170, 190~~
- ~~Boeing Business Jet~~
- ~~B 727-200~~
- ~~**B 737-300 Series**~~
- ~~MD-80, DC-9~~
- ~~Fokker 70, 100~~
- ~~A319, A320~~
- Gulfstream V
- Global Express

C-IV, D-IV

- ~~**757**~~
- ~~767~~
- ~~C-130~~
- ~~DC-870~~
- ~~DC-10~~
- ~~MD-11~~
- ~~L1011~~

D-V

- ~~**B-747** Series~~
- ~~B-777~~

Note: Aircraft pictured is identified in bold type.

CAMARILLO AIRPORT

Exhibit 3A
AIRPORT REFERENCE CODES

These are large transport aircraft commonly used by commercial air carriers and air cargo carriers, which do not currently use, nor are they expected to use, Camarillo Airport through the planning period.

The FAA recommends designing airport functional elements to meet the requirements for the most demanding ARC for that airport. The majority of aircraft currently operating at the airport are small single engine aircraft weighing less than 12,500 pounds. The airport also has a significant volume of corporate aircraft ranging from the smaller Cessna Citation family to the Bombardier Global Express and Gulfstream business jet family of aircraft, which can weigh more than 90,000 pounds and range up to ARC D-III.

In order to determine airfield design requirements, the critical aircraft and critical ARC should first be determined, and then appropriate airport design criteria can be applied. This process begins with a review of aircraft currently using the airport and those expected to use the airport through the long term planning period.

CURRENT CRITICAL AIRCRAFT

The critical design aircraft is defined as the most demanding category of aircraft which conduct 500 or more operations at the airport each year. In some cases, more than one specific make and model of aircraft comprises the airport's critical design aircraft. For example, one category of aircraft may be the most critical in terms of approach speed, while another is most critical in terms of wingspan. Smaller general aviation piston-powered aircraft within approach categories A and B and ADG I conduct the majority of operations at Camarillo Airport. Business turboprops and jets with longer wingspans and higher approach speeds also utilize the airport less frequently. While the airport is used by a number of helicopters, helicopters are not included in this determination as they are not assigned an ARC.

As of June 2008, there were 533 based aircraft at Camarillo Airport. The majority of these are single and multi-engine piston-powered aircraft which fall within approach categories A and B and ADG I. There are 11 turboprop aircraft and 22 jets based at the airport. Representative turboprop aircraft include the Aero Commander 690A, Beechcraft King Air, and vintage aircraft including a Convair 240. These aircraft range from ARC B-I (Aero Commander) to B-III (Convair 240).

There is a wider divergence of aircraft types when considering the airport's 22 based jets. These range from smaller Cessna Citations (ARC B-I) to foreign made military trainers to large business jets in the Bombardier and Gulfstream families. The most demanding jet aircraft based at the airport, according to ARC, is the Gulfstream V (G-V) business jet which falls within ARC D-III. There are two G-V aircraft based at CMA. The airport is also home to a G-III (ARC C-II), G-IV (ARC D-II), and Global Express (ARC C-III) business jet aircraft. Be-

fore making a final determination of the critical aircraft family, an examination of the itinerant jet aircraft using the airport should also be considered.

Jet Aircraft Operations

A wide range of transient jet aircraft operate at the airport. Jet operations are typically those that will influence required airport facilities as the critical aircraft. In order to discern the number and type of jet aircraft operations at Camarillo Airport, an analysis of instrument flight plan data was conducted. Flight plan data was acquired for this study from two sources; the FAA Enhanced Traffic Management System Counts (ETMSC) and the subscription service, *Airport IQ*. The data available includes documentation of instrument flight plans that are opened and closed on the ground at the airport. Flight plans that are opened or closed from the air are not credited to the airport. Therefore, it is likely that there are more jet operations at the airport that are not captured by the methodology.

Table 3B presents private jet operations at Camarillo Airport from June 1, 2007, to May 31, 2008 (12-month operational count). The privately owned and operated aircraft are not flown under Federal Aviation Regulation (F.A.R.) Part 135 (considered air taxi). These operations would be considered itinerant general aviation operations.

There were a total of 3,202 operations by privately owned jet aircraft included in the FAA data. The greatest number of operations in any single ARC family was 1,523 in ARC B-II. This number accounted for nearly half of the total, at 47.6 percent of the total.

The table also presents the number of operations by specific aircraft type. The Hawker 800 model performed the most jet operations (402) at the airport over the period. The most demanding privately operated aircraft, in terms of ARC design standard, has been the Gulfstream V. The Gulfstream V is classified by the FAA as ARC D-III and conducted 243 operations at CMA over the last year. The Global Express, an ARC C-III aircraft, is similarly sized and conducted 113 operations at CMA during the period.

Another segment of corporate aircraft users operate under F.A.R. Part 135 (air taxi) rules for hire and through fractional ownership programs. Air taxi operators are governed by the FAA rules which are more stringent than those required for private aircraft owners. For example, aircraft operating under Part 135 rules must increase their calculated landing length requirements by 20 percent for safety factors. Fractional ownership operators are actual aircraft owners who acquire a portion of an aircraft with the ability to use any aircraft in the program's fleet. These programs have become quite popular over the last several years, especially since 9/11. Some of the most notable fractional ownership programs include NetJets, Bombardier Flexjet, Citation Shares, and Flight Options.

TABLE 3B
Private Jet Operations (Minimum)
Camarillo Airport
June 1, 2007 - May 31, 2008

ARC	Aircraft Type	Annual Operations	%
B-I	Eclipse 500	29	0.9%
	Diamond Jet	3	0.1%
	Cessna Mustang	12	0.4%
	Cessna 500	42	1.3%
	Premier 390	60	1.9%
	Falcon 10	8	0.2%
Total B-I		**154**	**4.8%**
B-II	Cessna 525	364	11.4%
	Cessna 550	236	7.4%
	Cessna 560	166	5.2%
	Falcon 20	30	0.9%
	Falcon 50	121	3.8%
	Falcon 900	163	5.1%
	Falcon 2000	28	0.9%
	Hawker 600	13	0.4%
	Hawker 800	402	12.6%
Total B-II		**1,523**	**47.6%**
C-I	Lear 24/5	2	0.1%
	Lear 31/5	30	0.9%
	Lear 40/5	119	3.7%
	Lear 55	20	0.6%
	IAI 1121 Commodore	6	0.2%
	IAI Westwind/Astra	19	0.6%
	Beech 400	44	1.4%
Total C-I		**240**	**7.5%**
C-II	Cessna 650/80	122	3.8%
	Cessna 750 (X)	68	2.1%
	Gulfstream III	101	3.2%
	Sabre 75	3	0.1%
	Hawker 1000	14	0.4%
	CRJ 200/Challenger 800	4	0.1%
	Challenger 300	7	0.2%
	Challenger 600	269	8.4%
	Embraer 135/140 Legacy	10	0.3%
Total C-II		**598**	**18.7%**
C-III	Bombardier Global Express	113	3.5%
Total C-III		**113**	**3.5%**
D-I	Lear 60	31	1.0%
Total D-I		**31**	**1.0%**
D-II	Gulfstream II	60	1.9%
	Gulfstream IV	240	7.5%
Total D-II		**300**	**9.4%**
D-III	Gulfstream V	243	7.6%
Total D-III		**243**	**7.6%**
TOTAL ACTIVITY		***3,202***	***100.0%***

Source: FAA ETMSC Report and AirportIQ.com based on IFR filing data

From June 1, 2007, to May 31, 2008, air taxi and fractional ownership operators accounted for an additional 1,090 jet operations. **Table 3C** provides additional information regarding the ARC and model type of aircraft utilized by the fractional and charter companies which operated at Camarillo Airport over the last year.

TABLE 3C
Air Taxi Jet Operations (Minimum)
Camarillo Airport
June 1, 2007 - May 31, 2008

ARC	Aircraft Type	Annual Operations	%
Total B-I		**0**	**0.0%**
B-II	Cessna 525	8	0.7%
	Cessna 550	14	1.3%
	Cessna 560	435	39.9%
	Falcon 20	1	0.1%
	Falcon 2000	56	5.1%
	Hawker 800	118	10.8%
Total B-II		**632**	**58.0%**
C-I	Lear 40/5	40	3.7%
	Beech 400	101	9.3%
Total C-I		**141**	**12.9%**
C-II	Cessna 650/80	98	9.0%
	Cessna 750 (X)	139	12.8%
	Challenger 300	22	2.0%
	Challenger 600	3	0.3%
	Embraer 135/140 Legacy	10	0.9%
Total C-II		**272**	**25.0%**
Total C-III		**0**	**0.0%**
D-I	Lear 60	10	0.9%
Total D-I		**10**	**0.9%**
D-II	Gulfstream II	35	3.2%
Total D-II		**35**	**3.2%**
Total D-III		**0**	**0.0%**
Total Activity		**1,090**	**100.0%**

Source: FAA ETMSC Report and AirportIQ.com based on IFR filing data

The combination of private and air taxi jet and turboprop operations accounted for a minimum of 4,292 itinerant operations at Camarillo Airport over the last year, as presented in **Table 3D**. Based upon these figures, operations by jet aircraft within ARC C-II exceed the substantial use threshold of 500 operations per year to be considered the current critical design aircraft. While ARC B-II aircraft totaled approximately 50 percent of all operations used in this analysis, ARC C-II aircraft accounted for an additional 20 percent of the total operational count.

As previously mentioned, critical aircraft design does not necessarily require one aircraft which makes the 500 annual operations. In many cases, a family of aircraft within the same ARC can define the critical aircraft.

As such, consideration should be given to the operations by the most demanding aircraft to determine if the threshold has been exceeded. Over the last year, jet aircraft operations at CMA in approach categories D-I through D-III combined for more then 500 annual operations. Thus, the critical approach category is D. Aircraft in airplane design group II also accounted for more than 500 annual operations. Therefore, the current critical design aircraft for Camarillo Airport is defined by cabin-class aircraft in ARC D-II.

TABLE 3D
Minimum Itinerant Jet Operations by ARC
Camarillo Airport

Aircraft Reference Code (ARC)	Private Jet Ops	Air Taxi Jet Ops	Total
B-I	154	0	154
B-II	1,523	632	2,155
C-I	240	141	381
C-II	598	272	870
C-III	113	0	113
D-I	31	10	41
D-II	300	35	335
D-III	243	0	243
Totals	**3,202**	**1,090**	**4,292**

Source: FAA ETMSC Report and AirportIQ

FUTURE CRITICAL AIRCRAFT

The aviation demand forecasts indicate the potential for continued growth in business jet and turboprop aircraft activity at the airport. This includes the addition of 23 based jets and eight based turboprops through the long term planning period. Itinerant business jet and turboprop activity is also expected to continue to be strong. Therefore, it is expected that business jet and turboprop aircraft will continue to define the critical aircraft parameters for Camarillo Airport through the planning period.

Camarillo Airport is fully capable of serving the full breadth of piston-powered and turboprop general aviation aircraft. The airport is also capable of serving the full array of business jet aircraft in the fleet today as evidenced by the G-V and Global Express which are currently based at CMA. Future business jet aircraft which will base and operate at CMA will likely mirror current conditions, however, in higher volumes.

The G-V and Global Express represent the largest commonly used business jets in the fleet today. Both of these aircraft are currently based at the airport, however, their operations fell short of the 500 operation threshold. In the near future, however, these aircraft will likely operate more than 500 times annually at CMA. As such, the future critical aircraft for planning purposes will remain ARC D-III defined by the G-V and Global Express business jet aircraft.

AIRFIELD CAPACITY

Airfield capacity is measured in a variety of different ways. The **hourly capacity** of a runway measures the maximum number of aircraft operations that can take place in an hour. The **annual service volume (ASV)** is an annual level of service that may be used to define airfield capacity needs. **Aircraft delay** is the total delay incurred by aircraft using the airfield during a given timeframe. FAA Advisory Circular 150/5060-5, *Airport Capacity and Delay*, provides a methodology for examining the operational capacity of an airfield for planning purposes. This analysis takes into account specific factors about the airfield. These various factors are depicted in **Exhibit 3B**. The following describes the input factors as they relate to Camarillo Airport:

- **Runway Configuration** – The existing airfield configuration consists of a single runway with a full length parallel taxiway. Runway 8-26 is 6,013 feet long by 150 feet wide.

- **Runway Use** – Runway use in capacity conditions will be controlled by wind and/or airspace conditions. For Camarillo Airport, the direction of take-offs and landings are generally determined by the speed and direction of the wind. It is generally safest for aircraft to takeoff and land into the wind, avoiding a crosswind (wind that is blowing perpendicular to the travel of the aircraft) or tailwind components during these operations. Based upon information received from the airport traffic control tower (ATCT) and wind data obtained for the area, Runway 26 is utilized approximately 70 percent of the time. Both ends of the runway are served by at least one published instrument approach procedure.

- **Exit Taxiways** – Exit taxiways have a significant impact on airfield capacity since the number and location of exits directly determines the occupancy time of an aircraft on the runway. The airfield capacity analysis gives credit to exits located within the prescribed range from a runway's threshold. This range is based upon the mix index of the aircraft that use the runways. For Camarillo Airport, those exit taxiways located between 2,000 and 4,000 feet of the landing threshold count in the capacity determination. The exits must be at least 750 feet apart to count as separate exits. Under this criteria, there are two exits available within this range.

- **Weather Conditions** – The airport operates under visual meteorological conditions (VMC) 85 percent of the time. Instrument meteorological conditions (IMC) occur when cloud ceilings are between 500 and 1,000 feet, approximately nine percent of the year. Poor visibility conditions (PVC) apply for minimums below 500 feet and one mile. PVC conditions occur approximately six percent of the year.

- **Aircraft Mix** – Aircraft mix for the capacity analysis is defined in terms of four aircraft classes. Classes A and B consist of small and medium-sized propeller and

AIRFIELD LAYOUT

Runway Configuration

Runway Use

Number of Exits

WEATHER CONDITIONS

VMC

IMC

PVC

AIRCRAFT MIX

A&B

C

D

OPERATIONS

Arrivals and Departures

Total Annual Operations

Touch-and-Go Operations

CAMARILLO AIRPORT

Exhibit 3B
AIRFIELD CAPACITY FACTORS

some jet aircraft, all weighing 12,500 pounds or less. These aircraft are associated primarily with general aviation activity, but do include some air taxi, air cargo, and commuter aircraft. Class C consists of aircraft weighing between 12,500 pounds and 300,000 pounds. These aircraft include most business jets and some turboprop aircraft. Class D aircraft consists of large aircraft weighing more than 300,000 pounds. These aircraft are associated with airline and air cargo activities, and include the DC-10, Boeing 767, and Boeing 747. The airport does not experience operations by Class D aircraft. A description of the classifications and the percentage mix for each planning horizon is presented in **Table 3E**.

TABLE 3E
Aircraft Operational Mix - Capacity Analysis
Camarillo Airport

Aircraft Classification	Current	Short Term	Intermediate Term	Long Term
VFR				
Classes A & B	93.6%	92.8%	91.6%	89.6%
Class C	6.4%	7.2%	8.4%	10.4%
Class D	0%	0%	0%	0%
Percent Local Operations (Touch-and-Go's)	48%	40%	41%	43%

Definitions: Class A: Small single engine aircraft with gross weights of 12,500 pounds or less
Class B: Small twin-engine aircraft with gross weights of 12,500 pounds or less
Class C: Large aircraft with gross weights over 12,500 pounds up to 300,000 pounds
Class D: Large aircraft with gross weights over 300,000 pounds

- **Percent Arrivals** – Generally follows the typical 50/50 percent split.

- **Touch-and-Go Activity** – Percentages of touch-and-go activity are presented in **Table 3E**. Current local operations account for 48 percent of total annual operations. This figure will likely decrease in the short term due to fuel costs and the recession, but will gradually and slightly increase over the period.

- **Peak Period Operations** – For the airfield capacity analysis, average daily operations and average peak hour operations during the peak month, as calculated in the previous section, are utilized. Typical operations activity is important in the calculation of an airport's annual service volume as "peak demand" levels occur sporadically. The peak periods used in the capacity analysis are representative of normal operational activity and can be exceeded at various times throughout the year.

CALCULATION OF ANNUAL SERVICE VOLUME

The preceding information was used in conjunction with the airfield capacity methodology developed by the FAA to determine airfield capacity for Camarillo Airport.

Hourly Runway Capacity

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

Based upon the input factors, current and future hourly capacities at Camarillo Airport were determined. As the mix of aircraft operating at an airport changes to include a higher percentage of large aircraft weighing over 12,500 pounds, the hourly capacity of the system declines slightly. As indicated in **Table 3E**, the percentages of Class C aircraft will increase with the planning horizon activity milestones. This results in a slight decline in the hourly capacity. This progression would be representative as corporate aircraft operations will likely increase at a greater rate than other general aviation operations.

The current and future hourly capacities are depicted in **Table 3F**. At Camarillo Airport, the current hourly capacity is 101 operations. This is expected to decline to 93 operations by the long term horizon based on projected operations.

Annual Service Volume

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

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

The ratio of annual demand to average daily demand (D) was determined to be 316 for Camarillo Airport. This is expected to increase slightly over the long range planning period. The ratio of average daily demand to average peak hour demand (H) was determined to be 6.8. This ratio was projected to increase to 7.6 by the long term planning horizon.

The current ASV was determined to be 215,900 operations. As peaks spread, becoming less concentrated with increased operations, the ASV will tend to increase, resulting in an annual service volume of 226,700 by the long term planning horizon. With operations in 2007 totaling 139,948, the airport is currently at 64.8 percent of its annual service volume. Long range annual operations are forecast to reach nearly 196,730 operations, which would be 86.8 percent of the airport's ASV. **Table 3F** summarizes the airport's ASV over the long range planning horizon.

Aircraft Delay

As the number of annual aircraft operations approaches the airfield's ca-

pacity, increasing operational delays begin to occur. Delays occur to arriving and departing aircraft in all weather conditions. Arriving aircraft delays result in aircraft holding outside the airport traffic area. Departing aircraft delays result in aircraft holding until released by air traffic control.

Table 3F summarizes the aircraft delay analysis conducted for Camarillo Airport. Current annual delay is estimated at 0.6 minutes per aircraft operation or 1,399 annual hours. As an airport's operations near the annual service volume, delays increase exponentially. Analysis of delay factors for the long range planning horizon indicates that annual delays can be expected to reach 4,262 hours, or 1.3 minutes per aircraft operation.

TABLE 3F
Airfield Demand/Capacity Summary
Camarillo Airport

	Current	Short Term	Intermediate Term	Long Term
Operational Demand				
Annual	139,948	152,540	166,110	196,730
Design Hour	71	83	90	107
Capacity				
Annual Service Volume	215,900	218,000	221,400	226,700
Percent Capacity	64.8	70.0	75.0	86.8
Weighted Hourly Capacity	101	99	97	93
Delay				
Per Operation (Minutes)	0.6	0.8	0.9	1.3
Total Annual (Hours)	1,399	2,034	2,492	4,262

CAPACITY ANALYSIS CONCLUSIONS

Exhibit 3C compares annual service volume to existing and forecast operational levels at Camarillo Airport. The current operations level represents 64.8 percent of the airfield's annual service volume. By the end of the planning period, total annual operations are expected to represent 86.8 percent of annual service volume.

FAA Order 5090.3B, *Field Formulation of the National Plan of Integrated Airport Systems* (NPIAS), indicates that improvements for airfield capacity purposes should begin to be considered once operations reach 60 to 75 percent of the annual service volume. This is an approximate level to begin the detailed planning of capacity improvements. This range has been reached and could be exceeded by the short term planning horizon. An example of a capacity improvement would include relatively minor improvements such as additional taxiway exits to more substantial and effective improvements such as a parallel runway. While additional taxiway exits can improve capacity, they generally do not significantly reduce delay. Since the projected operations will exceed 80 percent of the ASV by the long term, more significant options

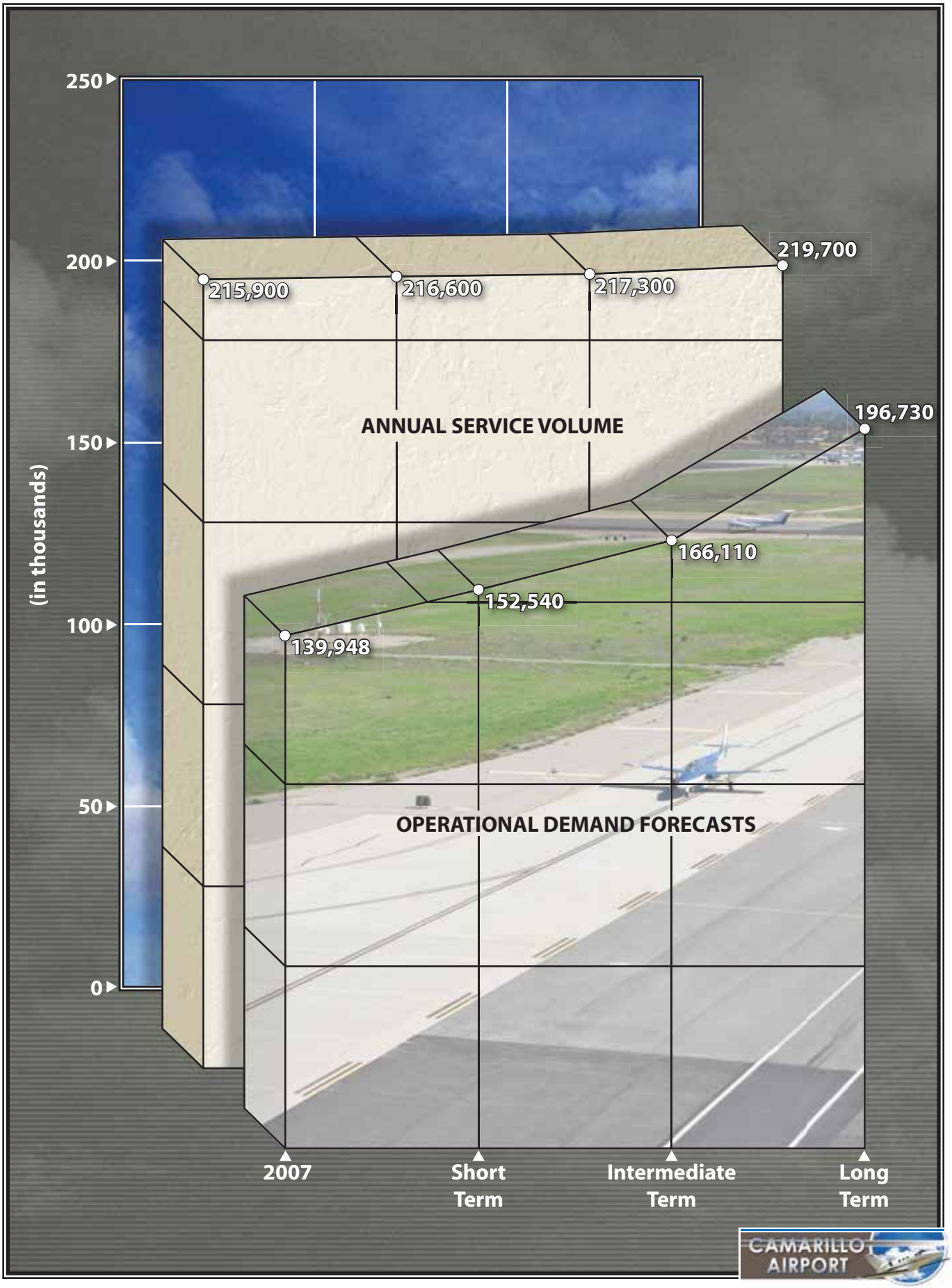


Exhibit 3C
ANNUAL SERVICE VOLUME

should be planned. As a result, the option of developing a parallel runway to serve small aircraft and training operations will be considered. This option will be further evaluated in the alternatives analyses of the next chapter.

AIRFIELD REQUIREMENTS

Airfield requirements include the need for those facilities related to the arrival and departure of aircraft. The adequacy of existing airfield facilities at Camarillo Airport has been analyzed from a number of perspectives, including:

- Runways
- Safety Area Design Standards
- Taxiways
- Airfield Lighting, Marking, and Signage
- Navigational Aids and Instrument Approach Procedures

RUNWAYS

Runway conditions such as orientation, length, pavement strength, width, and safety standards at Camarillo Airport were analyzed. From this information, requirements for runway improvements were determined for the airport.

Runway Orientation

The airport is served by single runway orientated in an east/west manner. For the operational safety and efficiency of an airport, it is desirable for the primary runway to be orientated as close as possible to the direction of the prevailing wind. This reduces the impact of wind components perpendicular to the direction of travel of an aircraft that is landing or taking off (defined as a crosswind).

FAA Advisory Circular 150/5300-13, Change 13, *Airport Design*, recommends that a crosswind runway should be made available when the primary runway orientation provides less than 95 percent wind coverage for specific crosswind components. The 95 percent wind coverage is computed on the basis of the crosswind component not exceeding 10.5 knots (12 mph) for ARC A-1 and B-I; 13 knots (15 mph) for ARC A-II and B-II; 16 knots (18 mph) for ARC C-I through D-II; and 20 knots for ARC A-IV through D-VI.

Wind data specific for Camarillo Airport is available and is depicted on **Exhibit 3D**. The runway orientation provides 98.27 percent wind coverage for 10.5 knot crosswinds, 99.27 percent wind coverage at 13 knots, and 99.85 percent coverage at 16 knots. The current orientation meets FAA standards for all crosswind components. As a result, no additional runway orientations will be planned.

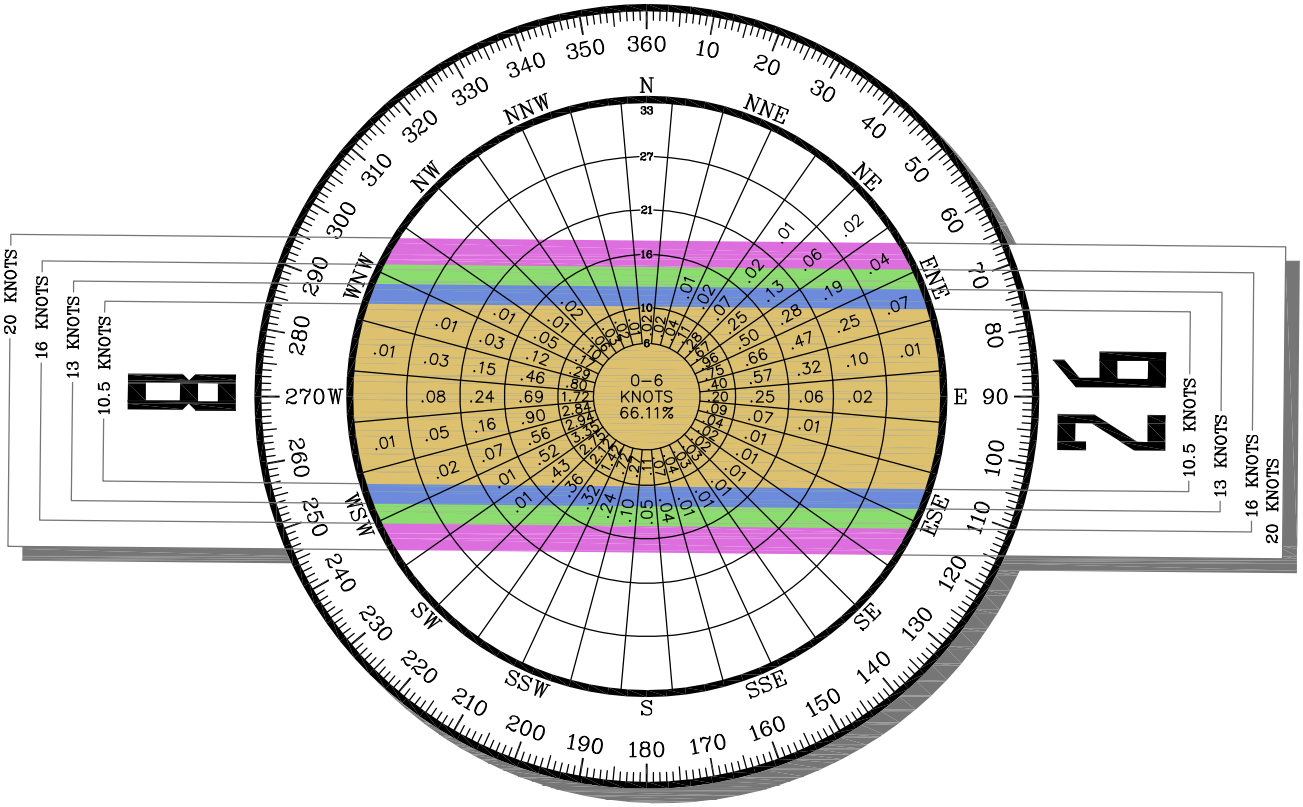
Runway Length

The determination of runway length requirements for the airport is based on five primary factors:

- Mean maximum daily temperature of the hottest month
- Airport elevation

ALL WEATHER WIND COVERAGE

Runways	10.5 Knots	13 Knots	16 Knots	20 Knots
Runway 8–26	*98.27%*	*99.27%*	*99.85%*	*99.96%*



NORTH

Magnetic Variance
13° 06' East (July 2008)
Annual Rate of Change
00° 05' West (July 2008)

SOURCE:
NOAA National Climatic Center
Asheville, North Carolina
Camarillo Airport (CMA)
Camarillo, California

OBSERVATIONS:
80,352 All Weather Observations
1998–2007

CAMARILLO AIRPORT

Exhibit 3D
WIND ROSE

- Runway gradient
- Critical aircraft type expected to use the airport
- Stage length of the longest nonstop trip destination (specific to larger aircraft)

The mean maximum daily temperature of the hottest month for Camarillo Airport is 72 degrees Fahrenheit (F). The airport elevation is 77.4 feet above mean sea level (MSL). The maximum runway end elevation difference is 11 feet. Runway 8-26 has a longitudinal gradient of 0.23 percent, which conforms to FAA design standards. For aircraft in approach categories A and B, the runway longitudinal gradient cannot exceed two percent. For aircraft in approach categories C and D, the maximum allowable longitudinal runway gradient is 1.5 percent.

Table 3G outlines the runway length requirements for various classifications of general aviation aircraft at Camarillo Airport. These were derived utilizing the FAA Airport Design Computer Program for *Runway Lengths Recommended for Airport Design*. These runway lengths are based upon groupings or families of aircraft. As discussed earlier, the runway design required should be based upon the most critical family with at least 500 annual operations.

TABLE 3G
Runway Length Requirements
Camarillo Airport

Airport and Runway Data	
Airport Elevation	1,394 feet MSL
Mean daily maximum temperature of the hottest month	106 degrees F
Maximum difference in runway centerline elevation	29 feet
Length of haul for airplanes of more than 60,000	1,000 miles
Wet and Slippery Runways	
Runway Length Recommended for Airport Design	
Small airplanes with less than 10 passenger seats	
75 percent of these small airplanes	2,400 feet
95 percent of these small airplanes	2,900 feet
100 percent of these small airplanes	3,500 feet
Small airplanes with 10 or more passenger seats	4,000 feet
Large airplanes of 60,000 pounds or less	
75 percent of business jets at 60 percent useful load	5,300 feet
75 percent of business jets at 90 percent useful load	6,600 feet
100 percent of business jets at 60 percent useful load	5,500 feet
100 percent of business jets at 90 percent useful load	7,100 feet
Airplanes weighing more than 60,000 pounds	6,000 feet

Source: FAA Airport Design Computer Program utilizing Chapter Two of AC 150/5325-4A, *Runway Length Requirements for Airport Design*

The category of "100 percent of business jets with 60 percent useful load" generally corresponds to this ARC C/D-II aircraft. As presented in the

table, a runway length of at least 5,500 feet is required to accommodate this aircraft category.

The table indicates that aircraft weighing more than 60,000 pounds with a 1,000 mile stage length require 6,000 feet of runway length. This category includes the Gulfstream family of business jets as well as the Global Express. Longer stage lengths generally require longer take-off lengths as more fuel is required, thus increasing take-off weights. If the stage length is increased to 1,500 feet, the required runway length increases to 6,900 feet.

Runway 8-26

Runway 8-26 is currently 6,013 feet long. This length is more than adequate to accommodate the majority of current and future aircraft operations. Review of the jet operations for the airport over the last year reveals that many aircraft operators have left CMA with destinations of over 1,000 miles. Examples of destinations for jet operators include Midwestern cities such as Minneapolis, Dallas, and Chicago, as well as east coast cities such as Teterboro, New Jersey and Palm Beach, Florida. It should be clearly noted, however, that the majority of business jet operations had destinations within 1,000 miles.

While a longer runway could be desirable for some aircraft operators, it is not needed for the majority of aircraft operations at CMA. Moreover, the City of Camarillo and Ventura County have agreed to keep the runway at its current length under the original joint powers agreement. The current runway is fully capable of meeting the needs of the majority of aircraft operators. Those that have longer stage lengths can operate from CMA, but they may have to make a fuel stop along their route. Thus, Runway 8-26 should be maintained at its current length in the future.

Parallel Runway

Capacity analysis presented earlier in the chapter indicated that projected aviation demand would exceed 80 percent of the calculated ASV by the long range of the planning period. The increased use of the airport by business jets will tax airfield capacity and increase airport delays through the planning period. The FAA stipulates that plans should be made to improve capacity when operations reach 60 percent of the airfield ASV. At the 80 percent level, these improvements should be made. The most significant airfield capacity enhancement that can be made is the addition of a parallel runway. Generally, adding a parallel runway can nearly double the airfield's capacity. For these reasons, a parallel runway concept should be considered within this planning study.

A parallel runway at CMA should be developed to accommodate small aircraft and training operations. Shifting the training and small aircraft operations to the parallel runway will provide greater capacity for the existing runway allowing it to better serve larger aircraft. Based on the information provided in **Table 3G**, the parallel runway should be planned to provide for a minimum of 100 percent of

all small aircraft up to all small aircraft with 10 or fewer passenger seats. Thus, the plan should consider developing a parallel runway that is at least 3,500 feet long. Moreover, FAA criteria requires a parallel runway be separated from an existing runway by at least 700 feet. Analysis in the following chapter will present parallel runway development options.

Runway Width

Runway 8-26 is currently 150 feet wide. FAA design standards call for a runway width of at least 100 feet to serve aircraft through ARC D-III. Runway 8-26 currently meets FAA criteria for runway width and should be maintained in the future. The proposed parallel runway should be designed to meet FAA ARC B-II width standards of 75 feet.

The runway shoulder width for Group III aircraft is 20 feet on both sides. The shoulder areas provide resistance to blast erosion and must be capable of accommodating emergency and maintenance vehicles as well as the occasional passage of an aircraft veering from the primary runway surfaces. Typically, runway shoulders are paved surfaces, as is the case at Camarillo Airport. The existing runway shoulders meet FAA standards and should be maintained in the future.

Runway Strength

The officially published pavement strength rating for Runway 8-26 is 50,000 pounds single wheel loading (SWL). As previously mentioned, SWL refers to the aircraft weight based upon the landing gear configuration with a single wheel on each landing strut. The strength rating for dual wheel configurations (DWL) is 80,000 pounds, and 125,000 pounds for dual tandem wheel loading (DTWL). DWL and DTWL include the design of aircraft landing gear with additional wheels on each landing gear strut which distributes more of the aircraft weight on the runway and taxiway surfaces; thus, the surface itself can support a greater total aircraft weight.

The strength rating of a runway does not preclude aircraft weighing more than the published strength rating from using the runway. All federally obligated airports must remain open to the public, and it is typically up to the pilot of the aircraft to determine if a runway can support their aircraft safely. An airport sponsor cannot restrict an aircraft from using the runway simply because its weight exceeds the published strength rating. On the other hand, the airport sponsor has an obligation to properly maintain the runway and protect the useful life of the runway, typically for 20 years.

According to the FAA publication *Airport/Facility Directory*, "Runway strength-rating is not intended as a maximum allowable weight or as an operating limitation. Many airport pavements are capable of supporting limited operations with gross weights in excess of the published figures." The directory goes on to say that those aircraft exceeding the pavement strength should contact the airport

sponsor for permission to operate at the airport.

The strength rating of a runway can change over time. Regular usage by heavier aircraft can decrease the strength rating, while periodic runway resurfacing can increase the strength rating. The current strength rating of Runway 8-26 is adequate to serve the majority of aircraft operations at the airport. The G-V and Global Express aircraft have maximum gross weights of up to 94,000 pounds, exceeding the 80,000 pound DWL rating of the runway. This difference is not substantial, nor are the annual operations by these aircraft. Consideration could be given to increasing the DWL rating to 100,000 pounds when the next runway rehabilitation project is undertaken.

The proposed parallel runway should be planned for small aircraft operations. The minimum pavement strength that should be considered would be 12,500 pounds SWL.

Runway/Taxiway Separation

FAA AC 150/5300-13, *Airport Design*, Change 13, also discusses separation distances between aircraft and various areas on the airport. The separation distances are a function of the approaches approved for the airport and the runway's designated ARC. Under current conditions (ARC D-II and approaches not lower than three-quarters of a mile), parallel taxiways need to be at least 400 feet from the Runway 8-26 centerline. Aircraft parking areas are required to be at least 500 feet from the runway centerline.

Currently, parallel Taxiway F is located 1,000 feet south of the Runway 8-26 centerline. The aircraft parking apron is located approximately 1,100 feet from the runway centerline. These distances far exceed FAA standards.

The plan will consider the implementation of a parallel runway. Based on the location of the proposed taxiway, a new parallel taxiway serving runway 8-26 could be required. If a new parallel taxiway is required, it should be located no nearer than 400 feet from existing Runway 8-26. Moreover, it should be located no nearer than 300 feet from the proposed parallel runway to fully meet ARC B-II aircraft standards.

Runway Blast Pad

The blast pad is a surface adjacent to the ends of the runways provided to reduce the erosive effect of jet blast and propeller wash. Runway 8-26 is equipped with blast pads off each end which were the result of the previous runway which was shortened due to the City-County operational agreement. These areas exceed FAA standards and should be maintained in the future.

SAFETY AREA DESIGN STANDARDS

The FAA has established several safety surfaces to protect aircraft opera-

tional areas and keep them free from obstructions that could affect the safe operation of aircraft. These include the runway safety area (RSA), object free area (OFA), obstacle free zone (OFZ), and runway protection zone (RPZ). The dimensions of these safety areas are dependent upon the critical aircraft and, thus, the ARC of the runway.

Runway Safety Area (RSA)

The RSA is defined in FAA Advisory Circular 150/5300-13, Change 13, *Airport Design*, as a "surface surrounding the runway prepared or suitable for reducing the risk of damage to airplanes in the event of an undershoot, overshoot, or excursion from the runway." The RSA is centered on the runway, dimensioned in accordance to the approach speed of the critical aircraft using the runway. The FAA requires the RSA to be cleared and graded, drained by grading or storm sewers, capable of accommodating the design aircraft and fire and rescue vehicles, and free of obstacles not fixed by navigational purpose.

The FAA has placed a higher significance on maintaining adequate RSAs at all airports due to recent aircraft accidents. Under Order 5200.8, effective October 1, 1999, the FAA established a *Runway Safety Area Program*. The Order states, "The objective of the Runway Safety Area Program is that all RSAs at federally-obligated airports … shall conform to the standards contained in Advisory Circular 150/5300-13, *Airport Design*, to the extent practicable." Each Regional Airports Division of the FAA is obligated to collect and maintain data on the RSA for each runway at the airport, and perform airport inspections.

For ARC D-II and D-III runways with not lower than three-quarters of a mile approach minimums, the FAA calls for the RSA to be 500 feet wide and extend 1,000 feet beyond each runway end. Runway 8-26 currently meets FAA RSA standards and should be maintained in the future as the critical aircraft is planned to remain ARC D-III.

As previously mentioned, the proposed parallel runway should be planned to fully meet ARC B-II standards. ARC B-II standards for runways providing not lower than three-quarters of a mile visibility minimums require RSAs to be 150 feet wide, extending 300 feet beyond the runway end.

Object Free Area (OFA)

The runway OFA is "a two-dimensional ground area, surrounding runways, taxiways, and taxilanes, which is clear of objects except for objects whose location is fixed by function (i.e., airfield lighting)." The OFA is centered on the runway, extending out in accordance to the critical aircraft design category utilizing the runway.

For ARC D-II and D-III aircraft served by runways having approaches not lower than three-quarters of a mile, the FAA calls for the OFA to be 800 feet wide (centered on the runway), extending 1,000 feet beyond each

runway end. Runway 8-26 currently meets this standard, and it should be maintained in the future.

The proposed parallel runway should be designed to meet FAA ARC B-II OFA standards. For ARC B-II runways having not lower than three-quarters of a mile approach visibility minimums, the OFA should be 500 feet wide and extend 300 feet beyond each runway end.

Obstacle Free Zone (OFZ)

The OFZ is an imaginary surface which precludes object penetrations, including taxiing and parked aircraft. The only allowance for OFZ obstructions is navigational aids mounted on frangible bases which are fixed in their location by function, such as airfield signs. The OFZ is established to ensure the safety of aircraft operations. If the OFZ is obstructed, the airport's approaches could be removed or approach minimums could be increased.

The FAA's criterion for runways utilized by small airplanes (those weighing less than 12,500 pounds) with approach speeds greater than 50 knots requires a clear OFZ to extend 200 feet beyond the runway ends, by 250 feet wide (125 feet on either side of the runway centerline). For runways serving aircraft over 12,500 pounds, the OFZ width increases to 400 feet (200 feet on either side of the runway centerline).

Currently, Runway 8-26 meets FAA standards for the OFZ. The proposed parallel runway should be designed for the 400-foot width to accommodate all ARC B-II aircraft.

Runway Protection Zone (RPZ)

The RPZ is a trapezoidal area centered on the runway, typically beginning 200 feet beyond the runway end. The RPZ has been established by the FAA to provide an area clear of obstructions and incompatible land uses in order to enhance the protection of approaching aircraft, as well as people and property on the ground. The dimensions of the RPZ vary according to the visibility requirements serving the runway and the type of aircraft operating on the runway.

The lowest existing visibility minimum for approaches to the runways at Camarillo Airport is three-quarters of a mile to Runway 26. The corresponding RPZ dimension calls for a 1,000-foot inner width, extending outward 1,700 feet, to a 1,510-foot outer width. For the one-mile visibility approach minimums for Runway 8 and ARC D-II and D-III, the RPZ has an inner width of 500 feet, extending outward 1,700 feet, to an outer width of 1,010 feet.

Future planning should consider improved approach minimums to both Runways 8 and 26. Global positioning system (GPS) technology will likely provide for a full Category I (CAT I) minimum approach providing one-half mile visibility minimums and cloud heights of 200 feet within the scope of this study. To achieve this approach, the airport will not have to install a

traditional ground based system such as the instrument landing system (ILS) as has been the case in the past.

Future planning will consider a full CAT I approach to Runway 26. The corresponding RPZ increases in size to have a 1,000-foot inner width, 1,750-foot outer width, extending 2,500 feet. Runway 8 should be planned for not lower than three-quarters of a mile which has a corresponding RPZ matching the current Runway 26 RPZ. The proposed parallel runway should be planned for ARC B-II aircraft served by a runway with visual or not lower than one mile visibility approaches. The corresponding RPZ has a dimension of 500-foot inner width, 700-foot outer width, extending 1,000 feet.

The existing RPZs for both runways extend beyond the existing property lines. The northeastern corner of the Runway 26 RPZ extends slightly north of current property, while approximately one-fourth of the outer portion of the Runway 8 RPZ extends beyond airport property. The RPZs for both runway ends will extend beyond airport property.

Where possible, the airport should have positive control over the RPZ through fee simple acquisition; however, avigation easements (acquiring control of designated airspace within the RPZ) can be pursued if fee simple acquisition is not feasible. Avigation easements are in place for the areas within the RPZs located outside of airport property. The dimensions for RPZs, considering existing and ultimate ARCs, as well as other airfield planning criteria are detailed in **Table 3H**.

TAXIWAYS

Taxiways are constructed primarily to facilitate aircraft movements to and from the runway system. Some taxiways are necessary simply to provide access between the aprons and runways, whereas other taxiways become necessary as activity increases at an airport to provide safe and efficient use of the airfield.

As detailed in Chapter One, Runway 8-26 is served by a full length parallel taxiway situated 1,000 feet south of the runway (centerline to centerline). **Table 3H** outlines the runway to taxiway centerline separation standards. Taxiway F fully meets the FAA's runway/taxiway separation standards.

Exit taxiways provide a means to enter and exit the runways at various points on the airfield. The type and number of exit taxiways can have a direct impact on the capacity and efficiency of the airport as a whole. Runway 8-26 has a total of five exit taxiways on the south side of the runway linking the runway with Taxiway F.

Exit taxiways are most effective when planned at least 750 feet apart. Potential locations for new exit taxiways that may improve capacity or efficiency will be examined in Chapter Four – Airport Alternatives.

Dimensional standards for the taxiways are depicted on **Table 3H**. All airfield taxiways are at least 50 feet wide. All taxiways meet or exceed Design Group III standards and should be maintained through the planning period. The proposed parallel runway should be served by taxiways that are

at least 35 feet wide to meet ARC B-II standards.

Holding aprons and bypass taxiways can also improve the efficiency of the taxiway system. Currently, holding aprons are provided at both ends of the runway. These facilities should be maintained in the future.

TABLE 3H
Airfield Design Standards
Camarillo Airport

	Existing Runway 8-26		Ultimate Runway 8-26		Proposed Parallel Runway
Airport Reference Code (ARC)	D-II		D-III		B-II
Approach Visibility Minimums	1 Mile	¾ Mile	¾ Mile	CAT I	Visual
Runway Length	6,013'		Same		3,500'
Runway Width	150'		Same		75'
Runway Safety Area					
Width	500'		Same		300
Length Beyond Runway End	1,000'		Same		150
Object Free Area					
Width	800'		Same		300
Length Beyond Runway End	1,000'		Same		500
Obstacle Free Zone					
Width	400'		Same		400'
Length Beyond Runway End	200'		Same		200'
Runway Protection Zone					
Inner Width	500'	1,000'	1,000'	1,000'	500'
Outer Width	1,010'	1,510'	1,510'	1,750'	700'
Length	1,700'	1,700'	1,700'	2,500'	1,000'
Runway Centerline to:					
Holding Position	250'		Same		250'
Parallel Taxiway Centerline	400'		Same		300'
Parallel Runway Centerline	N/A'		700'		700'
Taxiway Width	50		Same		35'
Taxiway Object Free Area Width	186'		Same		131
Taxiway Centerline to:					
Fixed or Moveable Object	93'		Same		65.5

AIRFIELD LIGHTING, MARKING, AND SIGNAGE

There are a number of lighting and pavement marking aids serving pilots using the airport. These aids assist pilots in locating the airport and runway at night or in poor visibility conditions. They also assist in the ground movement of aircraft.

Runway and Taxiway Lighting

Runway identification lighting provides the pilot with a rapid and positive identification of the runway and its alignment. Runway 8-26 is equipped with medium intensity runway lights (MIRL). Medium intensity taxiway lighting (MITL) is provided on all taxiways at the airport. The run-

way and taxiway lighting systems are vital to the airport's operations and should be maintained throughout the planning period. The proposed parallel runway and associated taxiway improvements should also be served by MIRL and MITL respectively.

Airport Identification Lighting

The location of the airport at night is universally indicated by a rotating beacon. For civil airports, a rotating beacon projects two beams of light, one white and one green, 180 degrees apart. At Camarillo Airport, the beacon is located on top of the water tower located at the intersection of Airport Way and Pleasant Valley Road. The beacon is sufficient and should be maintained through the planning period.

Visual Approach Lighting

In most instances, the landing phase of any flight must be conducted in visual conditions. To provide pilots with visual guidance information during landings to the runway, electronic visual approach aids are commonly provided at airports. Currently, both runway ends at Camarillo Airport are equipped with a two-box precision approach path indicator (PAPI-2). Consideration should be given to upgrading to four-box systems. The four-box systems are better to serve the corporate aircraft currently using the airport because they are more visible for faster approaching aircraft. The proposed parallel runway should be served by a two-box system.

Runway End Identification Lighting

Runway end identification lights (REILs) are flashing lights located at each runway end that facilitate identification of the runway end at night or during poor visibility conditions. REILs provide pilots with the ability to identify the runway ends and distinguish the runway end lighting from other lighting on the airport and in the approach areas. The FAA indicates that REILs should be considered for all lighted runway ends not planned for a more sophisticated approach lighting system (ALS).

Currently, REILs are located on each end of Runway 8-26 and should be maintained through the planning period unless Runway 8 was served by a CAT I approach. In order to achieve CAT I minimums, a medium intensity approach lighting system with runway alignment lights (MALSR) is required. Future planning will consider installing a MALSR on Runway 8, while the REIL system on Runway 26 should be adequate for the planning period. The proposed parallel runway should be planned for REIL systems.

Pilot-Controlled Lighting

Camarillo Airport is equipped with pilot-controlled lighting (PCL) for Runway 8-26 after the ATCT is closed. With PCL, a pilot can control airfield lights from their aircraft through a series of clicks of their radio transmitter. PCL also provides for more efficient use of energy. This system should be

maintained through the planning period.

Airfield Signs

Airfield identification signs assist pilots in identifying their location on the airfield and directing them to their desired location. Lighted signs are installed on all runway and taxiway intersections. All of these signs should be maintained throughout the planning period.

Pavement Markings

Runway markings are designed according to the type of instrument approach available on the runway. FAA AC 150/5340-1F, *Marking of Paved Areas on Airports*, provides guidance necessary to design airport markings. Runway 8-26 has non-precision markings. Runway 26 markings will need to be replaced with precision markings if a CAT I approach is implemented. The existing markings on Runway 8 should be properly maintained through the planning period. The proposed parallel runway could be served by basic markings.

The current hold positions associated with primary Runway 8-26 are marked 250 feet from the runway centerline. This meets the standard for ARC D-II and D-III aircraft and should be maintained throughout the planning period. The hold positions associated with the proposed parallel runway should also be planned at 250 feet to meet FAA standard.

Helipads

Camarillo Airport does have two designated helicopter operating areas. The itinerant space is located northwest of the ATCT, just north of Taxiway F. A helicopter training pad is provided on the north side of the airfield north of Taxiway B. Both of these facilities should be maintained in the future.

NAVIGATIONAL AIDS AND INSTRUMENT APPROACH PROCEDURES

Airport and runway navigational aids are based on FAA recommendations, as defined in DOT/FAA Handbook 7031.2B, *Airway Planning Standard Number One*, and FAA AC 150/5300-2D, *Airport Design Standards, Site Requirements for Terminal Navigation Facilities*.

Navigational Aids

Navigational aids are electronic devices that transmit radio frequencies which properly equipped aircraft and pilots translate into point-to-point guidance and position information. The very high frequency omnidirectional range (VOR), global positioning system (GPS), nondirectional beacon (NDB), and LORAN-C are available for pilots to navigate to and from Camarillo Airport. These systems are sufficient for navigation to and from the airport; therefore, no other navigational aids are needed at the airport.

Instrument Approach Procedures

Instrument approach procedures (IAPs) are a series of predetermined maneuvers established by the FAA using electronic navigational aids that assist pilots in locating and landing at an airport during low visibility and cloud ceiling conditions. At Camarillo Airport, Runway 26 is served by two GPS approaches and one VOR approach. Runway 8 is served by a GPS approach.

The two GPS approaches serving Runway 26 provide the best approach minimums. Moreover, the GPS Z approach to Runway 26 provides vertical guidance in addition to lateral guidance. This approach allows aircraft to land at the airport when visibility is not lower than three-quarters of a mile and cloud ceilings are as low as 250 feet above ground level (AGL) for all aircraft categories.

A GPS modernization effort is underway by the FAA and focuses on augmenting the GPS signal to satisfy requirements for accuracy, coverage, availability, and integrity. For civil aviation use, this includes the continued development of the Wide Area Augmentation System (WAAS), which was initially launched in 2003. The WAAS uses a system of reference stations to correct signals from the GPS satellites for improved navigation and approach capabilities. Where the non-WAAS GPS signal provides for enroute navigation and limited instrument approach (lateral navigation) capabilities, WAAS provides for approaches with both course and vertical navigation. This capability was historically only provided by an instrument landing system (ILS), which requires extensive on-airport facilities. After 2015, the WAAS upgrades are expected to allow for the development of approaches to most airports with cloud ceilings as low as 200 feet above the ground and visibilities restricted to one-half mile.

Weather conditions at Camarillo Airport can at times be below existing approach minimums. As a result, the airport is effectively closed for aircraft landings during these conditions. The GPS-WAAS would allow for full CAT I minimums; however, this will require the installation of an approach lighting system such as the MALSR. Runway 26 will be planned for a CAT I GPS approach, while Runway 8 will be planned for an approach similar to the GPS Z approach currently serving Runway 26. The proposed parallel runway will be planned for visual approaches.

Weather Reporting Aids

Camarillo Airport has a lighted wind cone and segmented circle as well as two supplemental wind cones. The lighted wind cones provide information to pilots regarding wind conditions, such as direction and speed. The segmented circle consists of a system of visual indicators designed to provide traffic pattern information to pilots. A wind cone and segmented circle are required since the ATCT is not open 24 hours per day. These should be maintained throughout the planning period.

Two types of automated weather observing systems are currently deployed at airports around the country. Automated Surface Observing System (ASOS) and Automated Weather Observing System (AWOS) both measure and process surface weather observations 24 hours per day, with reporting varying from one minute to hourly. These systems provide near real-time measurements of atmospheric conditions.

ASOS systems are typically commissioned by the National Weather Service. AWOS systems are often commissioned by the Federal Aviation Administration for airports that meet criteria of either 8,250 annual itinerant operations or 75,500 local operations. Camarillo Airport is currently served by an ASOS which should be maintained in the future.

Air Traffic Control

As previously mentioned, Camarillo Airport has an operational airport traffic control tower that is attended from 7:00 a.m. through 9:00 p.m. local time daily. The control tower is owned and operated by the FAA and provides several control services, including approach and departure clearances, automated terminal information services (ATIS), and ground control. The ATCT should be maintained throughout the planning period.

LANDSIDE REQUIREMENTS

Landside facilities are those necessary for the handling of aircraft and passengers while on the ground. These facilities provide the essential interface between the air and ground transportation modes. The capacity of the various components of each area was examined in relation to projected demand to identify future landside facility needs. This includes components for general aviation needs such as:

- Aircraft Hangars
- Aircraft Parking Aprons
- General Aviation Terminal
- Auto Parking and Access
- Airport Support Facilities

HANGARS

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

Hangar facilities at Camarillo Airport consist of conventional hangars, executive hangars, and T-hangars including Port-A-Port hangars. These different types of hangars offer varying levels of privacy, security, and size. Demand for hangars also varies with the number of aircraft based at the airport. Another important factor is the type of based aircraft. Smaller single engine aircraft usually prefer T-hangars or executive hangars, while larger multi-engine aircraft and business jets will prefer conventional or

executive hangars. Rental costs will also be a factor in the choice.

While a majority of aircraft owners prefer enclosed aircraft storage, a number of based aircraft will still tie-down outside (due to the lack of hangar availability, hangar rental rates, and/or operational needs). Therefore, enclosed hangar facilities do not necessarily need to be planned for each based aircraft. At Camarillo Airport, the majority of based aircraft are currently stored in hangars (85 percent). Future storage percentages will remain relatively similar.

Airport staff maintains a waiting list of aircraft owners desiring to store their aircraft in a County-owned hangar. This list is comprised of approximately 200 aircraft. It is assumed that several aircraft that are currently located in tie-down positions on the airport would move into a hangar facility as they become available. Conversion of the waiting list to signed hangar leases was taken into consideration when developing hangar storage requirements.

Presently, all of the T-hangar positions on the airfield are occupied and there is a waiting list for units. The airport has 180 T-hangar and Port-A-Port storage units. T-hangar and Port-A-Port hangar space available at the airport totals approximately 184,000 square feet for aircraft storage. Analysis of future T-hangar and shade hangar requirements, as depicted on **Table 3J**, indicates additional T-hangar and/or Port-A-Port hangar positions which will be needed through the long range planning horizon.

Executive hangar space makes up a substantial portion of hangar space at the airport. These hangars are typically utilized by owners of larger aircraft or multiple aircraft. Often a corporate flight department will operate out of an executive hangar as well. Executive hangar space at Camarillo Airport currently totals approximately 190,000 square feet. Future requirements show a large demand for executive hangar space.

Conventional hangars are typically 10,000 square feet or larger and utilized for bulk aircraft storage and by airport businesses such as fixed base operators (FBOs), maintenance providers, and flight schools. At Camarillo Airport, conventional hangars provide approximately 280,000 square feet of aircraft storage and maintenance space.

Table 3J compares existing hangar space to the future hangar requirements. It is evident from the table there is a need for additional hangar space throughout the planning period. The analysis also indicates a potential need for additional maintenance and office area space through the planning period. It is expected that the aircraft storage hangar requirements will continue to be met through a combination of hangar types.

TABLE 3J
Aircraft Storage Hangar Requirements
Camarillo Airport

		Future Requirements		
	Currently Available	**Short Term**	**Intermediate Term**	**Long Term**
Total Based	533	570	630	750
Aircraft To Be Hangared	453	469	521	625
T-Hangar/Port-A-Port Positions	180	205	225	267
Executive Hangar Positions	189	218	241	287
Conventional Hangar Positions	84	46	55	71
T-Hangar/Shade Hangar Area	183,600	219,600	269,700	320,000
Executive Hangar Area	189,400	300,600	361,700	431,200
Conventional Hangar Area	224,600	139,300	164,000	211,800
Maintenance/Office Area	56,200	85,500	94,500	112,500
Total Hangar Area (s.f.)	**653,800**	**745,000**	**889,900**	**1,075,500**

Source: Coffman Associates analysis

AIRCRAFT PARKING APRON

FAA Advisory Circular 150/5300-13, *Airport Design*, Change 13, suggests a methodology by which transient apron requirements can be determined from knowledge of busy-day operations. At Camarillo Airport, the number of itinerant spaces required was determined to be approximately 15 percent of the busy-day itinerant operations. A planning criterion of 800 square yards per aircraft was applied to determine future transient apron requirements for single and multi-engine aircraft. For business jets (which can be much larger), a planning criterion of 1,600 square yards per aircraft position was used. Locally based tie-downs typically will be utilized by smaller single engine aircraft; thus, a planning standard of 650 square yards per position is utilized.

A parking apron should provide space for the number of locally based aircraft that are not stored in hangars, transient aircraft, and for maintenance activity. For local tie-down needs, an additional 20 spaces are identified for maintenance activity. Maintenance activity would include the movement of aircraft into and out of hangar facilities and temporary storage of aircraft on the ramp.

Total apron parking requirements are presented in **Table 3K**. Currently, there are 222 positions available for single and multi-engine aircraft on the airport. As shown in the table, there will be a need for additional apron over the planning period. While the total number of parking spaces is adequate, the analysis indicates a need for additional space to accommodate additional operational movement in all apron areas.

TABLE 3K
Aircraft Parking Apron Requirements
Camarillo Airport

	Currently Available	Short Term	Intermediate Term	Long Term
Single, Multi-Engine Transient Aircraft Positions		39	42	48
Apron Area (s.y.)		31,200	33,600	38,400
Transient Business Jet Positions		10	11	13
Apron Area (s.y.)		16,000	17,600	20,800
Locally Based Aircraft Positions		121	129	145
Apron Area (s.y.)		78,700	83,900	94,300
Total Positions	**222**	**170**	**182**	**206**
Total Apron Area (s.y.)	**99,500**	**125,900**	**135,100**	**153,500**

GENERAL AVIATION TERMINAL FACILITIES

General aviation terminal facilities have several functions. Space is required for a pilots' lounge, flight planning, concessions, management, storage, and various other needs. This space is not necessarily limited to a single, separate terminal building, but can include space offered by FBOs for these functions and services.

The methodology used in estimating general aviation terminal building space needs is based on the number of itinerant users expected to utilize general aviation facilities during the design hour. General aviation space requirements were then based upon providing 120 square feet per design hour itinerant passenger. Design hour itinerant passengers are determined by multiplying design hour itinerant operations by the number of passengers on the aircraft (multiplier). An increasing passenger count per aircraft (from 1.8 to 2.2) is used to account for the likely increase in the number of passengers utilizing general aviation services. **Table 3L** outlines the general aviation terminal facility space requirements for Camarillo Airport.

An additional consideration for terminal space is the emergence of a new class of aircraft. As mentioned in a previous chapter, a number of aircraft manufacturers are beginning to produce low cost microjets, commonly referred to as very light jets (VLJs). The VLJs typically have a capacity of up to six passengers. A number of new companies are positioning themselves to utilize the VLJs for on-demand air taxi services. The air taxi businesses are banking on a desire by business travelers to avoid delays at major commercial service airports by taking advantage of the nationwide network of general aviation airports such as Camarillo Airport. General aviation airports with appropriate terminal building services are better positioned to meet the needs of this new class of business traveler.

TABLE 3L
General Aviation Terminal Area Facilities
Camarillo Airport

	Currently Available	Short Term	Intermediate Term	Long Term
Design Hour Operations	71	83	90	107
Design Hour Itinerant Operations	37	50	53	61
Multiplier	1.8	1.9	2.0	2.2
Total Design Hour Itinerant Passengers	66	95	106	134
General Aviation Building Spaces (s.f.)*	Approx. 40,000	11,400	12,700	16,100

*Includes space provided by FBO and other aviation businesses.

AUTOMOBILE PARKING

General aviation vehicular parking demands have been determined for Camarillo Airport. Space determinations were based on an evaluation of the existing airport use, as well as industry standards. Terminal automobile parking spaces required to meet general aviation itinerant demands were calculated by taking the design hour itinerant passengers and using a multiplier of 1.9, 2.0, and 2.2 for each planning period. This multiplier represents the anticipated gradual increase in the number of passengers per aircraft utilizing general aviation services.

The parking requirements of based aircraft owners should also be considered. Although some owners prefer to park their vehicles in their hangars, safety can be compromised when automobile and aircraft movements are intermixed. For this reason, separate parking requirements, which consider one-half of based aircraft at the airport, were applied to general aviation automobile parking space requirements. Currently, there are approximately 650 parking spaces on the airport providing 221,100 square feet of parking area. Parking requirements for the airport are summarized in **Table 3M**.

SUPPORT REQUIREMENTS

Various facilities that do not logically fall within the classifications of airside or landside facilities have also been identified. These other areas provide certain functions related to the overall operation of the airport.

TABLE 3M
Vehicle Parking Requirements
Camarillo Airport

		Future Requirements		
	Currently Available	**Short Term**	**Intermediate Term**	**Long Term**
Design Hour Itinerant Passengers		95	106	134
Terminal Vehicle Spaces*		170	191	242
Parking Area (s.f.)*		68,100	76,500	96,600
General Aviation Vehicle Spaces		285	315	375
Parking Area (s.f.)		114,000	126,000	150,000
Total Parking Spaces	**650**	**455**	**506**	**617**
Total Parking Area (s.f.)	**221,100**	**182,100**	**202,500**	**246,600**

FUEL STORAGE

Fuel storage requirements are typically based upon maintaining a two-week supply of fuel during an average month. However, more frequent deliveries can reduce the fuel storage capacity requirement. Generally, fuel tanks should be of adequate capacity to accept a full refueling tanker, which is approximately 8,000 gallons, while maintaining a reasonable level of fuel in the storage tank. Maintaining storage to meet a two-week supply for each is currently available.

Ventura County and private airport businesses currently operate 12 above ground fuel storage tanks of varying sizes. These facilities provide a total of 46,000 gallons for 100LL Avgas storage and 128,000 gallons for Jet A fuel storage.

An analysis of the fuel sales for the last five years was conducted to determine the adequacy of the existing fuel storage capacity. Over the last five years, Jet A fuel sales have averaged 1.9 million gallons, while 100LL fuel averaged 560,000 gallons per year. On a monthly basis, the averages are 160,000 gallons and 47,000 gallons, respectively. The current Jet A and 100LL storage capacities provided at the airport exceed the two-week supply criteria. The trend over the last two years, however, has been for increasing Jet A demand, while 100LL demand has remained relatively stable, decreasing slightly. Future demand may require additional Jet A storage, however, this capacity will likely be provided as needed by one of the airport's FBOs.

AIRCRAFT RESCUE AND FIREFIGHTING (ARFF)

Camarillo Airport is currently served by the Ventura County's Fire Station #50 located in the eastern area of the airport adjacent Los Posas Road. Fire Station #50 is designed to provide emergency and rescue services to the airport and the surrounding area. The station has properly equipped personnel and equipment to serve the airport's needs.

It is not necessary that ARFF services be located at the airport, although it serves as an added safety enhancement with personnel and equipment located on the airport. Only certified airports providing scheduled passenger service with greater than nine passenger seats are required to provide ARFF services. Many corporate flight departments, however, are requesting ARFF services at the airports they utilize. It is recommended that Camarillo Airport be able to continue providing ARFF services in the future as forecasts indicate an increasing amount of business jets utilizing the airport.

PERIMETER FENCING/GATES

The airport is currently surrounded by six-foot tall chain link security fencing. The fencing is supported with automated, key-code gates at sporadic locations in the terminal area.

AIRPORT MAINTENANCE BUILDING

The airport maintenance building is the eastern portion of the terminal area. This facility provides approximately 4,280 square feet of building/shop space and an additional 7,500 square feet of yard space for the storage of airport maintenance equipment. This facility should be maintained through the long term planning period.

SURFACE TRANSPORTATION ACCESS

Primary access to the airport is via Pleasant Valley Road. On-airport access is provided by several arterial roads which provide access to the many airport facilities. The existing roadway structure is adequate to serve the needs of airport users through the planning period.

SUMMARY

The intent of this chapter has been to outline the facilities required to meet potential aviation demands projected for Camarillo Airport for the planning horizon. A summary of the airside and landside requirements is presented on **Exhibits 3E** and **3F**.

Following the facility requirements determination, the next step is to determine a direction of development which best meets these projected needs through a series of Airport Development Alternatives. The remainder of the Master Plan will be devoted to outlining this direction, its schedule, and its cost./

	AVAILABLE	SHORT TERM	LONG TERM
RUNWAYS			
	**Runway 8-26** 6,013 x 150' 50,000# SWL 80,000# DWL 125,000# DTWL 3/4 Mile Visibility (26) 1 Mile Visibility (8) ARC D-II	**Runway 8-26** Upgrade to ARC D-III	**Runway 8-26** Increase to 100,000# DWL **Proposed Parallel Runway** 3,500' x 75' 30,000# SWL 1 Mile Visual 700' Separation from Runway 8-26 ARC B-II
TAXIWAYS			
	**Runway 8-26** Full Parallel Taxiway 1,000' Separation 5 Exits All Taxiways =< 50' wide Hod Aprons	**Runway 8-26** Same	**Runway 8-26** Consider additional Exits **Proposed Parallel Runway** Full Length Parallel Taxiway 300' Separation from runway 3-4 Exits All taxiways 35' wide
NAVIGATIONAL AIDS			
	ATCT (7:00 a.m. - 9:00 p.m.) GPS VOR (26)	Same	Add: CAT I (26) 3/4 Mile GPS (8)
LIGHTING AND MARKING			
	Airport Beacon Segmented Circle Windcones (3) MITL **Runway 8-26** MIRL/PAPI-2/REIL/PCL Hold Positions - 250' Nonprecision Markings	Same	Add: **Runway 8-26** Precision Marking (26) PAPI-4 MALSR (26) **Proposed Parallel Runway** MIRL/PAPI-2/REIL/PCL Hold Positions - 250' Basic Markings

KEY

ATCT - Airport Traffic Control Tower
DTWL - Dual Tandem Wheel Loading
DWL - Dual Wheel Loading
MIRL - Medium Intensity Runway Lighting
MITL - Medium Intensity Taxiway Lighting
PAPI - Precision Approach Path Indicator
PCL - Pilot Controlled Lighting
REILs - Runway End Identifier Lights
SWL - Single Wheel Loading

CAMARILLO AIRPORT

Exhibit 3E
AIRFIELD REQUIREMENTS

06MP19-3F-07/03/08

AIRCRAFT STORAGE HANGARS

	Available	Short Term	Intermediate Term	Long Term
Aircraft to be Hangared	453	513	567	675
T-Hangar/Port-A-Port Positions	180	205	225	267
Executive Hangar Postions	189	218	241	287
Conventional Hangar Positions	84	46	55	71
T-Hangar/Port-A-Port Hangar Area (s.f.)	183,600	219,600	269	320,000
Box Hangar Area (s.f.)	189,400	300,600	361,700	431,200
Conventional Hangar Area (s.f.)	224,600	139,300	164,000	211,800
Maintenance Area (s.f.)	56,200	85,500	94,500	112,500
Total Hangar Area (s.f.)	653,800	745,000	889,900	1,075,500

AIRCRAFT PARKING APRON

Single, multi-engine aircraft positions	--	39	42	48
Apron area (s.y.)	--	31,200	33,600	38,400
Transient business jet positions	--	10	11	13
Apron area (s.y.)	--	16,000	17,600	20,800
Locally-based aircraft positions	--	121	129	145
Apron area (s.y.)	0	78,700	83,900	94,300
Total Positions	222	170	182	206
Total Apron Area (s.y.)	99,500	125,900	135,100	153,500

GENERAL AVIATION TERMINAL AND VEHICLE PARKING

Terminal Building Space (s.f)	40,000	11,400	12,700	16,100
Vehicle Parking Positions	650	455	506	617
Total Vehicle Parking Area (s.f)	221,100	182,100	202,500	246,600

CHAPTER FOUR

AIRPORT DEVELOPMENT ALTERNATIVES

CHAPTER FOUR

AIRPORT DEVELOPMENT ALTERNATIVES

The previous chapters have focused on the airport's available facilities, existing and potential future demand levels and future types of facilities that are needed to meet demand. Prior to defining the recommended development program for Camarillo Airport, it is important to first consider development potential as well as constraints to future development at the airport. The purpose of this chapter is to formulate and examine reasonable airport development alternatives that address the planning horizon demand levels. Because there are a multitude of possibilities and combinations thereof, intuitive judgment is necessary to focus in on those opportunities which have the greatest potential for success.

Any development proposed by a Master Plan evolves from an analysis of projected needs. Though the needs were determined by the best methodology available, it cannot be assumed that future events will not change these needs. The master planning process attempts to develop a viable concept for meeting the needs caused by projected demands for the next 20 years. However, no plan of action should be developed which may be inconsistent with the future goals and objectives of Ventura County, its citizens, and airport users who have a vested interest in the development and operation of the airport.

In this chapter, airport development alternatives are considered for the

airport, where applicable. The ultimate goal is to develop the underlying rationale which supports the final recommended Master Plan development concept. Through this process, an evaluation of the most realistic and best uses of airport property is made while considering local development goals, physical and environmental constraints, and appropriate federal airport design standards.

The development alternatives for Camarillo Airport can be categorized into two functional areas: airside (runways, taxiways, navigational aids, etc.) and landside (general aviation hangars, aprons, terminal area, etc.). This Master Plan primarily focuses on the aviation-use development of existing and proposed property that will encompass the airport. Within each of these areas, specific facilities are required or desired. In addition, the utilization of the remaining airport property to provide revenue support for the airport and to benefit the economic development and well-being of the regional area must be considered.

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

The alternatives presented in this chapter have been developed to meet the overall program objectives for the airport in a balanced manner. Through coordination with the Planning Advisory Committee (PAC) and airport administration, the alternatives (or combination thereof) will be refined and modified as necessary to develop the recommended development concept. Therefore, the alternatives presented in this chapter can be considered a beginning point in the development of the recommended concept for the future development of Camarillo Airport.

NO-BUILD ALTERNATIVE

In analyzing and comparing the advantages and disadvantages of various development alternatives, it is important to consider the consequences of no future development at Camarillo Airport. The "no-build" or "do nothing" alternative essentially considers keeping the airport in its present condition, not providing any type of expansion or improvement to the existing facilities (other than general airfield and County-owned hangars projects). The primary result of this alternative would be the inability of the airport to satisfy the projected aviation demands of the airport service area.

Camarillo Airport is an important contributor to the economic development of the regional area. The airport is a transportation link to other regional and national economic centers via general aviation activities. Not improving Camarillo Airport to meet general aviation needs could limit economic growth for the region.

The significant levels of activity at Camarillo Airport can largely be attributed to the growing socioeconomic conditions of Ventura County and growth within the general aviation industry as a whole. The general aviation industry has experienced extended periods of decline and growth over the last 20 years. However, general aviation is now seen as a growth industry once more. While overall, general aviation growth will be steady but slow nationally, the demand for higher performance aircraft is experiencing the strongest growth rate. With heightened interest in commercial aviation security, corporate general aviation could expect demand for private aircraft to grow even more. This could be spurred by the new very light jet (VLJ) and expectations for true air taxi service at general aviation airports.

Aviation demand forecasts and analysis of facility requirements indicated a potential need for improved facilities at Camarillo Airport. Improvements recommended in the previous chapter include developing a parallel runway for small aircraft operations, improving the efficiency of the taxiway system, improving instrument approach procedures, providing additional airfield approach aids, constructing additional hangar facilities, and maximizing the use of airport property for revenue producing activities. Without these improvements, regular users of the airport will be constrained from taking maximum advantage of the airport's air transportation capabilities.

The unavoidable consequence of the "no-build" alternative would involve the airport's inability to attract potential airport users and expand economic development in Ventura County and the surrounding region. Corporate aviation and commercial air service play a major role in the transportation of business leaders and key employees. If the airport does not have the capability to meet hangar, apron, or airfield needs of potential users, the County's capability to attract the major sector businesses or recreational travelers that rely on air transportation could be diminished.

Following the "no-build" alternative would also not support the private businesses that have made investments at Camarillo Airport. As these businesses grow, the airport will need to be able to accommodate the infrastructure needs associated with their growth. Each of the businesses on the airport provides jobs for local residents, creates positive economic benefits for the community, and pays taxes for local government operations.

By owning and operating Camarillo Airport, Ventura County is charged with the responsibility to develop aviation facilities necessary to accommodate aviation demand and minimize operational constraints. Flexibility must be programmed into airport development to assure adequate capacity should market conditions change unexpectedly.

To propose no further development at Camarillo Airport could adversely affect the long term viability of the airport, resulting in negative economic effects on Ventura County and the region as a whole. The "no-build" alternative is also inconsistent with the

long term goals of the Federal Aviation Administration (FAA), which are to enhance local and interstate commerce. Therefore, this alternative is not considered to be prudent or feasible and will no longer be considered in this study.

Another consideration would be to shift the current aviation demand at Camarillo Airport to another airport in the region. This alternative was also considered but rejected. Camarillo Airport is the most substantial facility in terms of existing facilities in the region and is also the only airport capable of meeting significant demand increases. No other airport in the region could accommodate Camarillo Airport's existing demand, let alone the projected increased demand. As a result, this option will no longer be considered in the study.

AIRPORT DEVELOPMENT OBJECTIVES

It is the overall objective of this effort to produce a balanced airside and landside complex to serve forecast aviation demands. However, before defining and evaluating specific alternatives, airport development objectives should be considered. The primary goal of the Master Plan is to define a development concept which allows for the airport to be marketed, developed, and safely operated for the betterment of the region and its users. With this in mind, the following development objectives have been defined for this planning effort:

- Maintain an attractive, efficient, and safe aviation facility in accordance with federal, state, and local regulations.

- Develop facilities to efficiently serve general aviation users and encourage increased use of the airport, including increased business and corporate use of the airport.

- Provide sufficient airside and landside capacity through additional facility improvements which will meet the long term planning horizon level of demand of the region.

- Identify any future land acquisition needs.

- Ensure that any recommended future development is environmentally compatible.

- Target local economic development through the development of available property.

- Identify opportunities for approved non-aeronautical use of certain areas on the airport to further diversify the airport's revenue-generating potential.

The remainder of this chapter will describe various development alternatives for the airside and landside facilities. Within each of these areas, specific facilities are required or desired. Although each area is treated separately, planning must integrate the individual requirements so that they complement one another. **Exhibit 4A** presents both airside and landside

AIRSIDE CONSIDERATIONS

- Improvements necessary to meet FAA's ARC C/D-III standards
- Additional exit taxiways or reconfiguration of existing exit taxiways on Runway 8-26 to improve airfield capacity
- Category I approach minimums (1/2 mile visibility and 200-foot cloud ceilings) for Runway 26
- Improved minimums on Runway 8 down to ¾ mile visibility
- Potential property acquisition, either fee simple or avigation easement necessary for improved approach minimums
- Upgrade PAPI-2 units on Runway 8-26 to PAPI-4 units
- Development of a parallel runway designed for small aircraft only (3,500' x 75') served by visual approaches and separated from existing Runway 8-26 by 700 feet
- Development of a midfield parallel taxiway north of the proposed parallel runway to serve existing Runway 8-26

LANDSIDE CONSIDERATIONS

- Maximize land for aviation development
- Layout of future conventional, executive, and T-hangar facilities
- Maximize efficiency of aircraft movements in terminal area
- Increased aircraft parking apron to meet the needs of itinerant and based aircraft
- Increased fuel farm capacity
- Automobile access improvements

CAMARILLO AIRPORT

planning issues that will be specifically addressed.

CURRENTLY APPROVED ALP

The currently approved airport layout plan (ALP) is depicted on **Exhibit 4B** which illustrates the currently accepted plan for existing and future airport facilities. As depicted on the exhibit, Runway 8-26 remains in its current layout. The plan does consider the development of a small parallel runway (3,500 feet long by 75 feet wide) 700 feet to the south of Runway 8-26 (centerline to centerline). This separation is the minimum allowable under FAA standards and would not allow for simultaneous instrument flight rule (IFR) operations. It will, however, allow for both runways to be utilized during visual flight rule (VFR) conditions. As a result, the dual runway system would be capable of increasing airfield capacity by moving small aircraft and training operations to the inboard while allowing the existing runway to serve larger aircraft with less delay.

The plan also considers developing a new full length parallel taxiway 400 feet south of the existing runway. The new parallel taxiway would be necessary to improve taxiing efficiency, to resolve east-and-west taxiing conflicts on Taxiway F, and to serve existing Runway 8-26 once the parallel runway became operational. Landside development presented on **Exhibit 4B** considers new hangar construction in the eastern and south central portions of the terminal area.

AIRSIDE PLANNING CONSIDERATIONS

Airfield elements such as the runway and taxiway system are, by nature, the focal point of the airport complex. Because of their primary role and the fact that they physically dominate airport land use, airfield facility needs are often the most critical factor in the determination of viable airport development alternatives. In particular, the runway system requires the greatest commitment of land area and often imparts the greatest influence on the identification and development of other airport facilities. Furthermore, aircraft operations dictate the FAA design criteria that must be considered when examining potential airfield improvements. These design standards can have a significant impact on the various alternatives intended to meet airfield needs.

Several airfield topics will be discussed in detail and then applied to the various airport development alternatives. In the next chapter, a recommended alternative will be presented which may be one of these alternatives as presented or may be a combination of elements from these alternatives.

AIRFIELD DESIGN STANDARDS

The design of airfield facilities is based, in part, on the physical and operational characteristics of aircraft using the airport. The FAA utilizes the Airport Reference Code (ARC) system to relate airport design requirements

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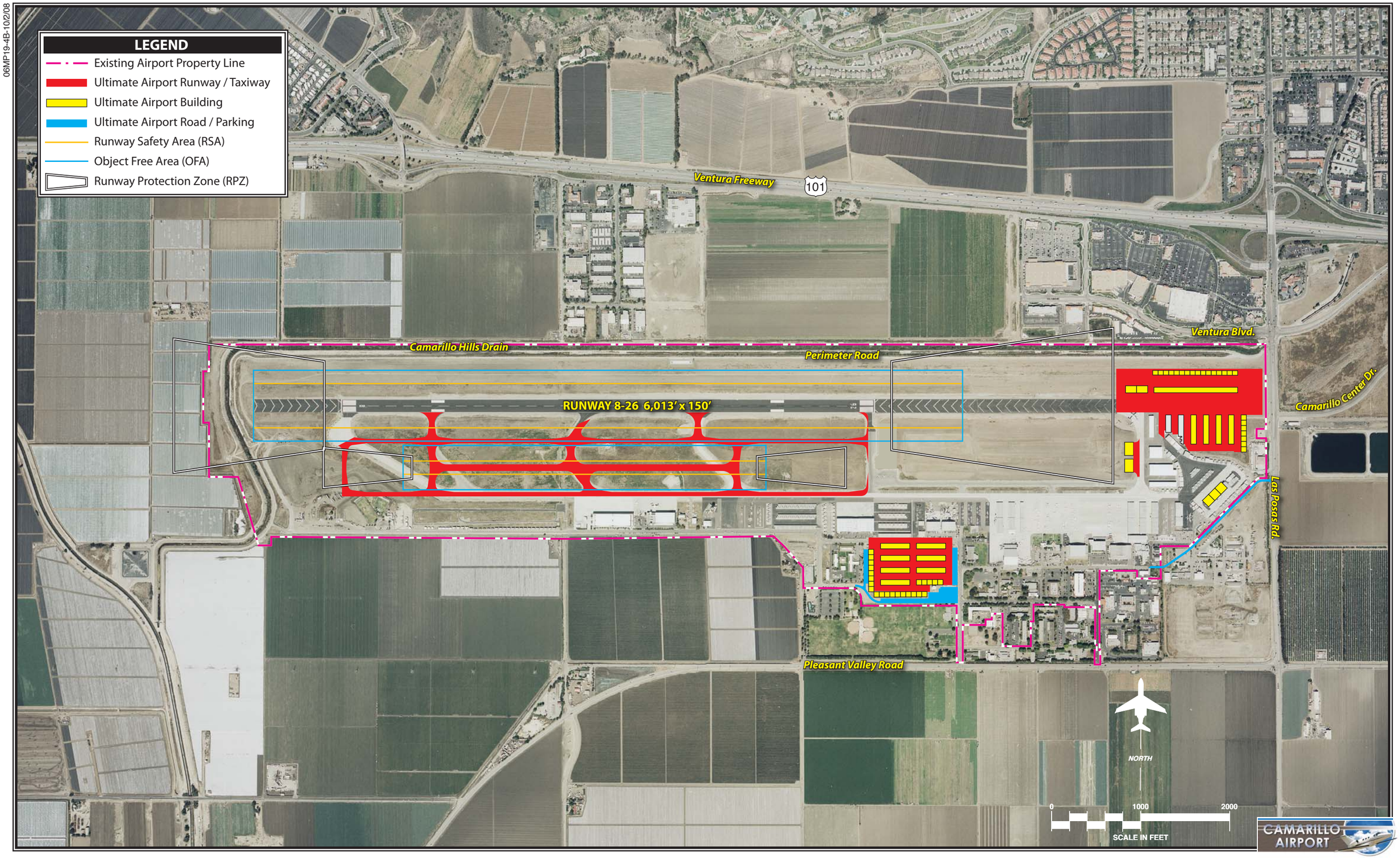

Exhibit 4B
CURRENT ALP CONCEPT

to the physical (wingspan and tail height) and operational (approach speed) characteristics of the largest and fastest aircraft conducting 500 or more operations annually at the airport. While this can at times be represented by one specific make and model of aircraft, most often the airport's ARC is represented by several different aircraft which collectively conduct more than 500 annual operations at the airport.

Analysis in the previous chapter indicated that the critical aircraft at Camarillo Airport is currently ARC C/D-II. It is forecast, however, that during the course of the short term planning period, the critical aircraft will transition to ARC C/D-III. With this transition come some changes in FAA design standards. Most planning standards do not change with the transition, however, some are increased. Of primary concern are those areas supporting Airplane Design Group III for taxiing operations. These changes will be outlined in the following sections. The proposed parallel runway will be developed according to small aircraft standards for ARC A/B-II.

Runway Safety Area

The FAA defines the runway safety area (RSA) as "a defined surface surrounding the runway prepared or suitable for reducing the risk of damage to airplanes in the event of an undershoot, overshoot, or excursion from the runway." The RSA is an integral part of the runway environment. RSA dimensions are established in FAA Advisory Circular (AC) 150/5300-13, Change 13, *Airport Design*, and are based on the ARC of the critical design aircraft for the airport. The RSA is intended to provide a measure of safety in the event of an aircraft's excursion from the runway, by significantly reducing the extent of personal injury and aircraft damage during overruns, undershoots, and veer-offs. According to the AC, the RSA must be:

1) cleared and graded and have no potentially hazardous ruts, bumps, depressions, or other surface variations;

2) drained by grading or storm sewers to prevent water accumulation;

3) capable, under dry conditions, of supporting aircraft rescue and firefighting equipment, and the occasional passage of aircraft without causing structural damage to the aircraft; and

4) free of objects, except for objects that need to be located in the safety area because of their function.

Furthermore, the FAA has placed a higher significance on maintaining adequate RSAs at all airports due to recent aircraft accidents. Under Order 5200.8, the FAA established the *Runway Safety Area Program*. The Order states, "The goal of the Runway Safety Area Program is that all RSAs at federally-obligated airports and all RSAs at airports certificated under Title 14 of the Code of Federal Regulations (CFR) Part 139 shall conform to the standards contained in AC

150/5300-13, *Airport Design*, to the extent practicable." Under the Order, each Regional Airports Division of the FAA is obligated to collect and maintain data on the RSA for each runway at federally-obligated airports.

In late 2004, a notable change to AC 150/5300-13, *Airport Design*, pertained to RSAs. Previously, the FAA required the same RSA on both ends of the runway, based on ARC of the critical aircraft. The new change recognizes different RSA measurements for take-offs and landings. For ARC C/D-II aircraft, 600 feet of RSA is now required prior to the approach end of the runway, whereas 1,000 feet is still required beyond the far end of the runway. The intent of this change is to allow airports with significant physical constraints, such as a creek or highway off the runway end, to avoid shortening the runway. Even with the new standard, all airports should strive for the full RSA on both runway ends.

As previously mentioned, the airport's current critical aircraft falls in ARC C/D-II. With approach visibility minimums currently not lower than three-quarters of a mile, the required RSA for Runway 8-26 is 500 feet wide, extending 1,000 feet beyond each runway end. An upgrade to ARC C/D-III design will not change the RSA standard. The existing RSA for Runway 8-26 is adequate to meet existing and future FAA standards.

The proposed parallel runway should be designed to accommodate the full ARC A/B-II RSA standard with visual only approach minimums. As such, the RSA should be developed at 150 feet wide extending 300 feet beyond the runway ends.

Object Free Area

The runway object free area (OFA) is defined in FAA AC 150/5300-13, Change 13, *Airport Design*, as an area centered on the runway extending laterally and beyond each runway end, in accordance to the critical aircraft design category utilizing the runway. The OFA must provide clearance of all ground-based objects protruding above the RSA edge elevation, unless the object is fixed by function serving air or ground navigation.

For ARC C/D-II aircraft design, the OFA should be 800 feet wide and extend 1,000 feet beyond the runway ends. It should be noted that, in some cases, the terrain encompassing the OFA may fall significantly below the RSA elevation. In those cases, objects can be in the OFA as long as they do not rise above the elevation of the RSA at any given lateral position. As with the RSA, the OFA dimensions do not change for an upgrade to ARC C/D-III. Existing and future OFA for the runway fall within current airport bounds and are adequate to meet ARC design standards that apply.

For ARC B-II design and visual approaches on the proposed parallel runway, the OFA is 500 feet wide, extending 300 feet beyond each runway end. The proposed parallel runway should be planned to meet this design standard.

INSTRUMENT APPROACHES

This section will present information regarding the potential for improved instrument approach procedures. Where possible, approach minimums should be as low as possible considering safety and financial constraints. The best approach minimums possible will prevent aircraft from having to divert to another airport, which can cause financial hardship for the operator, on-airport businesses, and the County.

A key priority which needs to be considered is protecting the airport from the potential for flight obstructions. The FAA has established criteria aimed at protecting the airport from these flight obstructions. First, FAA criterion stipulates that obstructions not be placed too near the runway ends or parallel to the runway. The obstruction clearance requirements are based on the ARC and/or the weight of the critical aircraft, as well as the type of approaches established or planned for the airport. For visual approaches and/or approaches not lower than one mile visibility for ARC B-II aircraft, minimum obstruction clearance is required. For ARC C/D-II aircraft with approach minimums lower than three-quarters of a mile visibility, however, the obstruction criterion is more protective.

The two primary resources for determining airspace obstructions are the FAA's Federal Aviation Regulation (F.A.R.) Part 77, *Objects Affecting Navigable Airspace* and *Terminal Instrument Procedures* (TERPS). Part 77 is more of a filter which identifies potential obstructions, whereas TERPS is the critical tool in determining actual flight obstructions. In fact, TERPS analysis is used to evaluate and develop instrument approach procedures including visibility minimums and cloud heights associated with approved approaches.

Analysis in the previous chapter indicated that the plan should consider improved instrument approach capabilities for Runway 8-26. The first step in identifying potential airspace obstructions is the evaluation of the appropriate threshold siting surfaces (TSS). TSS is an imaginary surface which represents the most critical approach area nearest the runway end. The TSS is defined by the visibility minimums of the approach and aircraft type utilizing the approach. At Camarillo Airport, the lowest visibility minimum for aircraft in approach category D is three-quarters of a mile on Runway 26. Runway 8 provides not lower than one mile visibility minimums for approach categories A and B which increases to 1.5 and 1.75 miles for approach categories C and D respectively.

Camarillo Airport should consider approval and implementation of approaches providing for lower than three-quarters of a mile visibility minimums for Runway 26 and three-quarters of a mile for Runway 8. Lower approach minimums will allow operations at the airport, when in the past, aircraft may have had to divert to another airport for landing, or delay departure from their origination point awaiting weather improvements at Ventura County. Moreover, the pro-

jected increase in business jet operations at the airport signify a need for improved instrument approach procedures.

Many reliever general aviation airports have approved instrument approach procedures with visibility minimums as low as one-half mile with a 200-foot cloud height ceiling. This is referred to as a Category (CAT) I approach. CAT I approaches require an approach lighting system, a glideslope antenna, and a localizer. In addition, certain criteria must be met, such as reaching a minimum threshold of annual instrument approaches or regular weather conditions that warrant an instrument landing system (ILS) approach.

As previously discussed in Chapter Three – Airport Facility Requirements, significant advancements continue to be made in global positioning system (GPS) navigation that can provide a more cost-effective and attractive means of obtaining CAT I instrument approaches. This includes the continued development of the Wide Area Augmentation System (WAAS). WAAS provides for approaches with both course and vertical navigation. This capability was historically only provided by an ILS, which requires extensive on-airport facilities. The GPS-WAAS could allow for approach minimums to be lower than three-quarters of a mile visibility. For purposes of this study, the airside alternatives will consider approaches providing for lower than and not lower than three-quarters of a mile visibility minimums.

To achieve an approach providing less than one mile visibility minimums, the corresponding runway end generally requires the installation of an approach lighting system. Examples of approach lighting systems for approaches with not lower than three-quarters of a mile visibility minimums would include a medium intensity approach lighting system (MALS), omnidirectional approach lighting system (ODALS), or a lead-in light system (LDIN). For CAT I approaches, a medium intensity approach lighting system with runway alignment indicator lights (MALSR) is required.

Runway Protection Zone

The RPZ is a trapezoidal surface which begins 200 feet from the runway threshold. The RPZ is a designated area beyond the runway end that the FAA encourages airports to own or, in some fashion, maintain positive control over the types of land uses within the RPZ. The goal of the RPZ standard is to increase safety for both pilots and people on the ground. Unlike the RSA, the RPZ can have objects located within its boundaries, provided the objects are not obstructions under CFR Part 77, *Objects Affecting Navigable Airspace* or FAA Order 8260.3B, *Terminal Instrument Procedures* (TERPS). It should be noted, however, that the FAA places high priority on maintaining the RPZ free of items that attract groupings of people or permanent residences.

The FAA does not necessarily require the fee simple acquisition of the RPZ area, but highly recommends that the

airport have positive control over development within the RPZ. It is preferred that the airport owns the property; however, avigation easements (ownership of airspace within the RPZ) can be pursued if fee simple purchase is not possible. It should be noted, however, that avigation easements can often cost as much as 80 percent of the full property value and may not adequately prohibit incompatible land uses from locating in the RPZ. An avigation easement would include the space below the approach surface and within the RPZ. For planning purposes, where feasible, alternatives will assume fee simple acquisition of the RPZ and land on either end of the runway not currently encompassed by the existing property line.

Runway 26 is currently served by instrument approaches with the lowest available visibility minimums at three-quarters of a mile. The associated RPZ for this approach has an inner width of 1,000 feet, outer width of 1,510 feet, and an overall length of 1,700 feet. Analysis in the previous chapter indicated that Runway 26 should be planned to accommodate a CAT I instrument approach procedure which would allow for visibility minimums of not lower than one-half mile. The associated RPZ for a CAT I approach increases to have an inner width of 1,000 feet, an outer width of 1,750 feet, and an overall length of 2,500 feet.

Runway 8 is supported by an approach with not lower than one mile visibility. The associated RPZ has an inner width of 500 feet, an outer width of 1,010 feet, and an overall length of 1,700 feet. For a Runway 8 planned instrument approach providing for not lower than three-quarter of a mile visibility minimums, the associated RPZ increases in size to a 1,000-foot inner width, 1,510-foot outer width, and an overall length of 1,700 feet.

The RPZ for Runway 26 and most of the RPZ for Runway 8 fall on existing airport property as depicted on **Exhibit 4C**. A portion of both proposed RPZs extend beyond the fee simple property line. It should be noted, however, that the RPZs will remain in areas where the County maintains an avigation easement. As a result, fee simple acquisition of these areas may not be required by the FAA.

The proposed parallel runway should only be offered visual approaches due to its use as a small aircraft and training operations runway. As such, the RPZs have an inner width of 250 feet, outer width of 450 feet, and an overall length of 1,000 feet. The physical layout of these RPZs will be discussed in the specific alternatives presented later in the chapter.

RUNWAY

Analysis in the previous chapter indicated that Runway 8-26 provides adequate length and width to satisfy the planning category of aircraft through the planning period. Currently, Runway 8-26 is 6,013 feet long by 150 feet wide, which meets the requirements of ARC C/D-III aircraft This runway length is consistent with the FAA runway length requirements contained in FAA AC 150/5325-4B, *Run-*

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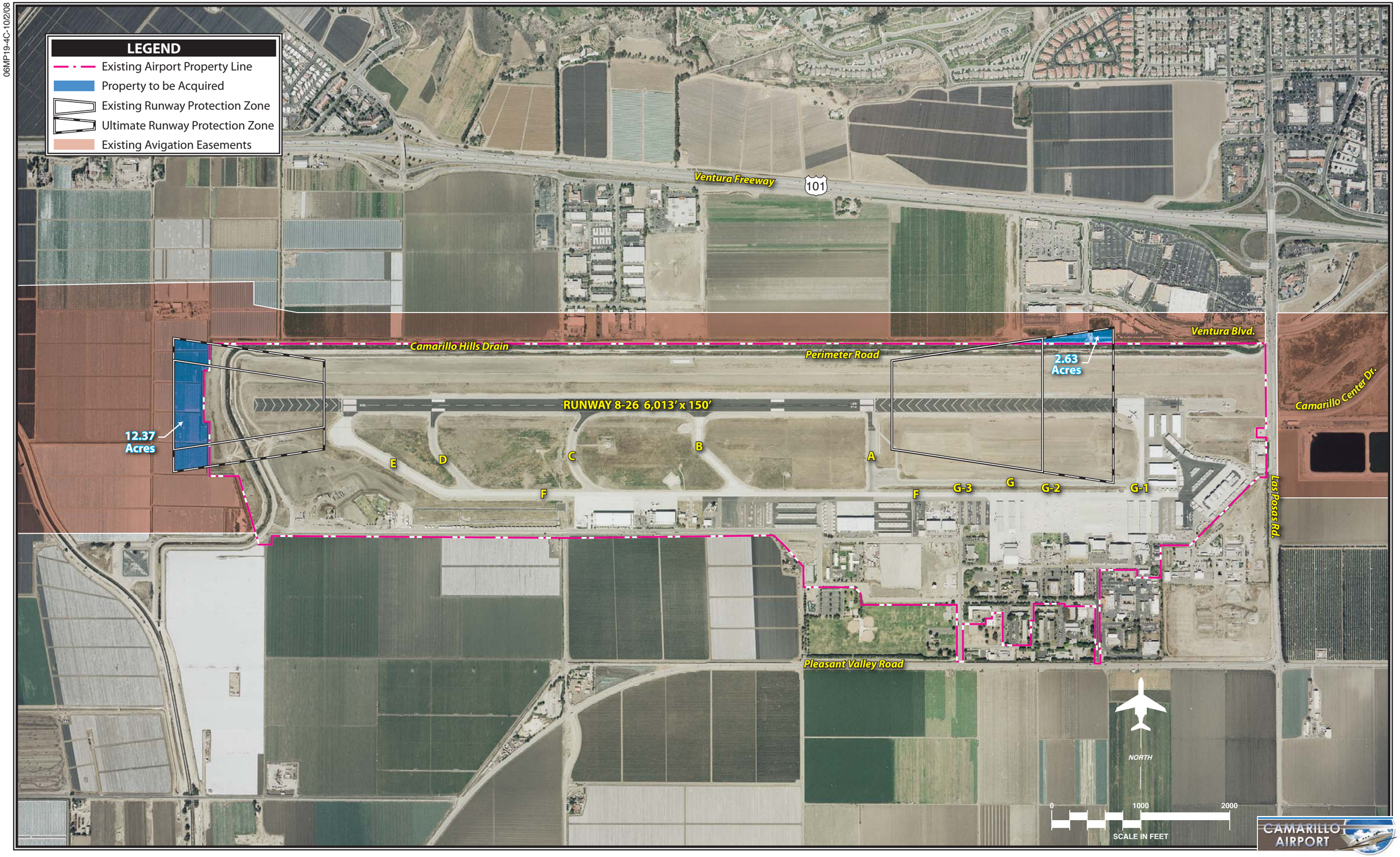

Exhibit 4C
PROPOSED RPZ CHANGES

way Length Requirements for Airport Design.

Also discussed in Chapter Three – Airport Facility Requirements was separation distances between aircraft on the runway and various areas on the airport. The separation distances are a function of the approaches approved for the airport and the runway's designated ARC. Under current conditions (ARC C/D-II, approaches not lower than three-quarters of a mile) parallel taxiways need to be at least 300 feet from the Runway 8-26 centerline. Aircraft parking areas are required to be at least 400 feet from the runway centerline.

In order to meet ARC C/D-III standards with CAT I approaches, parallel taxiways need to be at least 400 feet from the runway centerline, and aircraft parking areas are required to be at least 500 feet from the runway centerline.

Currently, parallel Taxiway F is located 1,000 feet south of Runway 8-26 (centerline to centerline). This location far exceeds FAA standard. All parking aprons exceed the minimum location from the existing runway for the existing and future conditions.

Analysis in the previous chapter indicated the need to increase airfield capacity to meet the projected long term demand level. While some capacity could be gained with taxiway enhancements, the ultimate plan should consider a more significant solution. As such, the analysis indicated a need to plan for the development of a parallel runway. The proposed parallel runway would be designed for small aircraft and training operations only. Furthermore, the runway would not be planned for instrument approach procedures. The recommended length of the runway is 3,500 feet. The runway is required to be at least 700 feet from the existing runway. Alternative runway layouts will be presented later in the chapter.

TAXIWAYS

Taxiways are the primary transport surfaces linked with the runway and its operation. Such surfaces include a parallel taxiway, entrance/exit taxiways, and connecting taxiways. The current layout of the taxiway system at Camarillo Airport is adequate from a functional standpoint. Runway 8-26 is supported by a full length parallel taxiway and five entrance/exit taxiways.

FAA design criteria call for taxiways serving critical aircraft in airplane design group (ADG) II to be at least 35 feet wide. For ADG III aircraft, FAA standards call for a 50-foot wide taxiway surface. All existing taxiways at the airport meet existing and future width standards.

Taxilanes are those surfaces that would typically realize a lower level of aircraft activity because the taxilanes provide direct ingress/egress to a specific location or airport facility. An example of a taxilane would be the surface which links to a box hangar complex, as not all aircraft will use the surface but only those traversing to and from the box hangar.

FAA AC 150/5300-13, Change 13, *Airport Design*, provides standards for taxiway object free areas (OFAs) surrounding the taxiway system. As discussed in the previous chapter, the taxiway OFA is based on the critical aircraft design group which will frequent that particular taxiway. Design standards for ADG II (aircraft with wingspans ranging from 49 feet to 79 feet), require the taxiway OFA to be 131 feet wide. The taxilane OFA required for ADG II aircraft is 115 feet wide. For ADG III aircraft, the taxiway and taxilane OFAs increase to 186 feet and 162 feet, respectively.

The alternatives section to follow will address the development of a new parallel taxiway planned to serve the runway. This taxiway would be necessary for two reasons. First, an upgrade to ARC C/D-III will require a larger taxiway object free area, increasing from 131 feet to 186 feet. The wider taxiway OFA could result in the loss of aircraft apron and the automobile drive lane in the western terminal area. A parallel taxiway would allow for larger Group III aircraft to be routed outside of the western terminal area. Second, the development of a parallel runway would spur the need for a new parallel taxiway for the existing runway. Without a parallel taxiway, full utility of the airfield system would not be achieved, thus, minimizing the capacity enhancement. Aircraft departing or arriving on the existing runway would be required to hold short and then be cleared to cross the proposed parallel runway. A new parallel taxiway located 400 feet south of the existing runway would allow air traffic controllers to route aircraft outside of the proposed parallel runway operating environment.

Additional taxiways should be constructed as development and demand warrant. The alternatives to follow show additional taxiway development. These taxiways are based on continued development of the airport. During the course of the planning period, medium intensity taxiway lighting (MITL) should be applied to all taxiways.

ULTRALIGHT AIRPARK

Camarillo Airport is unique as it provides a segregated area separately developed and designated for ultralight aircraft operations. The ultralight airpark facility is equipped with a runway, taxiway, and hangar facilities. Based on discussions with airport administration and air traffic control (ATC), the operations associated with the ultralight airpark have not conflicted with larger fixed wing traffic utilizing Runway 8-26. It is possible that future increases in aviation demand at Camarillo Airport could result in a need to re-evaluate the airpark's operation.

The development of a parallel runway would require ATC to route traffic on the parallel runway, or inboard runway, to turn south over the airpark while in west traffic flow. West flow is the predominant condition for the airport. As a result, traffic conflicts could be a larger factor than currently exists. At a minimum, delays could be expected for both the ultralight airpark and inboard runway users as

conflicting traffic is directed by ATC. While the development of a parallel runway is considered a long term need, actual demand will dictate its development.

The ultralight airpark currently serves a valuable function for the County and region as a whole. Under current conditions, the ultralight airpark can remain fully functional as long as its operation does not negatively affect the operation of Camarillo Airport. Ultimate plans will consider the ultralight airpark as a continuing member of the airport facility as a whole. It should be noted, however, that further study of the airpark and its operation should be conducted to discern if it can safely and effectively operate with a parallel runway system. This study should be conducted prior to the opening of a parallel runway and should include the input of County officials, airport administration, ATC, and tenants.

AIRSIDE DEVELOPMENT ALTERNATIVES

As previously noted, long term operations will warrant the development of a capacity improvement. The most significant improvement to airfield capacity is the addition of a parallel runway. As with previous planning efforts, however, the proposed parallel runway is being put forth for use of small aircraft and training operations only. In this capacity, the proposed parallel runway could accommodate small and/or repetitive training traffic, thus, allowing the existing runway to more efficiently serve larger aircraft with minimal delay. Existing Runway 8-26 is not being planned to change and will remain in its current length.

The proposed parallel runway will not be required until long term operations are reached. However, the airfield will likely need to be designed to accommodate ARC C/D-III aircraft within the next few years. Operational data indicates that the airport currently has ADG III aircraft utilizing the airport, however, these operations are just below than FAA's critical aircraft threshold of 500 annually. The primary concern with upgrading to meet ARC C/D-III standards is the need to increase the taxiway OFA from 131 feet to 186 feet. The larger taxiway OFA could result in the loss of the automobile drive lane and a portion of aircraft parking apron in the western terminal area (Sun Air and Avantair) due to the proximity of parallel Taxiway F. The plan should consider developing a new parallel taxiway which does not impact the facilities in the western terminal area in the short term. Moreover, the location of the runway system in relation to the majority of landside facilities poses taxiing challenges. A new parallel taxiway system serving Runway 8-26 will afford ground controllers additional flexibility in routing aircraft to avoid conflicts and operational delay.

While the proposed parallel runway will not be needed for some time, the parallel taxiway is needed in the short term to efficiently upgrade to ARC C/D-III standards. The complication is that a standard (400-foot separated) full length parallel taxiway to Runway 8-26 cannot be developed prior to de-

commission and removal of the terminal very high omni-directional range (T-VOR) facility. The T-VOR is not yet planned for decommission and will likely remain for some time. As a result, the plan should consider options for providing a parallel taxiway in a staged or phased manner while also considering the short and long term impacts of the development.

The following section describes three airside development alternatives. Within these alternatives are scenarios regarding the phased development of a parallel taxiway to ultimately serve, in whole or in part, as the proposed parallel runway. Also considered are other taxiway improvements including the removal of portions or all of some existing taxiway pavements. The resultant alternatives will provide a full length parallel taxiway 400 feet south of existing Runway 8-26 and a 3,500-foot by 75-foot parallel runway. These alternatives also depict the ultimate RPZ associated with the approach procedures discussed in previous sections.

AIRFIELD ALTERNATIVE A

The first airfield alternative depicted on **Exhibit 4D** presents the most simplistic staged or phased approach to developing the parallel runway/taxiway system. As depicted on the top half of the exhibit, Phase I of the proposed development would include the construction of a full length parallel taxiway situated 700 feet south of Runway 8-26 (centerline to centerline). The easternmost and westernmost portions of the taxiway would be 50 feet wide to meet ARC C/D-III standards. A 3,500-foot section of the taxiway would be constructed at 75 feet wide, and it is this portion that would ultimately be utilized as the proposed parallel runway. Another Phase I improvement would include reconfiguring Taxiway B to serve as a high speed exit for both operational directions.

Phase II development, depicted on the bottom half of **Exhibit 4D**, includes the construction of a new parallel taxiway situated 400 feet south of Runway 8-26. Of course, this could not be undertaken until the T-VOR is decommissioned. Once the standard parallel taxiway is developed 400 feet from Runway 8-26, the parallel runway could become operational. Phase II would also include the removal or reconfiguration of a portion or all of all existing exit taxiways replaced by right angled taxiways.

It should be noted that each airfield alternative considers the implementation of a straight-in instrument approach with CAT I minimums on Runway 26 and not lower than three quarters of a mile visibility minimums on Runway 8. As depicted on **Exhibit 4D**, a MALS is proposed on Runway 8. The MALS lights begin approximately 200 feet from the runway threshold and are spaced to a maximum distance of 1,400 feet. A MALSR is proposed for Runway 26 which combines a MALS with a 1,000-foot sequenced flashing runway alignment light system. It should be noted that the approach lighting systems depicted on all airside alternative exhibits provide a general layout of what the system

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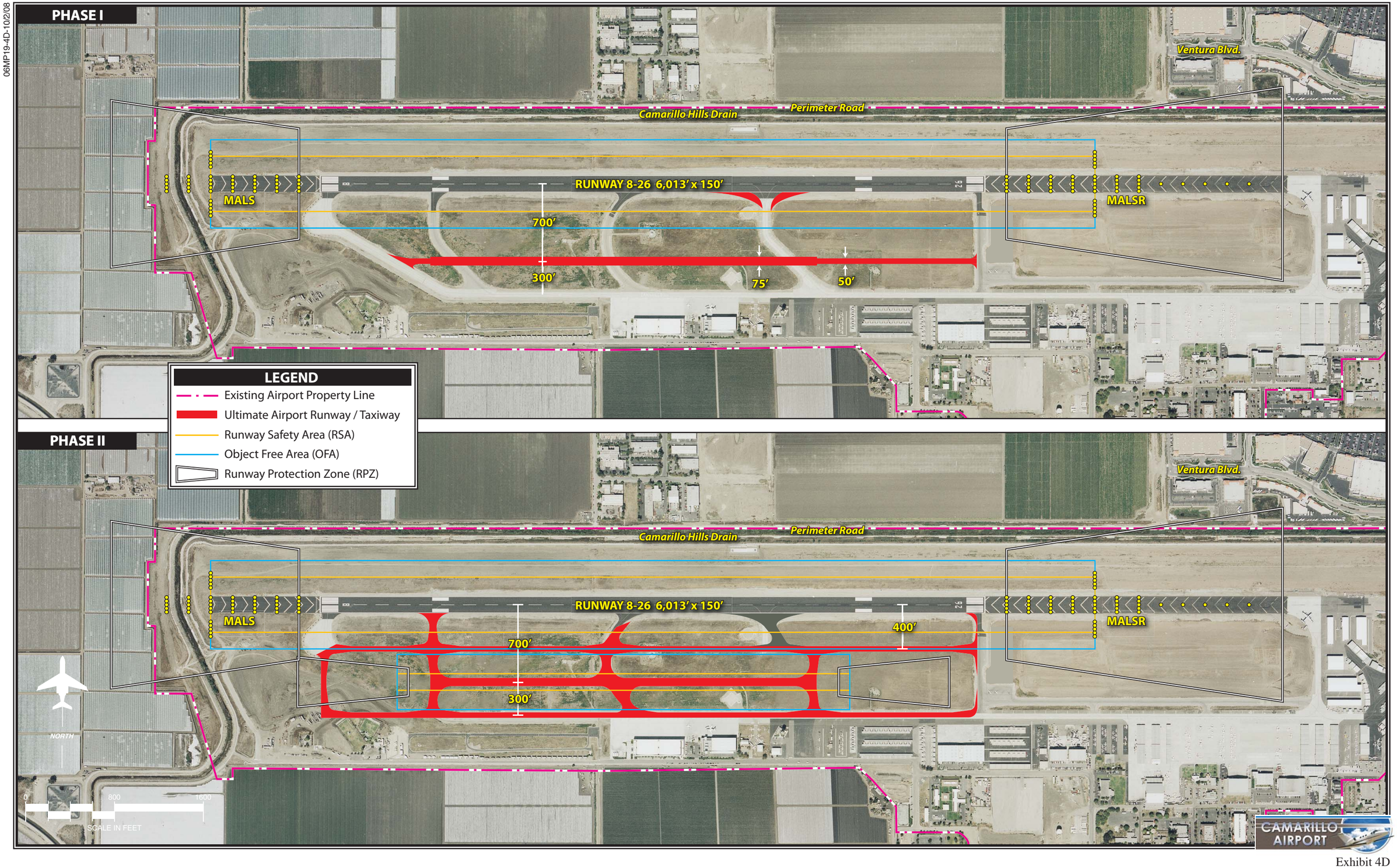

Exhibit 4D
AIRFIELD ALTERNATIVE A

may look like. Further engineering analysis, separate from this Master Plan, would determine the exact location of the approach lighting system.

With the onset of improved instrument approach procedures to Runway 8-26, the proposed RPZ will further expand to include areas outside existing airport property. The FAA places a high priority on maintaining an RPZ with little or no development and/or congestion. As noted earlier, however, the expanded RPZ areas fall within existing avigation easements. As a result, no further property acquisition is necessary as long as the area is remains free of uses that invite the congregation of people. If the easements do not shield against this stipulation, the County should consider the fee simple acquisition of these areas.

Advantages: The initial parallel taxiway concept would provide a linear (straight) taxiway with a portion ultimately usable as a parallel runway. The Phase I improvement would allow ADG III aircraft a route which would not require the closure of the automobile drive lane and some aircraft apron in the western terminal area. Ground control of taxi would be provided greater flexibility, thereby, increasing operational efficiency and minimizing operational delay.

Disadvantages: The primary disadvantage of this phased approach would be the cost of constructing pavement that will be ultimately removed. The 50-foot portions of the Phase I parallel taxiway would need to be removed prior to the opening of the parallel runway. Moreover, the parallel runway could not be utilized until the new, or Phase II standard parallel taxiway to Runway 8-26 is developed.

AIRFIELD ALTERNATIVE B

Airfield Alternative B, presented on **Exhibit 4E**, depicts the second approach to a phased development of a parallel runway and a new parallel taxiway to serve Runway 8-26. This alternative significantly differs from the previous in that its primary goal is to minimize the cost of constructing pavements which will be ultimately removed.

Exhibit 4D presents the Phase I short term (top half) and Phase II long term (bottom half) developments aimed at improving airfield capacity and taxiway efficiency. The Phase I development would include the construction of two sections of the ultimate standard parallel taxiway 400 feet south of Runway 8-26. The western section would link Taxiway E with Taxiway D. The eastern section would link Taxiway A to the proposed east end of the ultimate parallel runway. The taxiways would then be linked with right angled taxiways to what will eventually be utilized as the 3,500-foot long parallel runway. The Phase I plan also considers reconfiguring Taxiway B to serve as a high speed exit.

The Phase II development plan would extend the standard parallel taxiway from Taxiway D to the previously developed leg extending from Taxiway A. As a result, Runway 8-26 would be served by a full length parallel tax-

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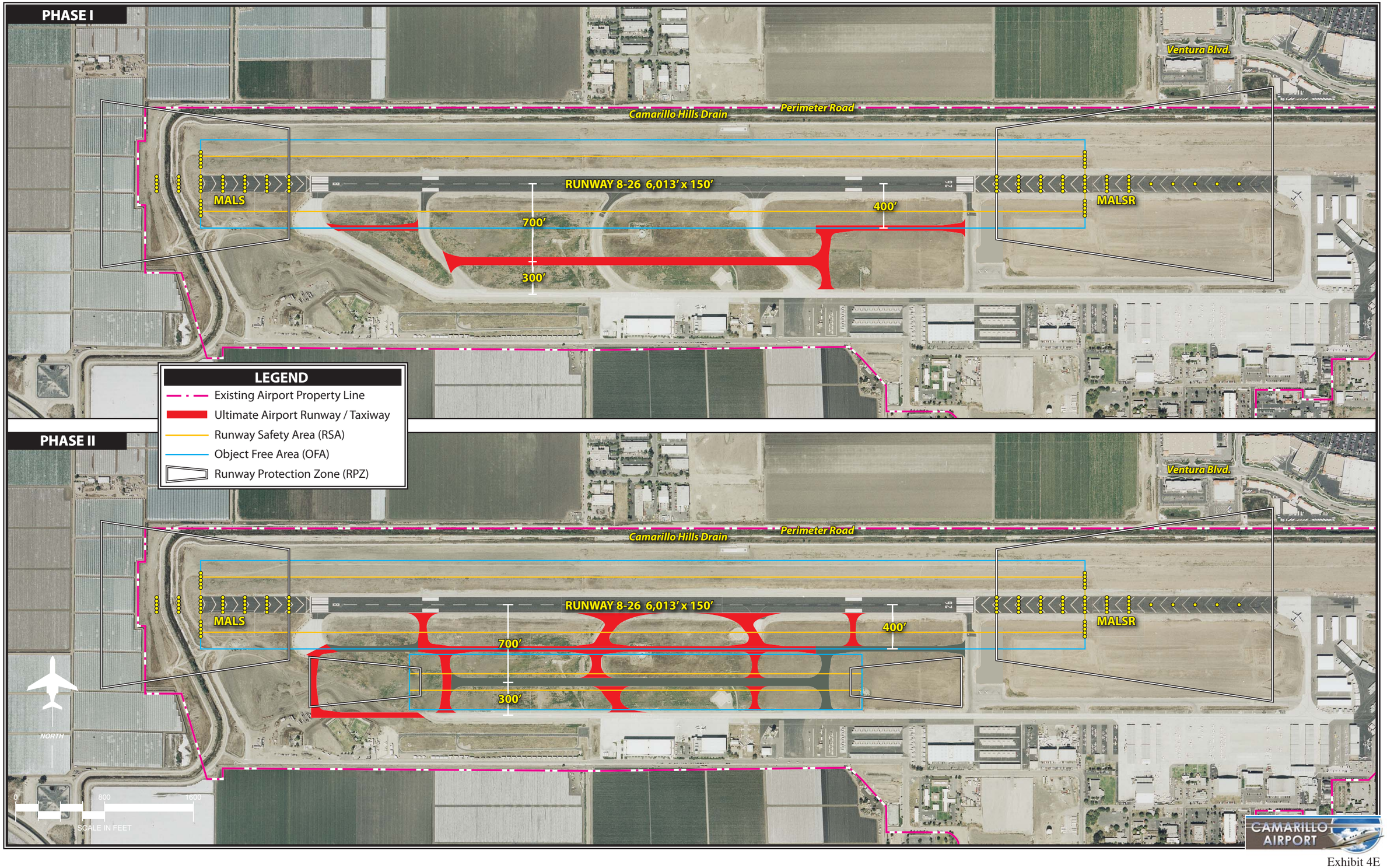
PHASE I



CAMARILLO AIRPORT

Exhibit 4E
AIRFIELD ALTERNATIVE B

iway located 400 feet south of the runway which would meet FAA standard. Two additional entrance and exit taxiways connecting Runway 8-26 with the parallel taxiway as the reconfiguration of Taxiway C to operate as a high speed exit are proposed to enhance airfield efficiency.

The plan also considers the removal of existing Taxiways B, D, and E along with a slight modification of Taxiway C. Existing Taxiway E would be replaced with a new right-angled taxiway as depicted on the exhibit. At this point, the proposed parallel runway could be opened for use.

As with the previous alternative, Runway 8 and 26 are planned for improved approaches. As a result, a MALS is depicted for Runway 8 and a MALSR for Runway 26.

Advantages: While not fully parallel (straight), the short term taxiway layout would allow ground control to route larger aircraft in a manner that avoids the western terminal facilities. Moreover, the system would provide controllers with more flexibility in moving higher volumes of aircraft. This taxiway development approach would not require the construction of pavements that would later need to be removed, thereby, saving costs associated with Alternative A. Finally, this alternative could allow the proposed parallel runway to be utilized prior to the development of a standard full length parallel taxiway to Runway 8-26 as the eastern and western sections would be available for routing.

Disadvantages: The Phase I taxiway layout could cause confusion to pilots as the portion which will ultimately serve as the parallel runway could be confused as an existing runway.

AIRFIELD ALTERNATIVE C

A third option for accommodating airside needs is depicted on **Exhibit 4F**. This alternative takes a similar phased approach as Airfield Alternative B. The primary difference is the ultimate location of the proposed parallel runway. In the previous alternative, the proposed parallel runway would be bound on the west by Taxiway D while in Airfield Alternative C, the parallel runway would be bound by Taxiway E. As a result, the ultimate layout of the proposed parallel runway would be shifted approximately 500 feet west.

The Phase I development in Alternative C mirrors the previous alternative with the exception that the eastern portion of the partial parallel taxiway would extend from Taxiway A to Taxiway B. Taxiway B would serve as the eastern end of the proposed parallel runway. Similar to the previous alternative, the western portion of the partial parallel taxiway for Runway 8-26 would extend from Taxiway D to Taxiway E. The proposed ultimate layout of the parallel runway would then serve as the remainder of the Phase I parallel taxiway.

Ultimately, Phase II considers the development of the standard full length

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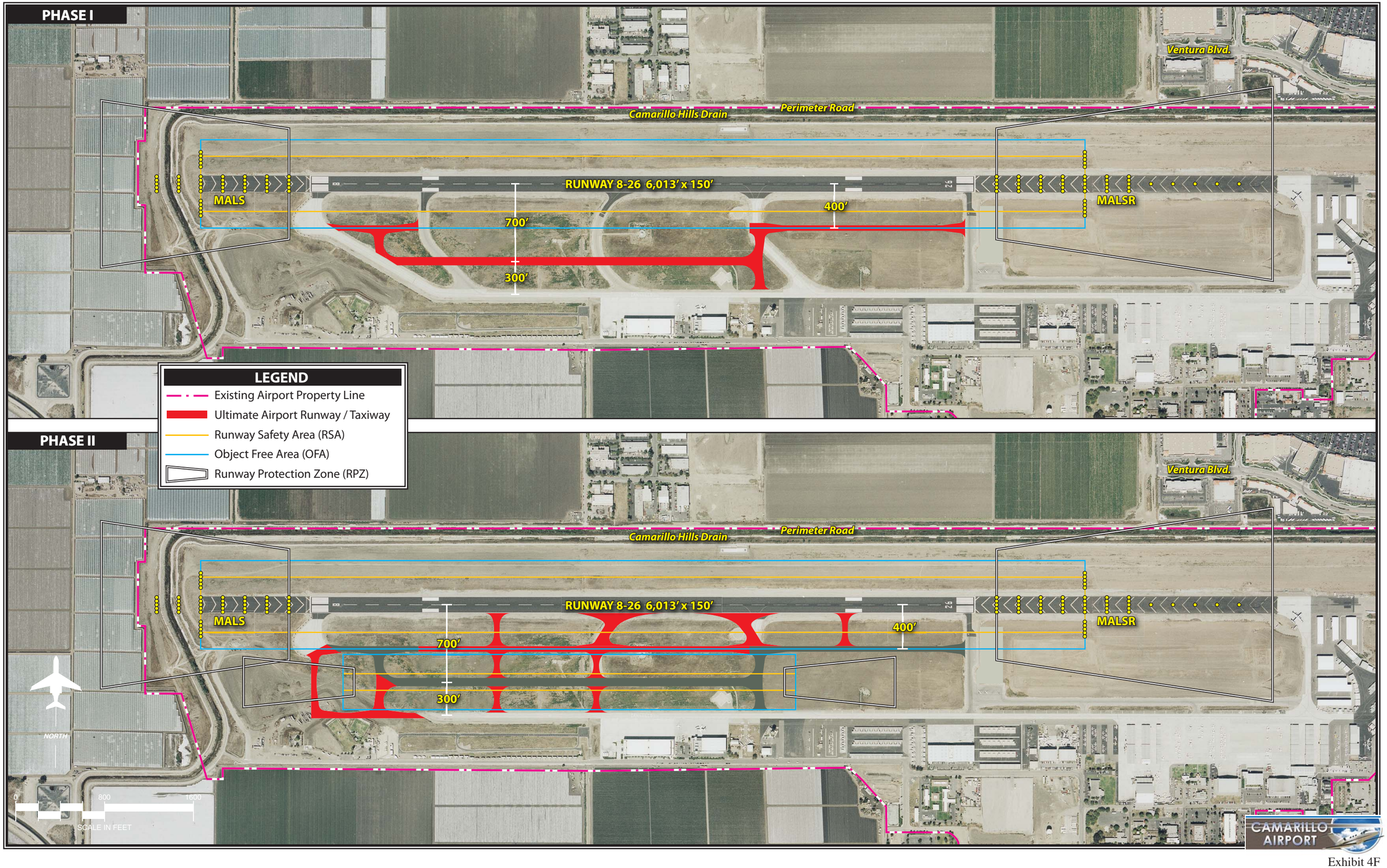
PHASE I



CAMARILLO AIRPORT

Exhibit 4F
AIRFIELD ALTERNATIVE C

parallel taxiway to Runway 8-26 (after decommission of the T-VOR) and construction of two new entrance/exit taxiways. Taxiways B and C would be reconfigured to serve as high speed exit taxiways. Existing Taxiways B, C, D, and E would be reconfigured or removed altogether and replaced with right-angled taxiways as depicted.

Proposed development in Airfield Alternative C includes improving the instrument approach procedures suggested in the previous alternatives. As a result, a MALSR is depicted on Runway 26 and a MALS on Runway 8.

Advantages: Similar to the previous alternative, no pavement would be constructed then remove, thereby saving costs over Alternative A. The layout of the proposed parallel runway would lend to an easier phased development as it would utilize existing Taxiways B and E as its bounds.

Disadvantages: This alternative could lead to pilot confusion whereby pilots could mistake the Phase I partial parallel taxiway as an active runway.

AIRFIELD ALTERNATIVE SUMMARY

The three airfield development alternatives outline methods to efficiently provide a parallel runway and taxiway system. The primary goal of the alternatives was to first develop a new taxiway system for Runway 8-26 that would route aircraft around the western terminal area under the constraint of the existing T-VOR. This will be required in the short term as the airport will likely transition to ARC C/D-III. The added benefit of the improved taxiway system would be greater flexibility for ATC to route aircraft, thus, reducing operational delays.

It should be noted that another alternative was considered but not discussed in the previous section. The alternative of simply developing the full length parallel taxiway 400 feet south of Runway 8-26 in the short term was considered but rejected due to the T-VOR. The T-VOR serves as an instrument approach aid to Camarillo Airport as well as Oxnard Airport and the region as a whole. It is unlikely that the FAA will decommission the facility in the next five years. As such, this option was not considered prudent or feasible.

The three airfield alternatives present methods for achieving two goals. First, providing an enhanced taxiway system aimed at meeting ARC C/D-III standards in the western terminal area; second, increased operational efficiency would be achieved. While the end result of all three alternatives present similar outputs, Alternative A differs significantly from Alternatives B and C in the method of phasing development. Alternative A would provide a more efficient taxiway system as it will be fully parallel (straight). It will cost more, however, as some of the taxiway will ultimately need to be removed. Alternatives B and C provide a more circuitous route but would not require the removal of pavements. The primary concern with Alternative B and C would be the potential for pilots to mistake a portion of the Phase I taxiway as an active runway.

LANDSIDE PLANNING CONSIDERATIONS

The purpose of this section is to identify and evaluate viable landside alternatives at Camarillo Airport to meet program requirements set forth in Chapter Three. While the airfield is comprised of facilities where aircraft movement occurs (runway, taxiways, etc.), other "landside" functions occur outside this area. The primary aviation functions to be accomplished landside at Camarillo Airport include aircraft storage hangars, aircraft parking aprons, and automobile parking and access. The interrelationship of these functions is important to defining a long-range landside layout for general aviation uses at the airport.

The orderly development of the airport terminal area, those areas along the flight line parallel to the runway, can be the most critical, and often times the most difficult to control on the airport. A development approach of taking the path of least resistance can have a significant effect on the long-term viability of an airport. Allowing development without regard to a functional plan could result in a haphazard array of buildings and small apron areas, which will eventually preclude the most efficient use of valuable space along the flight line. It should be noted that all available flight line spaces are currently occupied. The only remaining flight line area left is currently utilized as the ultralight airpark. If the ultralight park were closed at some point in the future, additional flight line development could occur. For the purposes of this study, however, development areas are limited to the south and west.

Activity in the terminal area should be divided into high, medium, and low intensity levels at the airport. The high-activity area should be planned and developed to provide aviation services on the airport. An example of the high-activity area is a fixed base operator (FBO) and adjoining aircraft parking apron, which provides tie-down locations and circulation for aircraft. In addition, large conventional hangars utilized by FBOs, corporate aviation departments, or bulk aircraft storage would be considered a high-activity use area. The best location for high-activity areas is along the flight line near midfield, for ease of access to all areas of the airfield.

The medium-activity use category defines the next level of airport use and primarily includes smaller corporate aircraft that may desire their own executive hangar storage on the airport. The best location for medium-activity use is off the immediate flight line, but still readily accessible to aircraft including corporate jets. Parking and utilities such as water and sewer should also be provided in this area.

The low-activity use category defines the area for storage of smaller single and multi-engine aircraft. Low-activity users are personal or small business aircraft owners who prefer individual space in T-hangars or tie-downs. Low-activity areas should be located in less conspicuous areas. This use category may require electricity, but generally does not require water or sewer utilities.

Ideally, terminal area facilities at airports should follow a linear configuration parallel to the primary runway. The linear configuration allows for maximizing available space, while providing ease of access to terminal facilities from the airfield. Landside alternatives will address development in specific areas on the airport. Separation of activity levels and efficiency of layout will be discussed as well.

In addition to the functional compatibility of the terminal area, the proposed development concept should provide a first-class appearance for Camarillo Airport. As previously mentioned, Ventura County serves as a very important link to the entire region whether it is for business or pleasure. Consideration to aesthetics should be given high priority in all public areas, as the airport can serve as the first impression a visitor may have of the community.

Camarillo Airport is located on approximately 650 acres. In order to allow for maximum development of the airport while keeping with FAA mandated safety design standards, it is very important to devise a plan that allows for the orderly development of airport facilities. Typically, airports will reserve the first 1,000 feet parallel to the runway for aviation-related activity exclusively. This distance will allow for the location of taxiways, apron, and hangars.

In those circumstances where ultimate demand levels fall short of the ultimate build-out need, some airports will encourage non-aviation commercial or industrial development. The potential of non-aviation development on airport property can provide an additional revenue source in the form of long-term land leases for the airport. Aviation-related growth is forecasted to be very strong at Camarillo Airport throughout the planning period, thus, the majority of property on the airport will be dedicated for aviation use.

The alternatives to be presented are not the only options for development. In some cases, a portion of one alternative could be intermixed with another. Also, some development concepts could be replaced with others. The final recommended plan only serves as a guide for the County. Many times, airport operators change their plan to meet the needs of specific users. The goal in analyzing landside development alternatives is to focus future development so that airport property can be maximized.

Landside planning considerations were summarized previously on **Exhibit 4A**. The following briefly describes proposed landside facility improvements.

AIRCRAFT HANGAR DEVELOPMENT

The facility requirements indicated a need for the development of more aircraft storage hangars at Camarillo Airport. Hangar development takes on a variety of sizes corresponding with several different uses.

Commercial general aviation activities are essential to providing the necessary services needed on an airport. This includes businesses involved

with, but not limited to, aircraft rental and flight training, aircraft charters, aircraft maintenance, line service, and aircraft fueling. These types of operations are commonly referred to as FBOs. The facilities associated with businesses such as these include large conventional type hangars that hold several aircraft. High levels of activity often characterize these operations, with a need for apron space for the storage and circulation of aircraft. These facilities are best placed along ample apron frontage with good visibility from the runway system for transient aircraft. Utility services are needed for these types of facilities, as well as automobile parking areas.

The mix of aircraft using Camarillo Airport is expected to include more business class aircraft which have larger wingspans. These larger aircraft require greater separation distances between facilities, larger apron areas for parking and circulation, and larger hangar facilities.

Another need indicated was additional space for the storage of smaller aircraft. This primarily involves T-hangars or executive hangars. Since storage hangars often have lower levels of activity, these types of facilities can be located away from the primary apron areas, in more remote locations of the airport. Limited utility services are needed for these areas such as electricity, but may or may not also include water and sanitary sewer.

Other types of hangar development can include clearspan hangars for accommodating several aircraft simultaneously. Typically, these types of hangars are used by corporations with company-owned aircraft or by an individual or group of individuals with several aircraft. These hangar areas require all utilities and segregated roadway access.

The original development of what is now Camarillo Airport basically segregated airside and landside facilities. The majority of landside facilities are situated east of Runway 8-26. Recent developments including Sun Air and Avantair have placed FBO facilities directly on the flight line. These facilities, however, have used nearly all remaining flight line space. Future space could be gained if the ultralight airpark was closed; however, its closure is neither planned nor likely to occur in the near future. Therefore, the efforts in this study will focus on two areas for future landside development: the area adjacent to the existing fuel farm and the area at the easternmost portion of airport property north of the alert area. These two areas can provide ample spaces to meet future aviation demand.

A significant consideration for landside development in the vacant area at the east end of the airport is the lack of automobile access. Facilities in the alert area can only be accessed via entrance through an electronic gate and then traversing the area's taxilanes. This situation is currently acceptable; however, adding additional facilities even further north of the existing facilities could pose efficiency and safety risks. Furthermore, the FAA has expressed a desire to bolster security at general aviation airports which could ultimately preclude such operational conditions. Therefore, analysis should also consider the development of a

new arterial roadway that could serve any new facilities in the easternmost portion of the terminal area. This would require developing a road from either Los Posas Road to the east or Ventura Boulevard from the north. Each option will be evaluated in the next section.

Another consideration that should be evaluated is the instrument approach minimums for Runway 26. The current approach minimums of not lower than three quarters of a mile has an associated RPZ that is 1,700 feet long beginning 200 feet east of the runway end. Analysis in the previous chapter indicates that consideration should be given to the implementation of a CAT I approach to Runway 26. A CAT I approach has a much larger associated RPZ which extends 2,500 feet from its originating point 200 feet east of the runway end. The primary consideration here is that the improved instrument approach will reduce the amount of area available for landside development east of the runway. The alternatives discussed in the next section will outline the differences.

LANDSIDE DEVELOPMENT ALTERNATIVES

A series of landside alternatives have been examined for the two areas available for development outlined earlier. These alternatives consider general aviation facility development, new roadway options, and instrument approach considerations. The goal of this analysis is to indicate development potentials which would provide Camarillo Airport with a specific goal for future development. The resultant plan will aid the County in strategic marketing of available airport properties.

LANDSIDE ALTERNATIVE 1

Landside Alternative 1, depicted on **Exhibit 4G**, considers that Runway 26 will not be upgraded to a CAT I approach. As such, the associated RPZ is smaller allowing for a larger development area. This alternative would provide approximately 50 acres of land on which an array of aviation facilities could be located.

Landside Alternative 1 also considers the development of a new road linked to Los Posas Road, directly west of Camarillo Center Drive. As depicted, the road could serve the entire eastern development area. The drawback of this road option is the design of Los Posas Road. The City of Camarillo may object to another access point of this main thoroughfare as the new road would create an intersection that may need to be lighted.

Alternative 1 considers the development of three types of hangars in the eastern terminal area all aligned in a north/south manner. The larger conventional hangars would be located nearer Taxiway G and would be west facing. Immediately behind these facilities, three rows of executive box hangars are shown. Further east, five rows of T-hangars are proposed.

The second landside development area is focused on the property adjacent to the existing fuel farm. The depicted

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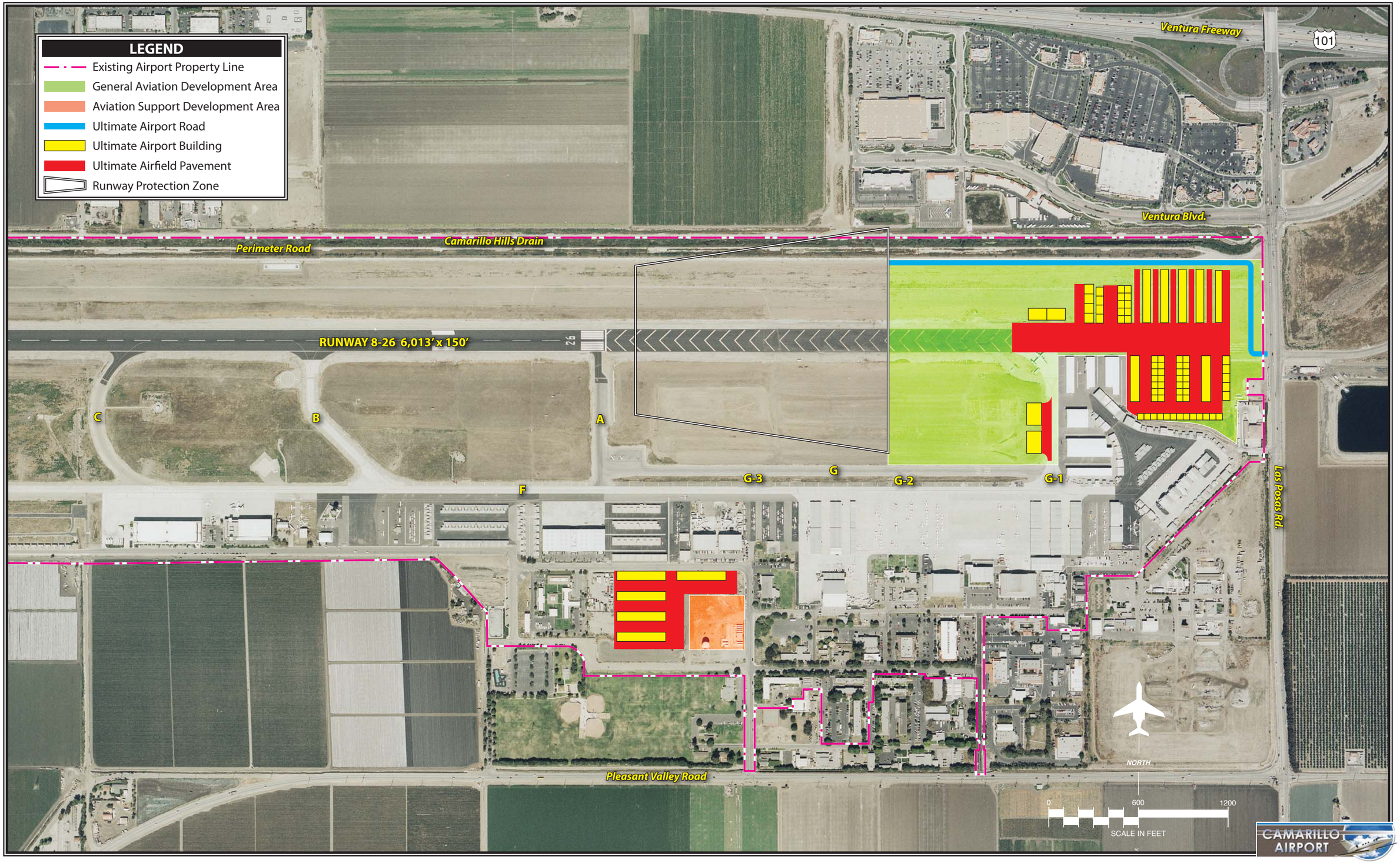

Exhibit 4G
LANDSIDE ALTERNATIVE I
(3/4 MILE APPROACH TO RUNWAY 26)

layout of T-hangar or connected executive box hangars is similar to the existing plan on the ALP. The primary change is the fuel farm is planned to remain and allowed additional expansion space. As a result, the area could support the location of five additional hangar facilities. It should be noted that this development requires the closure of a portion of Aviation Drive so that aircraft could access the airfield. Roadway access would then need to be routed around the development area to the south and reconnect to Aviation Drive to the west.

LANDSIDE ALTERNATIVE 2

Landside Alternative 2 is depicted on **Exhibit 4H** and considers the implementation of a CAT I approach to Runway 26. As such, less space is available in the eastern terminal area. Approximately 30 acres would be available, 20 acres less than the previous alternative.

Alternative 2 considers a second option for providing roadway access to the eastern terminal area. As proposed, a road would be developed from Ventura Boulevard to the north. This road would require a bridge over the Camarillo Hills Drain. As a result, this option would be more costly. Its implementation, however, may be more acceptable to the City of Camarillo since Ventura Boulevard is more of a secondary arterial roadway which could support another access point.

Proposed development in the eastern terminal area is aligned in an east/west manner under Alternative 2. As depicted on the exhibit, the southernmost facilities would include large conventional and box hangars. To the north of the conventional hangars, four T-hangar facilities area proposed.

This alternative continues the proposed development considered in the previous alternative for the area adjacent to the fuel farm. While other hangar options could be considered, the area is not suitable for high activity levels. As such, the proposed layout would provide the most efficient use of space for low activity level hangar facilities.

LANDSIDE ALTERNATIVE SUMMARY

As presented, both alternatives should be capable of accommodating projected aviation demand for the long term. Alternative 1 provides a larger area for development in the eastern terminal area (20 more acres); however, the alternative requires abandoning the option of acquiring a CAT I approach to Runway 26. While Alternative 2 has less space available, it still provides adequate spaces to meet future demand. The road improvements proposed differ significantly. While a road off of Los Posas would be less expensive to construct, it may not be allowed by the City of Camarillo due to traffic constraints. The proposed road linking the eastern terminal area with Ventura Boulevard to the north will be costly as it requires a bridge over the Camarillo Hills Drain, however, it may be more acceptable to the City of Camarillo.

06MP19-4H-10/2/08

LEGEND

- Existing Airport Property Line
- General Aviation Development Area
- Aviation Support Development Area
- Ultimate Airport Road
- Ultimate Airport Building
- Ultimate Airfield Pavement
- Runway Protection Zone

Ventura Freeway
101
Ventura Blvd.
Camarillo Hills Drain
Perimeter Road
RUNWAY 8-26 6,013' x 150'
26
C
B
A
G
G-3
G-2
G-1
F
Las Posas Rd.
Pleasant Valley Road
NORTH
0
600
1200
SCALE IN FEET
CAMARILLO AIRPORT

Exhibit 4H
LANDSIDE ALTERNATIVE II
(CAT I APPROACH TO RUNWAY 26)

SUMMARY

The process utilized in assessing the airside and landside development alternatives involved a detailed analysis of short and long term requirements, as well as future growth potential. Current and future airport design standards were considered at every stage in the analysis. Safety, both in the air and on the ground, was given a high priority in the analysis of alternatives.

After review and input from the PAC, airport administration, as well as County and City officials, a recommended concept will be developed by the consultant. The resultant plan will represent an airside facility that fulfills the safety design standards and a landside complex that can be developed as demand dictates. The development plan for Camarillo Airport must represent a means by which the airport can evolve in a balanced manner, both on the airside and landside, to accommodate the forecast demand. In addition, the plan must provide flexibility to meet activity growth beyond the long range planning horizon.

The following chapters will be dedicated to refining the basic concept into final plan, with recommendations to ensure proper implementation and timing for a demand-based program.

CHAPTER FIVE

RECOMMENDED MASTER PLAN CONCEPT

CHAPTER FIVE

RECOMMENDED MASTER PLAN CONCEPT

The airport master planning process for Camarillo Airport (CMA) has evolved through the development of forecasts of future demand, an assessment of future facility needs, and an evaluation of airport development alternatives to meet those future facility needs. The planning process has included the development of two phase reports which were presented to the Planning Advisory Committee (PAC) and discussed at several coordination meetings and a public information workshop. Ventura County has participated in each of these meetings and has been actively involved in the master planning process.

The PAC is comprised of several constituencies with an investment or interest in Camarillo Airport. Groups represented on the PAC include the Federal Aviation Administration (FAA), the California Department of Transportation - Division of Aeronautics (CALTRANS), the Ventura County Airport Land Use Commission, City of Camarillo, airport management, airport traffic control tower personnel, airport businesses, and local and national aviation associations. This diverse group has provided extremely valuable input into this recommended plan.

In the previous chapter, several development alternatives were analyzed to explore options for the future growth and development of Camarillo Airport. The development alternatives have been refined into a single recommended concept for the master plan. This chapter describes, in narrative and graphic form, the recommended direc-

tion for the future use and development of Camarillo Airport.

RECOMMENDED MASTER PLAN CONCEPT

The recommended master plan concept incorporates elements from each of the airside and landside alternatives presented in the previous chapter. This concept provides the airport with the ability to meet the increasing demands on the airport by larger corporate aircraft, while also providing adequate space for smaller piston aircraft operators. The recommended master plan concept, as presented on **Exhibit 5A**, presents the ultimate configuration for the airport that preserves and enhances the role of the airport while meeting FAA defined design standards. A phased program to implement the recommended development configuration will be presented in Chapter Six - Capital Improvement Program. The following sub-sections will describe the recommended master plan concept in detail.

AIRSIDE CONCEPT

The FAA has established design criteria to define the physical dimensions of runways and taxiways, as well as the imaginary surfaces surrounding them which protect the safe operation of aircraft at the airport. These design standards also define the separation criteria for the placement of landside facilities.

As discussed previously, FAA design criteria primarily center around the airport's critical design aircraft. The critical aircraft is the most demanding aircraft or family of aircraft which currently, or are projected to, conduct 500 or more operations (take-offs and landings) per year at the airport. Factors included in airport design are an aircraft's wingspan, approach speed, tail height and, in some cases, the instrument approach visibility minimums for each runway. The FAA has established the Airport Reference Code (ARC) to relate these critical aircraft factors to airfield design standards.

Analysis conducted in Chapter Three - Facility Requirements concluded that the current critical aircraft is defined by turboprops and business jets in ARC C/D-II including the Gulfstream II, III, and IV. While the airport is home to aircraft in ARC C/D-III including the Global Express and Gulfstream V, these aircraft have not yet met the critical aircraft threshold of 500 annual operations.

The master plan anticipates that business jet aircraft using the airport will increase in the future, consistent with local and national historic trends. The current economic recession will likely moderate any growth in the short term; however, as the recession subsides and turns, Camarillo Airport will be positioned for a return to growth. Strong employment and population bases in the Ventura County area will contribute to strong growth in aviation activity at the airport. Camarillo Airport is the most substantial general aviation airport in the region. Historically, Camarillo Airport has been the most utilized of all the regional airports as it has the most abundant aviation facilities and amen-

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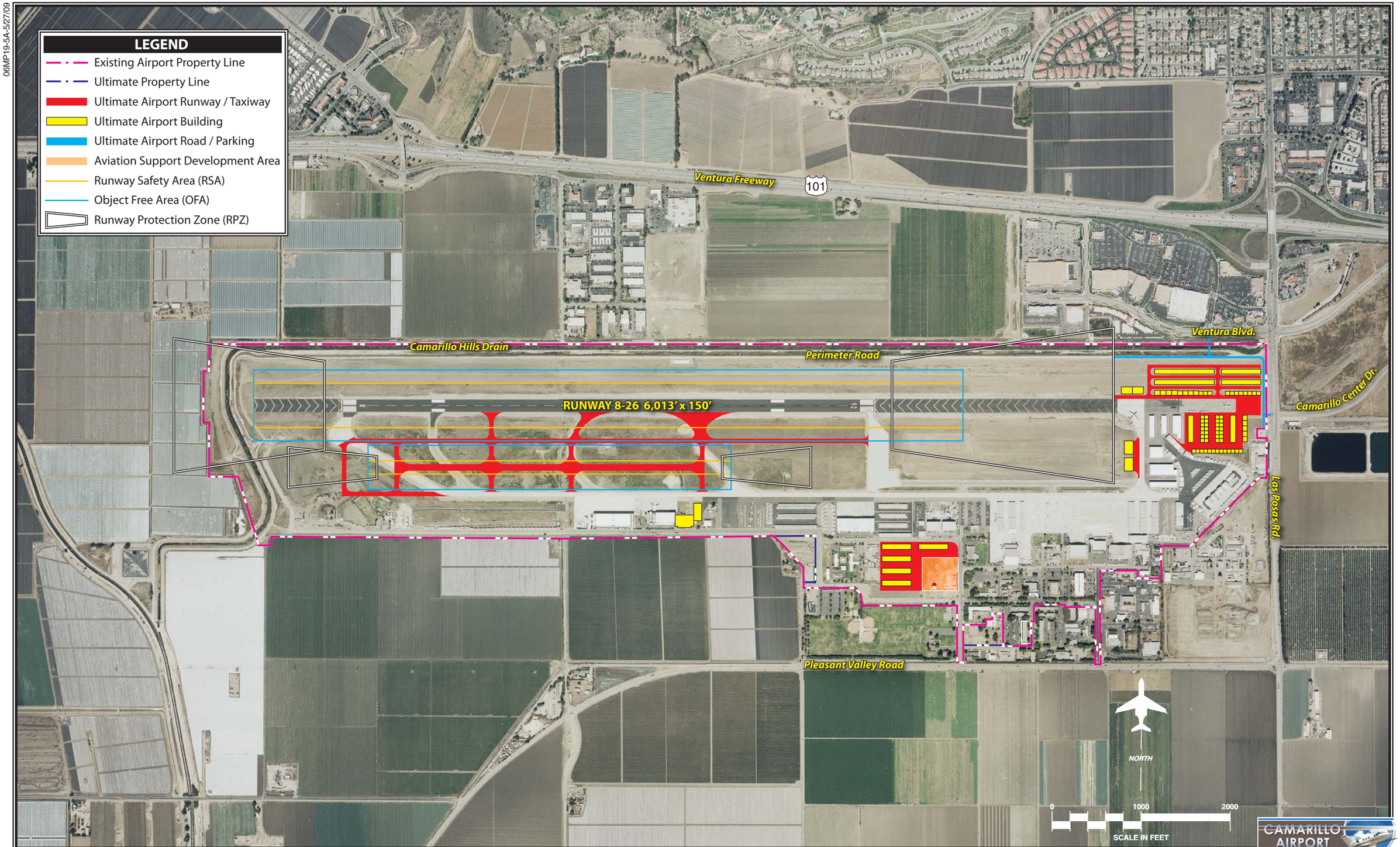


Exhibit 5A
MASTER PLAN CONCEPT

ities/services in the region. Therefore, future planning should continue to consider increased use of CMA by all general aviation segments. As a result, planning for a future critical aircraft in ARC C/D-III is proposed which includes the Global Express and G-V business jets.

While airfield elements must meet design standards associated with a critical aircraft in ARC C/D-III, landside elements can be designed to accommodate specific categories of aircraft. For example, an airfield taxiway is required to provide object free area width for the most demanding or critical aircraft. A taxilane into a T-hangar area, however, only needs to meet the object free area width standard for smaller single and multi-engine piston aircraft expected to utilize the taxilane, not those for the larger business jets representing the overall critical aircraft.

Table 5A presents the design standards to be applied to the airfield at Camarillo Airport. The plan proposes the development of a small parallel runway to be utilized for small aircraft exclusively. Applicable FAA design standards are included in the table for the parallel runway as well.

Runway 8-26

The appropriate runway length to meet the needs of existing and future aircraft operators at Camarillo Airport has been discussed previously in Chapters Three and Four. It was determined that at its current length of 6,013 feet, Runway 8-26 is capable of accommodating the majority of current and future aircraft operations.

While additional runway length could be advantageous for some operators with long trip lengths, the additional length would exceed the need of most operators. Moreover, an existing agreement between the City of Camarillo and Ventura County limits the runway to its current length. Any extension would require a change to this agreement. As noted earlier, a longer runway could aid a few operations per year; however, it would not significantly improve the operational capabilities of current and/or future airport users. As such, the existing runway length is considered adequate and will remain at 6,013 feet under this planning effort.

Runway 8-26 is currently 150 feet wide. This width exceeds the FAA design standard of 100 feet for ARC C/D-II and for most aircraft in ARC C/D-III. While the width exceeds FAA standard, it is desired for larger business jets such as the G-V and Global Express. As such, the current width satisfies current and future aircraft operators and should be maintained in the future.

The Runway 8-26 pavement has been strength-rated at 50,000 pounds single wheel gear loading (SWL), 80,000 pounds dual wheel loading (DWL), and 125,000 pounds dual tandem wheel loading (DTWL). This strength is capable of meeting the needs of most current and projected aircraft operations. It does fall slightly short of the needs of G-V and Global Express business jets. Consideration

should be given to increasing the strength loading to 100,000 pounds DWL in the future. The current pavement strength can accommodate the larger aircraft; however, the pavement could prematurely age due to operations by these aircraft on a frequent basis.

TABLE 5A
Airfield Planning Design Standards
Camarillo Airport

	FAA ARC C/D-II Design Standard	FAA ARC C/D-III Design Standard	Parallel Runway*
Runways			
Width	100	100	60
Shoulder Width	10	**20**	10
Runway Centerline to:			
Hold Position	250	250	200
Parallel Taxiway to Runway Centerline	400	400	240
Edge of Aircraft Parking Area	500	500	400
Runway Safety Area			
Width	500	500	120
Length Beyond End	1,000	100	240
Length Prior to Landing	600	600	240
Object Free Area			
Width	800	800	250
Length Beyond End	1,000	1,000	240
Length Prior to Landing	600	600	240
Obstacle Free Zone			
Width	400	400	250
Length Beyond End	200	200	200
Taxiways			
Width	35	50	25
Safety Area Width	79	118	49
Object Free Area Width	131	186	89
Taxiway Centerline to:			
Fixed or Movable Object	65.5	93	44.5
Parallel Taxiway/Taxilane	105	152	69
Taxilanes			
Object Free Area Width	115	162	79
Taxilane Centerline to:			
Fixed or Movable Object	57.5	81	39.5
Parallel Taxiway/Taxilane	97	140	64

*Small aircraft exclusively (Piaggio P180 critical aircraft ARC B-I)
Source: FAA AC 150/5300-13, Airport Design, Change 14

Runway 8-26 currently meets all FAA safety standards for ARC C/D-II aircraft design including runway safety area (RSA), object free area (OFA), obstacle free zone (OFZ), and runway hold line markings. All of these standards remain the same for an upgrade to ARC C/D-III aircraft design. As such, the current airfield layout will meet the future safety standards for an upgrade to ARC C/D-III aircraft design.

Parallel Runway

Analysis in Chapter Three indicated that projected aircraft operations

would significantly increase operational delays due to capacity constraints of a single runway layout. The results of that analysis also indicated that the airfield will exceed the FAA's threshold for capacity and delay for which capacity improvements should be made. The greatest improvement to airfield congestion and delay is the addition of a parallel runway. Adding a parallel runway can nearly double the airfield's operational capacity, thereby significantly reducing operational delays and costs associated with those delays.

The recommended development concept includes the construction of a parallel runway. The proposed parallel runway is planned to be located 700 feet south of existing Runway 8-26, between Taxiways Bravo and Echo as depicted on **Exhibit 5A**. The parallel runway is proposed for use by small aircraft exclusively, which are those up to ARC A/B-I weighing 12,500 pounds or less. Under this design, the proposed parallel runway has been planned at 3,500 feet in length and 75 feet in width. The length and width of the runway will allow it to serve all small aircraft and some light twin and turbine aircraft such as the Piaggio P180. The planned separation from the existing runway is the minimum distance allowed for parallel runways and would not allow for simultaneous operations on both runways; however, it would allow for staggered operations.

Runway Protection Zone

The runway protection zone (RPZ) is a trapezoidal area generally beginning 200 feet from the runway end and extending out in accordance with the critical aircraft at the airport and/or the instrument approach visibility minimums. The function of the RPZ is to enhance the protection of people and property on the ground. As airports transition from one critical aircraft to a larger critical aircraft or as more sophisticated instrument approaches are approved, the size of the RPZ can change. The FAA recommends the airport have positive control of the RPZ through fee-simple ownership if possible. If fee-simple ownership is not feasible, avigation easements for areas in the RPZ should be acquired.

The Runway 26 Global Positioning System (GPS) LPV approach currently provides the lowest instrument visibility approach minimums at 0.75 mile. The associated RPZ for this approach has an inner width of 1,000 feet, an outer width of 1,510 feet, and an overall length of 1,700 feet. The recommended concept includes an improved procedure to Category I (CAT I) minimums (200-foot cloud ceilings and one-half mile visibility). The RPZ associated with this type of approach increases to 2,500 feet long with an outer width of 1,750 feet. The inner width remains at 1,000 feet. The majority of the property in the existing and planned Runway 26 RPZ is owned in fee, while the small portion that extends beyond airport property is owned in avigation easement.

The existing RPZ for Runway 8 is associated with the nonprecision approach providing minimums of not lower than one mile. Future plans call for a not lower than 0.75 mile visibility which would have an associated

RPZ that mirrors the existing Runway 26 RPZ. Much of the existing and ultimate RPZs for Runway 8 extend beyond existing airport property; however, an avigation easement is maintained for the areas beyond property bounds.

The RPZs for the proposed parallel runway are associated with visual approaches serving small aircraft only. Both RPZs for the proposed parallel runway fall within existing airport boundaries.

TABLE 5B
Runway Protection Zone Standards
Camarillo Airport

	Current		Future		Future Proposed
	Runway 8	Runway 26	Runway 8	Runway 26	Parallel Runway*
Visibility Minimum	1.0 Mile	0.75 Mile	0.75 Mile	0.5 Mile	Visual Only
Inner Width	500'	1,000'	1,000'	1,000'	250'
Outer Width	1,010'	1,510'	1,510'	1,750'	450'
Length	1,700'	1,700'	1,700'	2,500'	1,000'

*Small aircraft exclusively
Source: FAA AC 150/5300-13, Airport Design, Change 14

Taxiways

Taxiways are designed to safely and efficiently route aircraft to and from the airfield environment. Their design follows FAA guidance and is also related to the critical aircraft. The most important design element to consider for taxiway design is the critical aircraft's wingspan, or airplane design group (ADG). The overall ARC is important when considering separation of the parallel taxiway from the runway.

Runway 8-26 is currently served by full length parallel Taxiway F. Parallel Taxiway F is 50 feet wide and is separated from Runway 8-26 by 1,000 feet, centerline to centerline. A full length parallel taxiway is imperative for high density reliever general aviation airports such as CMA.

The current location and layout of Taxiway F, however, presents operational efficiency issues. Taxiway F traverses the outer, northern boundary of the south fixed base operator (FBO) complex. The south FBO facilities have limited ramp available and the location of Taxiway F limits ramp space. Furthermore, the airport has implemented an automobile drive lane along the southern edge of Taxiway F which was designed for ARC C/D-II taxiway OFA. Finally, the eastern portion of Taxiway F that flows into the main terminal area is limited due to the automobile drive lane and hangars. While Taxiway F serves aircraft up to ARC C/D-II aircraft movements sufficiently, it does not meet standards for ARC C/D-III aircraft such as the G-V and Global Express. As previously noted, the G-V and Global Express aircraft are currently based at the airport but have not met the threshold for critical aircraft operations. They are expected to meet and exceed this threshold in the near future.

In order to meet ADG III taxiway OFA and efficiency for parallel taxiway op-

erations, the recommended concept includes the long term construction of a parallel taxiway for Runway 8-26. The planned parallel taxiway would be located 400 feet south of the existing Runway 8-26, centerline to centerline, and would be 50 feet wide. It should be noted that this taxiway could not be constructed until the terminal VOR were removed. At this time, the FAA and airport administration do not desire to decommission the VOR as it serves Camarillo Airport approach procedures as well as approach procedures at Oxnard Airport and as a regional approach aid for navigational purposes. As a result, the recommended plan includes the short term development of a parallel taxiway located 700 feet south of Runway 8-26 and 400 feet north of existing Parallel Taxiway F. A portion of this new taxiway could ultimately serve as the proposed parallel runway if demand dictates in the long term planning period. Construction of the second parallel taxiway would enhance and improve aircraft operational safety and efficiency. Moreover, the taxiway will allow for large aircraft in ADG III to efficiently circumvent the western FBO area where apron space is limited.

The remaining taxiway improvements proposed in the recommended concept are generally minor. Taxiways B, C, and D would be reconfigured to become 90-degree angled taxiways. Taxiway B would become a high speed taxiway for both operational flow directions on Runways 8 and 26.

Airside Conclusion

The recommended airside development concept generally focuses on improving airfield capacity and efficiency. The existing Runway 8-26 is proposed to remain at its current length and width. A 3,500-foot parallel runway is proposed to be constructed 700 feet south of the existing runway (the portion of the short term parallel taxiway concept from Taxiway B to E). This runway would serve small aircraft operations and would alleviate airfield congestion by accepting training and transient operations by small aircraft only. That will allow the existing runway to serve larger aircraft which utilize the runway environment for longer periods of time. As noted, the proposed parallel runway would only be developed if aviation demand dictates and proper justification is met for FAA funding assistance.

Improved instrument approach procedures are also proposed. Runway 26 is planned for a CAT I GPS approach, while Runway 8 is planned for a non-precision GPS LPV approach providing not lower than 0.75 mile visibility. All associated RPZs are within current airport property or in areas that are currently under avigation easement.

LANDSIDE CONCEPT

The primary goal of landside facility planning is to provide adequate aircraft storage space to meet forecast need while also maximizing opera-

tional efficiencies and land uses. Achieving this goal yields a development scheme which segregates aircraft activity levels while maximizing the airport's revenue potential. **Exhibit 5A** depicts the recommended landside development plan for the airport.

The recommended landside concept for the airport terminal area most closely resembles Exhibit 4H – Landside Alternative II, previously presented in Chapter Four. The recommended plan primarily focuses on undeveloped land in the easternmost portion of the airport; however, an area near the fuel farm is also proposed for development.

The eastern terminal area is being planned for all types of landside aviation activities. As depicted on the exhibit, the functional core of the area will be a paved apron/taxiway that extends east from the chevronned, abandoned runway. It should be noted that these facilities were planned so as to be outside of the CAT I RPZ planned for Runway 26. Moreover, the area directly on centerline of the runway would be for aircraft movements and parking only, not to include aircraft hangars.

To the south of the new apron is planned a private executive and T-hangar development area. As proposed, the area could support up to 13 small executive box hangars, and a mix of five joined/nested executive box and T-hangar facilities. As noted, this area will consist entirely of privately developed hangars through a ground lease with the Ventura County Department of Airports.

The development north of the proposed apron would also consist of executive and T-hangars; however, these hangars are planned to be developed by the County. As depicted, up to 20 executive box hangars could line the apron with four nested T-hangar facilities behind or east of the executive hangars.

The east area could also support four large conventional hangars as depicted. Two of the hangars could be developed on the north side and front the new apron, facing south. Two conventional hangars are depicted to the south and would be aligned east facing Taxiway G-1. The conventional hangars are proposed as private investments with ground leases maintained with the County.

While not mandatory, automobile access to the eastern terminal area is recommended. Currently, access to the hangars and businesses in the existing eastern terminal or "alert area" is via a secure gate and on the apron. The proposed hangar developments would place a high level of automobile activity on the aircraft movement areas in the eastern terminal. As a result, the proposed plan calls for a new airport entrance/access road to be developed. The new road is proposed to offer ingress/egress directly from Las Posas Road. It should be noted, however, that the intersection with Las Posas Road would allow for right turns in and out only. This will limit high volume activity and not require a new signal light on Las Posas Road.

The vacant area surrounding the fuel farm is also considered for future hangar development. This area could

support low activity uses such as T-hangars. The recommended concept considers the development of five T-hangar facilities in this area. If developed as proposed, Aviation Drive would have to be closed and Convair Street improved so that aircraft based in the T-hangars could access the airfield.

Airport Land Use Compatibility

The recommended master plan concept requires a review by the Ventura County Airport Land Use Commission. If the planned future airport layout and forecast activity levels are significant, the Commission may elect to update the Ventura County Airport Land Use Compatibility Plan (ALUCP) with regard to Camarillo Airport. The current ALUCP was based on a similar concept presented in the previous Airport Master Plan Update. Therefore, only minor changes to the ALUCP would be anticipated.

SUMMARY

The recommended master plan concept has been developed in conjunction with the Planning Advisory Committee, airport management, and numerous City officials. It is designed to assist in making decisions on future development and growth of Camarillo Airport. This plan provides the necessary development to accommodate and satisfy the anticipated growth over the next 20 years and beyond.

The proposed airside improvements will ensure that the airport is capable of meeting future aviation demand. Moreover, the capacity and efficiency improvements will be needed to ensure a safe and efficient facility if operational projections are reached.

On the landside, development opportunities exist on the east end of the airport. These facilities will also be needed to serve future aviation demand. More than half of the development proposed is planned to be constructed by private entities, thereby increasing local economic benefits. In order to effectively and efficiently serve the eastern terminal area, however, a new airport access road would need to be developed.

The next chapter of this master plan will consider strategies for funding the recommended improvements and will provide a reasonable schedule for undertaking the projects based on demand over the course of the next 20 years.

CHAPTER SIX

CAPITAL IMPROVEMENT PROGRAM

CHAPTER SIX

CAPITAL IMPROVEMENT PROGRAM

The analyses completed in previous chapters evaluated development needs at the airport over the next 20 years and beyond, based on forecast activity and operational efficiency. Next, basic economic, financial, and management rationale is applied to each development item so that the feasibility of each item contained in the plan can be assessed.

The presentation of the capital improvement program (CIP) has been organized into two sections. First, the airport development schedule and CIP cost estimate is presented in narrative and graphic form. Second, capital improvement funding sources on the federal, state, and local levels are identified and discussed.

AIRPORT DEVELOPMENT SCHEDULES AND COST SUMMARIES

Now that the recommended concept has been developed and specific needs and improvements for the airport have been established, the next step is to determine a realistic schedule (implementation timeline) and the associated costs for the plan. This section will examine the overall cost of each item in the development plan and present a development schedule. The recommended improvements are grouped by planning horizon: short term, intermediate term, and long term. The short term planning hori-

zon is further subdivided into yearly increments. **Table 6A** summarizes the key milestones for each of the three planning horizons.

TABLE 6A
Planning Horizon Activity Milestones
Camarillo Airport

	Base Year	Short Term	Intermediate Term	Long Term
ANNUAL OPERATIONS				
Itinerant				
Air Taxi	2,249	2,640	3,310	5,130
General Aviation	70,190	88,000	94,000	106,900
Military	101	200	200	200
Total Itinerant	72,540	90,840	97,510	112,230
Local				
General Aviation	66,788	61,200	68,100	84,000
Military	620	500	500	500
Total Local	67,408	61,700	68,600	84,500
TOTAL OPERATIONS	139,948	152,540	166,110	196,730
Annual Instrument Approaches	2,055	2,270	2,440	2,810
BASED AIRCRAFT				
Single Engine	429	456	501	596
Multi-engine	51	51	52	55
Turboprop	11	14	18	24
Jet	22	28	35	45
Helicopter	20	21	24	30
Total Based Aircraft	***533***	***570***	***630***	***750***

A key aspect of this planning document is the use of demand-based planning milestones. The short term planning horizon contains items of highest priority. These items should be considered for development based on actual demand levels within the next five years. As short term horizon activity levels are reached, it will then be time to program for the intermediate term based upon the next activity milestones. Similarly, when the intermediate term milestones are reached, it will be time to program for the long term activity milestones.

Many development items included in the recommended concept will need to follow demand indicators. For example, the plan includes construction of a parallel runway to relieve projected capacity constraints as well as new hangar aprons and taxilanes. Total annual operations will drive capacity constraints and will be the indicator for the need of the parallel runway. If annual aircraft operations remain stagnant or do not reach intermediate and long term projections, a parallel runway may not be needed. Based aircraft will be the indicator for additional hangar needs. If based aircraft

growth occurs as projected, additional hangars should be constructed to meet the demand. Often this potential growth is tracked with a hangar waiting list.

If growth slows or does not occur as forecast, some projects may be delayed. As a result, capital expenditures will be undertaken as needed, which leads to a responsible use of capital assets. If a project is eligible for federal and state funding assistance, it must meet a threshold to where it is justified if grant assistance is requested. In some cases, a benefit-cost analysis is required to determine project justification and eligibility for federal and state grant funds. Again, the justification will be determined by actual demand elements which require the proposed improvements.

Some development items do not depend on demand, such as pavement maintenance projects. These items should be programmed in a timely manner regardless of the forecast growth in activity and are typically associated with day-to-day operations.

As a master plan is a conceptual document, implementation of the capital projects should only be undertaken after further refinement of their design and costs through architectural and engineering analyses. Moreover, some projects may require extensive infrastructure improvements (i.e., drainage improvements, extension of utilities, etc.).

Once the list of necessary projects was identified and refined, project-specific cost estimates were developed. The cost estimates have been increased to allow for contingencies that may arise on the project. Capital costs presented here should be viewed only as estimates subject to further refinement during design. Nevertheless, these estimates are considered sufficient for planning purposes. Cost estimates for each of the development projects in the capital improvement plan are in current (2009) dollars. **Exhibit 6A** presents the proposed capital improvement program for Camarillo Airport.

SHORT TERM IMPROVEMENTS

Projects presented in the short term have been broken out in yearly increments for the period of 2010 to 2014 as presented in **Exhibit 6A**. Each project is also graphically depicted on **Exhibit 6B**.

Many of the projects contained in the short term program involve rehabilitation or improvement of existing facilities. The most significant of these is the rehabilitation of Runway 8-26, both pavement and drainage, as well as the rehabilitation of two ramp areas. Rehabilitation is also planned for Taxiway A hold apron and an apron south of Taxiway G-3.

The short term does include several projects which would add to existing facilities. The most significant new project is the development of a second parallel taxiway to serve airfield operations. As noted in the previous chapters, a second parallel taxiway is desired for efficiency issues. Moreover,

		TOTAL COST	FAA SHARE	STATE SHARE	LOCAL SHARE
	SHORT TERM PROGRAM				
	FY 2010				
1	Acquire Airport Sweeper	$300,000	$285,000	$0	$15,000
	Subtotal FY 2010	*$300,000*	*$285,000*	*$0*	*$15,000*
	FY 2011				
2	Construct Parallel Taxiway @ 700' Separation from Runway (Alpha to Echo)	$4,400,000	$4,180,000	$0	$220,000
3	Construct Northeast Apron (approx. 8,000 sq. yds.)	$2,500,000	$2,375,000	$0	$125,000
	Subtotal FY 2011	*$6,900,000*	*$6,555,000*	*$0*	*$345,000*
	FY 2012				
4	Rehabilitate Apron Pavement (South of G-3)	$1,020,000	$969,000	$24,225	$26,775
5	Upgrade Runway to LED lights	$775,000	$736,250	$18,406	$20,344
	Subtotal FY 2012	*$1,795,000*	*$1,705,250*	*$42,631*	*$47,119*
	FY 2013				
6	Rehabilitate Runway and Exit Taxiway Pavement & Drainage	$1,200,000	$1,140,000	$28,500	$31,500
	Subtotal FY 2013	*$1,200,000*	*$1,140,000*	*$28,500*	*$31,500*
	FY 2014				
7	Rehabilitate Apron South of Taxiway B (20,000 sq. yds.)	$1,120,000	$1,064,000	$26,600	$29,400
	Subtotal FY 2014	*$1,120,000*	*$1,064,000*	*$26,600*	*$29,400*
	SHORT TERM PROGRAM TOTAL	**$11,315,000**	**$10,749,250**	**$97,731**	**$468,019**
	INTERMEDIATE TERM PROGRAM				
1	Install Localizer Antenna	$1,200,000	$1,140,000	$28,500	$31,500
2	Construct 60 Hangars (Mix of Executive and T-Hangars)	$2,600,000	$0	$0	$2,600,000
3	Construct Taxilane for New East Terminal Area T-hangars	$890,000	$845,500	$17,800	$26,700
4	Rehabilitate Pavement West Apron	$1,025,000	$973,750	$24,344	$26,906
5	Rehabilitate Parallel Taxiway G Pavement & Drainage	$1,120,000	$1,064,000	$26,600	$29,400
6	Rehabilitate East Hangar Complex Pavement	$620,000	$589,000	$14,725	$16,275
7	Rehabilitate Pavement & Drainage Taxiways A, C and D; Slurry Seal Runway	$820,000	$779,000	$19,475	$21,525
8	Construct Northeast Terminal Apron and Taxilanes (Approximately 24,500 sq. yds.)	$3,496,000	$3,321,200	$69,920	$104,880
9	Construct 30 T-hangars and 8 Executive Hangars	$1,690,000	$0	$0	$1,690,000
10	Replace PAPI-2 with PAPI-4 Units on Runway 8-26	$90,000	$85,500	$1,800	$2,700
11	Install MALSR - Runway 8	$750,000	$712,500	$15,000	$22,500
	INTERMEDIATE TERM PROGRAM TOTAL	**$15,021,000**	**$10,194,450**	**$235,264**	**$4,591,286**
	LONG TERM PROGRAM				
1	Construct Parallel Taxiway (Alpha to Echo at 400' Separation)	$4,750,000	$4,512,500	$95,000	$142,500
2	Install MALS on Runway 26	$500,000	$475,000	$10,000	$15,000
3	Construct Northeast Terminal Access Road (approx. 1,000')	$422,500	$401,375	$8,450	$12,675
4	Expand East Terminal Apron (approx. 11,100 sq. yds.)	$1,589,000	$1,509,550	$31,780	$47,670
5	Construct Taxilanes for 50 T-hangars	$1,057,000	$1,004,150	$21,140	$31,710
6	Construct 50 T-hangars	$1,950,000	$0	$0	$1,950,000
7	Remove Portions of Existing Taxiways D and E	$101,000	$95,950	$2,020	$3,030
8	Extend Parallel Taxiway F and Reconfigure Taxiway E	$1,490,000	$1,415,500	$29,800	$44,700
9	Upgrade Parallel Taxiway for Use as Parallel Runway (Increase width to 75 feet)	$1,529,000	$1,452,550	$30,580	$45,870
10	Install PAPI-2 on Parallel Runway	$75,000	$71,250	$1,500	$2,250
	LONG TERM PROGRAM TOTAL	**$13,463,500**	**$10,937,825**	**$230,270**	**$2,295,405**
	TOTAL PROGRAM COSTS	**$39,799,500**	**$31,881,525**	**$563,265**	**$7,354,710**

06MP19-6B-12/7/09

LEGEND

- Existing Airport Property Line
- Ultimate Property Line
- Short Term Project Construction

Ventura Freeway
101
Ventura Blvd.
Camarillo Hills Drain
Perimeter Road
Camarillo Center Dr.
RUNWAY 8-26 6,013' x 150'
Las Posas Rd.
Pleasant Valley Road

SHORT TERM PROJECTS

1. Acquire Airport Sweeper (*not pictured*)
2. Construct Parallel Taxiway @ 700' Separation from Runway (Alpha to Echo)
3. Construct Northeast Apron (aprox. 8,000 sq. yds.)
4. Rehabilitate Apron Pavement (South of G-3)
5. Upgrade Runway to LED lights
6. Rehabilitate Runway and Exit Taxiway Pavement and Drainage
7. Rehabilitate Apron South of Taxiway B (20,000 sq. yds.)

NORTH

0 1000 2000

SCALE IN FEET

CAMARILLO AIRPORT

Exhibit 6B
SHORT TERM
DEVELOPMENT STAGING

the existing layout of parallel Taxiway F in proximity to the west terminal apron areas and automobile drive lane creates a taxiway object free area obstruction for aircraft in ARC C/D-III. The proposed taxiway will allow larger aircraft to traverse from the airfield to the east terminal area without having to utilize existing parallel Taxiway F.

The FAA requires that a parallel taxiway to runway separation be at least 400 feet for ARC C/D-II/III aircraft; however, a full length parallel taxiway separated from Runway 8-26 at 400-foot separation cannot be constructed until the terminal VOR is decommissioned and removed. This is not desired by the airport or FAA. As a result, the short term plan includes the development of a full length parallel taxiway located 700 feet south of Runway 8-26 and 300 feet north of existing parallel Taxiway F. In doing so, the VOR can remain operational until removed/replaced by global positioning system (GPS) technology.

The short term plan also includes the widening of Taxiway B pavement fillets so that it can be utilized for "high-speed" exit opportunities. Construction of a new apron in the eastern terminal area is proposed. A localizer antenna designed to provide distance and course information to the aircraft on approach to Runway 26 is also proposed.

The short term CIP totals approximately $11.3 million. Of this total, approximately $10.75 is eligible for FAA grant funding and $97,731 for state funding. The Ventura County Department of Airports would be responsible for the remaining $468,019.

INTERMEDIATE TERM IMPROVEMENTS

Planning new projects beyond a five-year timeframe can be challenging. Project need is heavily dependent upon local demand and the economic outlook of the aviation industry. Therefore, intermediate term projects are grouped together to represent years 6-10. The use of planning horizons to group potential airport projects provides the airport flexibility to accelerate those projects that are needed immediately and delay those projects that no longer have a high priority. The projects are prioritized based on the aviation forecasts, but these priorities may change.

As with the short term, several projects in the intermediate term are rehabilitation of existing facilities. In fact, five projects prioritized in the intermediate term are rehabilitation of airport pavements. This includes pavement and drainage rehabilitation on Taxiways C, D, and G. Apron spaces in the western and eastern terminal areas are also proposed for pavement rehabilitation.

New hangar construction is planned for the intermediate term. The first phase of the plan includes the construction of 60 new hangars with a mix of executive and T-hangars. In support of the hangars, apron and taxilanes are also proposed. It should be noted that the plan considers the county being the developer of the pro-

posed hangars. Hangars are technically eligible for some federal funding; however, they are a low priority project subject only to non-primary entitlement funds ($150,000 per year). As such, the CIP considers all hangar development costs to be entirely local share responsibility.

Several projects involve the addition of new facilities. First, expansion of the eastern terminal apron is proposed. The apron will provide for taxiway access to proposed hangar developments and for aircraft parking. The plan proposes the second phase hanger development of 50 T-hangars (with associated taxilane access) and 8 executive box hangars in the east terminal area as depicted on **Exhibit 6C**.

Finally, airfield navigational improvements are proposed. First, a medium intensity approach lighting system with runway alignment lights (MALSR) is proposed for installation on Runway 26. The plan also proposes an upgrade to a four-box precision approach path indicator (PAPI-4) to replace the existing two-box systems now on both ends of the runway. These navigational aid improvements are designed to improve approach minimums to Runway 26 and improve visual recognition of the runway ends.

The total cost of the intermediate term projects is $15.0 million. Of this total, $10.2 million is eligible for FAA grant funding. Approximately $235,264 is eligible for state grant matching funds, and the remaining $4.6 million would be the responsibility of the county.

LONG TERM IMPROVEMENTS

The long term program focuses on facility improvements necessary to meet aviation demand projections. By this time, based aircraft demands will create hangar needs and annual operations could create congestion and significant delay.

The first project considered in the long term program depicted on **Exhibit 6D** is the extension of the parallel taxiway from Taxiway B to E at 400-foot separation from Runway 8-26. It is believed that the VOR could be decommissioned by this time allowing for the parallel runway to be extended. The second project considered is the installation of an MALS on Runway 8 which, coupled with an LPV GPS approach, could allow Runway 8 to provide approach minimums as low as 0.75 mile visibility.

Long term planning includes the development of 50 T-hangars in the central terminal area. The hangars would be developed adjacent to the existing fuel farm. T-hangar taxilanes would need to be constructed for access. Moreover, a portion of Aviation Drive would need to be closed so that the hangar area could be connected with existing landside facilities. Convair Street would allow for automobile access to connect the western terminal with the central terminal area. Also, a new road is proposed in the eastern terminal area. The proposed road would offer ingress/egress from Las Posas Road. It should be noted, however, that the intersection with Las Posas Road would allow for right turns in and out only. This will

06MP19-6C-12/7/09

LEGEND

- Existing Airport Property Line
- Ultimate Property Line
- Intermediate Term Project Construction

Ventura Freeway
101
Ventura Blvd.
Camarillo Hills Drain
Perimeter Road
Camarillo Center Dr.
Las Posas Rd.
Pleasant Valley Road
RUNWAY 8-26 6,013' x 150'

INTERMEDIATE TERM PROJECTS

1. Install Localizer Antenna
2. Construct 60 Hangars (Mix of Executive and T-Hangars)
3. Construct Taxilane for Northeast Terminal Area T-hangars
4. Rehabilitate Pavement West Apron
5. Rehabilitate Parallel Taxiway G Pavement & Drainage
6. Rehabilitate East Hangar Complex Pavement
7. Rehabilitate Pavement & Drainage Taxiways A, C and D; Slurry Seal Runway
8. Construct New East Terminal Apron and Taxilanes (Appoximately 24,500 sq. yds.)
9. Construct 30 T-hangars and 8 Executive Hangars
10. Replace PAPI-2 with PAPI-4 Units on Runway 8-26
11. Install MALSR - Runway 8

NORTH

0 1000 2000

SCALE IN FEET

CAMARILLO AIRPORT

Exhibit 6C
INTERMEDIATE TERM
DEVELOPMENT STAGING

06MP19-6D-5/29/09

LEGEND

- Existing Airport Property Line
- Ultimate Property Line
- Long Term Project Construction
- Pavement to be Removed

Ventura Freeway
101
Ventura Blvd.
Camarillo Hills Drain
Perimeter Road
RUNWAY 8-26 6,013' x 150'
Camarillo Center Dr.
Las Posas Rd.
Pleasant Valley Road
NORTH
0
1000
2000
SCALE IN FEET

LONG TERM PROJECTS

1. Construct Parallel Taxiway (Alpha to Echo at 400' Separation)
2. Install MALS on Runway 26
3. Construct Northeast Terminal Access Road (approx. 1,0 00')
4. Expand East Terminal Apron (approx. 11,100 yds^2)
5. Construct Taxilanes for 50 Thangars
6. Construct 50 T-hangars
7. Remove Portions of Existing Taxiways D and E
8. Extend Parallel Taxiway F and Reconfigure Taxiway E
9. Upgrade Parallel Taxiway for Use as Parallel Runway (Increase width to 75')
10. Install PAPI-2 on Parallel Runway

CAMARILLO AIRPORT

Exhibit 6D
LONG TERM
DEVELOPMENT STAGING

limit high volume activity and not require a new signal light on Las Posas Road.

The final projects considered in the long term involve those necessary to transition the portion of the short term parallel taxiway to be a commissioned parallel runway. The pavement will need to be increased in width from 50 feet (taxiway) to 75 feet. Portions of existing Taxiways B, D, and E will have to be removed. Taxiway F is proposed to be extended so as to become a right-angled alignment with Taxiway E and Runway 8. Finally, the installation of a PAPI-2 on both ends of the parallel runway are proposed.

The long term projects total $13.5 million. The county would be responsible for $2.3 million of this, while federal and state grants would be eligible for the remaining $10.94 million.

The 20-year investment total is approximately $39.8 million, with $7.35 million of that total being the responsibility of the county.

CAPITAL IMPROVEMENT FUNDING SOURCES

Financing capital improvements at the airport will not rely solely on the financial resources of the airport or the county. Capital improvement funding is available through various grant-in-aid programs on both the state and federal levels. The following discussion outlines key sources of funding potentially available for capital improvements at Camarillo Airport.

FEDERAL GRANTS

Through federal legislation over the years, various grant-in-aid programs have been established to develop and maintain a system of public airports across the United States. The purpose of this system and its federally based funding is to maintain national defense and to promote interstate commerce. The most recent legislation affecting federal funding was enacted in late 2003 and is titled, *Century of Aviation Re-authorization Act,* or Vision 100.

The four-year bill covered FAA fiscal years 2004, 2005, 2006, and 2007. This bill presented similar funding levels to the previous bill - *Air 21.* Airport Improvement Program (AIP) funding was authorized at $3.4 billion in 2004, $3.5 billion in 2005, $3.6 billion in 2006, and $3.7 billion in 2007. This bill provided the FAA with the opportunity to plan for longer term projects versus one-year re-authorizations. As of spring 2009, a new multi-year bill has not been passed, but several continuing resolutions have maintained funding for priority airport projects.

The source for AIP funds is the Aviation Trust Fund. The Aviation Trust Fund was established in 1970 to provide funding for aviation capital investment programs (aviation development, facilities and equipment, and research and development). The Aviation Trust Fund also finances the op-

eration of the FAA. It is funded by user fees, including taxes on airline tickets, aviation fuel, and various aircraft parts. The Trust Fund is also up for re-authorization.

Funds are distributed each year by the FAA from appropriations by Congress. A portion of the annual distribution is to primary commercial service airports based upon enplanement levels. Congress appropriated the full amounts authorized by *Vision 100*, allowing eligible general aviation airports to receive up to $150,000 of funding each year in Non-Primary Entitlement (NPE) funds (NPIAS inclusion is required for general aviation entitlement funding). Camarillo Airport qualifies for full NPE funding as the NPIAS includes over $150,000 in yearly capital projects.

The remaining AIP funds are distributed by the FAA based on the priority of the projects for which they have requested federal assistance through discretionary apportionments. A national priority ranking system is used to evaluate and rank each airport project. Those projects with the highest priority from airports across the country are given preference in funding.

Under the AIP program, examples of eligible development projects include the airfield, public aprons, and access roads. Additional buildings and structures may be eligible if the function of the structure is to serve airport operations in a non-revenue generating capacity such as maintenance facilities. Some revenue enhancing structures, such as T-hangars, may be eligible if all airfield improvements have been made but the priority ranking of these facilities is very low.

Whereas entitlement monies are guaranteed on an annual basis, discretionary funds are not assured. If the combination of entitlement, discretionary, and airport sponsor match does not provide enough capital for planned development, projects may be delayed. Other supplemental funding sources are described in the following subsections.

STATE AID TO AIRPORTS

All state grant programs for airports are funded from the Aeronautics Account in the California State Transportation Fund. Tax revenues, which are collected on general aviation fuel, are deposited in the Aeronautics Account. General aviation jet fuel is taxed at $.02 per gallon, and Avgas is taxed at $.18 per gallon. These taxes generate approximately $7 million per year. The Revenue and Taxation Code spells out the priority for expenditure of funds: 1) administration and collection of taxes; 2) operations of Division of Aeronautics; and 3) grants to airports. The Public Utilities Code further specifies the priority for allocation of Aeronautics Account funds to airports: 1) Annual Grants; 2) AIP Matching; and 3) Acquisition and Development (A&D) Grants.

Annual Grants

To receive an Annual Grant, the airport cannot be designated by the FAA

as a reliever or commercial service airport. The Annual Grant can fund projects for "airport and aviation purposes" as defined in the *State Aeronautics Act*. It can also be used to fund fueling facilities, restrooms, showers, wash racks, and operations and maintenance. The annual funding level is $10,000; up to five years' worth of Annual Grants may be accrued at the sponsor's discretion. No local match is required. Camarillo Airport is not eligible for Annual Grants as it is a reliever general aviation airport.

AIP Matching Grants

An FAA AIP grant can be matched with state funds; the current matching rate is 2.5 percent. Generally, state matching is limited to projects that primarily benefit general aviation. A project which is being funded by an AIP grant must be included in the capital improvement program (CIP). The amount set aside for AIP matching is determined by the California Transportation Commission (CTC) each fiscal year. Unused set-aside funds are available for additional A&D Grants.

Acquisition and Development (A&D) Grants

This grant program is open to general aviation, reliever, and commercial service airports. Also, a city or county may receive grants on behalf of a privately owned, public-use airport. An airport land use commission (ALUC) can receive funding to either prepare or update a comprehensive land use plan (CLUP). An A&D grant can fund projects for "airport and aviation purposes" as defined in the *State Aeronautics Act*. An A&D grant cannot be used as a local match for an AIP grant. The minimum amount of an A&D grant is $10,000, while the maximum amount that can be allocated to an airport in a single fiscal year is $500,000 (single or multiple grants). The local match can vary from 10 to 50 percent of the project's cost and is set annually by the CTC. A 10 percent rate has been used the past 15 years. The Annual Grant may not be used for the local match to an A&D grant.

Local Airport Loan Program

Eligible airports, including Camarillo Airport, can obtain low interest loans for airport development projects, the local matching portion of an AIP grant, and revenue-generating projects such as fuel farms and hangars. Land banking, airport access roads, parking lots, and airline facilities are not eligible under the loan program. Currently, there is no limit on the size of the loans except the availability of funds.

FINANCING OF DEVELOPMENT PROGRAM

Earlier in this chapter, programmed expenditures were presented in current (2009) dollars. Future expenditures were categorized according to assigned financing responsibilities, with the airport's responsible expenditures the primary focus of these feasibility analyses. In this section, the

base costs assumed to be the financing responsibility of the airport are adjusted to reflect available funds to determine the projected local share of these proposed capital expenditures in current dollars. Financing assumptions are then made, and the projected annual airport cost of these planned expenditures is estimated for incorporation into the cash flow analysis.

At the outset, it must be emphasized that long term feasibility analyses such as these must be based on many assumptions. In practice, projects will be undertaken when demand actually warrants, thus changing underlying assumptions. Further, the actual financing of capital expenditures will be a function of airport circumstances at the time of project implementation (i.e., revenue bond financing would likely not be used unless the actual level of airport earnings and reserves, along with entitlement and discretionary grants available at a particular time, were insufficient to meet project costs). As a result, the assumptions and analyses prepared for the master plan must be viewed in the context of their primary purpose: to examine whether there is a reasonable expectation that recommended improvements will be financially feasible and implementable.

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

The airport is owned by Ventura County and operated through the collection of various rates and charges from general aviation and other non-aviation revenue sources. Most revenues are generated specifically by airport operations, although the airport does support non-aviation business uses which also generate revenues. It should be noted that there are restrictions on the use of revenues collected by the airport. All receipts, excluding bond proceeds or related grants and interest, are irrevocably pledged to the punctual payment of operating and maintenance expenses, payment of debt service for as long as bonds remain outstanding, or to additions or improvements to airport facilities. **Table 6B** presents historical expenses and revenues for Camarillo Airport.

OPERATING REVENUES

Operating revenues at Camarillo Airport are generated by a variety of sources ranging from FBO leases, hangar rents, fuel flowage fees, concessions, and ground leases. As shown in **Table 6B**, these revenues have been both higher and lower than overall operating expenses.

The largest revenue center for the airport is for rents, leases, and concessions. This grouping includes monthly rentals of county-owned hangars, land leases for private hangar developments including FBO facilities, concessions to businesses such as the restaurant, and non-aviation related land

leases and office space rent. In fact, this revenue source grouping accounts for approximately 90 percent of the airport's annual operating revenues.

TABLE 6B
Historical Operating Revenues and Expenses
Camarillo Airport

	2004	2005	2006	2007	2008
OPERATING REVENUES					
Rents, Leases, & Concessions	$2,567,200	$2,092,100	$3,095,300	$3,139,300	$3,190,000
Apron Tiedown Rents/Fees	86,100	65,700	93,700	99,600	95,000
Fuel and Oil Flowage Fees	147,000	140,300	162,300	163,200	168,100
Landing Fees	29,200	25,500	33,600	41,800	40,700
Miscellaneous	174,200	149,000	347,200	121,600	76,100
TOTAL OPERATING REVENUES	$3,003,700	$2,472,600	$3,732,100	$3,565,500	$3,569,900
OPERATING EXPENSES					
Personnel Services	$1,184,800	$960,600	$1,557,000	$1,650,600	$1,691,100
Maintenance	104,400	73,700	154,000	95,200	150,400
Household Expense	21,400	13,200	28,700	26,800	24,200
Insurance	57,900	40,000	36,400	35,300	26,200
Professional Advancement	19,900	15,200	46,100	41,300	52,200
Office and Equipment	68,000	56,100	74,300	82,300	66,800
Miscellaneous	63,300	61,400	208,200	186,500	128,100
Professional and Specialized Services	154,100	81,100	116,300	118,100	160,400
Transportation Charges	51,700	43,800	58,700	52,300	46,400
Indirect County Costs	90,400	79,300	123,200	122,700	110,500
Utilities and Communication	184,000	129,600	193,000	198,200	201,900
Depreciation	936,500	617,800	1,023,300	1,130,100	1,257,400
OPERATING EXPENSES	$2,936,400	$2,171,800	$3,619,200	$3,739,400	$3,915,600
OPERATING INCOME/LOSS	$67,300	$300,800	$112,900	-$173,900	-$345,700

The rates associated with these revenue sources can vary based on several factors. For example, rents collected for county-owned storage hangar facilities vary based on square-footage and whether the facility has electrical service provided. County-owned storage hangar rates are based on $0.244 per square foot per month without electrical service and $0.248 per square foot per month with electrical service. Ground lease rates for private storage hangars are $0.091 per square foot per month without electrical service and $0.094 per square foot per month if the site is provided electricity.

Land lease rates for aviation and non-aviation development varies based on the valuation of improvements. Currently, the airport charges a minimum of ten percent of the fair market value and/or appraised value of land per annum or as otherwise approved by the County Board of Supervisors. Businesses are also subject to an applicable rate of all gross receipts.

Other revenue sources include those generated by aircraft parking, landing fees, and fuel sales/storage. Overnight tie-down apron rates vary based on aircraft type: $7 for single engine aircraft; $9 for multi-engine aircraft under 12,500 pounds; and an adjusting scale of $20 to $60 per night for aircraft weighing between 12,500 and 60,000 pounds. Monthly tie-down rates range from $73 per month for small aircraft to $600 per month for aircraft weighing between 50,000 and 60,000 pounds.

Landing fees are charged to air carrier and air taxi operators at a rate of a minimum $7 or one dollar per 1,000 pounds of gross weights, whichever is higher. Fuel flowage fees are charged to the aviation fuel retailer at $0.05 per gallon delivered to the fuel storage facility. For vendors storing fuel in county-owned fuel storage facilities, an additional fee of $0.046 per gallon delivered is charged to the vendor.

A review of the current rates and charges confirms that the existing rate/fee schedule is in line with regional and industry airports. It is important to note that the airport leases and rents are established to allow for appropriate changes including fair market value and CPI indexing.

OPERATING EXPENSES

Generalized operating expenses for Camarillo Airport include personnel services, benefits, maintenance, utilities/communication, insurance, office and equipment, and depreciation. As indicated in **Table 6B**, airport operating expenditures have generally increased over the previous five years. In fact, operating expenditures have outpaced revenues for the last two years.

Personnel services have been, and will continue to be, the single largest cost center for the airport. This is very common for general aviation airports, especially large reliever airports. These types of airports commonly have substantial facilities which require a relatively large staff to oversee day-to-day operations. Nearly as large, depreciation expenses have also

experienced a significant increase over the last five years.

It is evident from the table that the airport has maintained a negative operational income over the last two years. Moreover, given the nature of the economy, continued losses are likely for the short term. General aviation, as a whole, generally follows regional and national economic trends. It should be noted, however, that airports similar to CMA do not typically maintain a positive operating income as expenses generally exceed revenues, at least in most years. Based on previous years, however, it is clear that operational revenues can be sufficient to generate an operational surplus.

FUTURE CASH FLOW

Table 6C presents a generalized projection of future operating revenues and expenditures. It should be noted that the information presented in the table is the average annual revenue and expense for each planning horizon. In an analysis such as this, wide generalizations must be made. Some specifics can be inserted that are directly associated with future development plans. An example is hangar development.

The intermediate and long term CIP includes county-sponsored hangar development. Obviously, these hangars will generate additional hangar rents. If the county decides to construct new hangars, the hangar rents will need to be established in such a manner that the county will be capable of amortizing its development costs over a reasonable time period. Obviously, if the county does not fund the construction of these facilities, costs of developing the new hangars will be significantly lower than if they paid for construction. If the county does not construct any of the proposed hangar facilities, the county's only capital cost would be 2.5 percent of the apron or taxilane construction (the remaining 97.5 percent could come from federal and state grants). Privately owned facilities offer the county significant savings and would not require debt service to repay construction costs.

Forecasts presented earlier indicate operational increases. Operational increases will generate additional income for fuel flowage, tie-down, and landing fees. Obviously, operational increases will also influence greater revenue in concessions and hangar rents/land leases.

Future expenses will vary depending upon the county's desire to construct additional hangars and associated costs of maintaining existing hangars and landside pavements (local share). Future expenses, however, could be severely higher if additional bonding or loans are obtained for hangar construction. If the county decides to construct additional hangars, it is likely that bonding or loans for the construction of these facilities would be necessary. Also, the county could expect maintenance costs and administrative costs associated with operating hangar facilities.

It should be noted that proposed capital improvements could, at times, ex-

ceed the county's ability to fund from operating revenues. Thus, debt service may be necessary unless additional funding is provided from the county. Each project will require critical examination to determine the feasibility and funding (local) availability. The county will need to determine at the time if funding assistance is available for critical projects not capable of being funded by operational revenues.

TABLE 6C
Average Annual Operating Revenue & Expense Projections

	Short Term	Intermediate Term	Long Term
OPERATING REVENUES			
Rents, Land Leases, & Concessions	$3,573,800	$4,232,100	$5,419,100
Apron Tiedown Rents/Fees	102,400	115,800	139,600
Fuel and Oil Flowage Fees	189,400	230,400	310,700
Landing fees	47,200	60,300	87,600
Miscellaneous	127,400	140,700	163,400
TOTAL OPERATING REVENUES	*$4,040,200*	*$4,779,300*	*$6,120,400*
OPERATING EXPENSES			
Personnel Services	$1,849,500	$2,144,100	$2,683,600
Maintenance	157,300	169,500	189,600
Household Expense	25,700	28,400	32,900
Insurance	27,000	28,400	30,600
Professional Advancement	57,100	66,200	82,800
Office and Equipment	70,900	78,300	90,900
Miscellaneous	134,000	144,300	161,500
Professional and Specialized Services	165,300	173,700	187,200
Transportation Charges	50,000	56,600	68,200
Indirect County Costs	119,100	134,700	162,400
Utilities and Communication	220,800	256,000	320,400
Depreciation	1,334,900	1,473,800	1,711,900
OPERATING EXPENSES	*$4,211,600*	*$4,754,000*	*$5,722,000*
OPERATING INCOME/LOSS	***-$171,400***	***$25,300***	***$398,400***

SUMMARY

The best means to begin implementation of the recommendations in this master plan is to first recognize that planning is a continuous process that does not end with completion and approval of this document. Rather, the ability to continuously monitor the existing and forecast status of airport activity must be provided and maintained. The issues upon which this master plan is based will remain valid for a number of years. The primary goal is for the airport to best serve the air transportation needs of the region, while continuing to be economically self-sufficient.

The actual need for facilities is most appropriately established by airport activity levels rather than a specified date. For example, projections have been made as to when additional hangars may be needed at the airport. In reality, however, the timeframe in which the development is needed may be substantially different. Actual demand may be slower to develop than expected. On the other hand, high levels of demand may establish the need to accelerate the development. Although every effort has been made in this master planning process to conservatively estimate when facility development may be needed, aviation demand will dictate when facility improvements need to be delayed or accelerated.

The real value of a usable master plan is in keeping the issues and objectives in the minds of the managers and decision-makers so that they are better able to recognize change and its effect. In addition to adjustments in aviation demand, decisions made as to when to undertake the improvements recommended in this master plan will impact the period that the plan remains valid. The format used in this plan is intended to reduce the need for formal and costly updates by simply adjusting the timing. Updating can be done by the manager, thereby improving the plan's effectiveness.

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

APPENDIX A

GLOSSARY OF TERMS

Glossary of Terms

A

ABOVE GROUND LEVEL: The elevation of a point or surface above the ground.

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

ADVISORY CIRCULAR: External publications issued by the FAA consisting of nonregulatory material providing for the recommendations relative to a policy, guidance and information relative to a specific aviation subject.

AIR CARRIER: An operator which: (1) performs at least five round trips per week between two or more points and publishes flight schedules which specify the times, days of the week, and places between which such flights are performed; or (2) transports 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.

AIRCRAFT: A transportation vehicle that is used or intended for use for flight.

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

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

AIRCRAFT OPERATION: The landing, takeoff, or touch-and-go procedure by an aircraft on a runway at an airport.

AIRCRAFT OPERATIONS AREA (AOA): A restricted and secure area on the airport property designed to protect all aspects related to aircraft operations.

AIRCRAFT OWNERS AND PILOTS ASSOCIATION: A private organization serving the interests and needs of general aviation pilots and aircraft owners.

AIRCRAFT RESCUE AND FIRE FIGHTING: A facility located at an airport that provides emergency vehicles, extinguishing agents, and personnel responsible for minimizing the impacts of an aircraft accident or incident.

AIRFIELD: The portion of an airport which contains the facilities necessary for the operation of aircraft.

AIRLINE HUB: An airport at which an airline concentrates a significant portion of its activity and which often has a significant amount of connecting traffic.

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

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

AIRPORT AUTHORITY: A quasi-governmental public organization responsible for setting the policies governing the management and operation of an airport or system of airports under its jurisdiction.

AIRPORT BEACON: A navigational aid located at an airport which displays a rotating light beam to identify whether an airport is lighted.

AIRPORT CAPITAL IMPROVEMENT PLAN: The planning program used by the Federal Aviation Administration to identify, prioritize, and distribute funds for airport development and the needs of the National Airspace System to meet specified national goals and objectives.

AIRPORT ELEVATION: The highest point on the runway system at an airport expressed in feet above mean sea level (MSL).

AIRPORT IMPROVEMENT PROGRAM: A program authorized by the Airport and Airway

Improvement Act of 1982 that provides funding for airport planning and development.

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

AIRPORT LAYOUT PLAN (ALP): A scaled drawing of the existing and planned land and facilities necessary for the operation and development of the airport.

AIRPORT LAYOUT PLAN DRAWING SET: A set of technical drawings depicting the current and future airport conditions. The individual sheets comprising the set can vary with the complexities of the airport, but the FAA-required drawings include the Airport Layout Plan (sometimes referred to as the Airport Layout Drawing (ALD), the Airport Airspace Drawing, and the Inner Portion of the Approach Surface Drawing, On-Airport Land Use Drawing, and Property Map.

AIRPORT MASTER PLAN: The planner's concept of the long-term development of an airport.

AIRPORT MOVEMENT AREA SAFETY SYSTEM: A system that provides automated alerts and warnings of potential runway incursions or other hazardous aircraft movement events.

AIRPORT OBSTRUCTION CHART: A scaled drawing depicting the Federal Aviation Regulation (FAR) Part 77 surfaces, a representation of objects that penetrate these surfaces, runway, taxiway, and ramp areas, navigational aids, buildings, roads and other detail in the vicinity of an airport.

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

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

AIRPORT SPONSOR: The entity that is legally responsible for the management and operation of an airport, including the fulfillment of the requirements of laws and regulations related thereto.

AIRPORT SURFACE DETECTION EQUIPMENT: A radar system that provides air traffic controllers with a visual representation of the movement of aircraft and other vehicles on the ground on the airfield at an airport.

AIRPORT SURVEILLANCE RADAR: The primary radar located at an airport or in an air traffic control terminal area that receives a signal at an antenna and transmits the signal to air traffic control display equipment defining the location of aircraft in the air. The signal provides only the azimuth and range of aircraft from the location of the antenna.

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

AIR ROUTE TRAFFIC CONTROL CENTER: A facility which provides en route air traffic control service to aircraft operating on an IFR flight plan within controlled airspace over a large, multi-state region.

AIRSIDE: The portion of an airport that contains the facilities necessary for the operation of aircraft.

AIRSPACE: The volume of space above the surface of the ground that is provided for the operation of aircraft.

AIR TAXI: An air carrier certificated in accordance with FAR Part 121 and FAR Part 135 and authorized to provide, on demand, public transportation of persons and property by aircraft. Generally operates small aircraft "for hire" for specific trips.

AIR TRAFFIC CONTROL: A service operated by an appropriate organization for the purpose of providing for the safe, orderly, and expeditious flow of 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 en route phase of flight.

AIR TRAFFIC CONTROL SYSTEM COMMAND CENTER: A facility operated by the FAA which is responsible for the central flow control, the central altitude reservation system, the airport reservation position system, and the air traffic service contingency command for the air traffic control system.

AIR TRAFFIC HUB: A categorization of commercial service airports or group of commercial service airports in a metropolitan or urban area based upon the proportion of annual national enplanements existing at the airport or airports. The categories are large hub, medium hub, small hub, or non-hub. It forms the basis for the apportionment of entitlement funds.

AIR TRANSPORT ASSOCIATION OF AMERICA: An organization consisting of the principal U.S. airlines that represents the interests of the airline industry on major aviation issues before federal, state, and local government bodies. It promotes air transportation safety by coordinating industry and governmental safety programs and it serves as a focal point for industry efforts to standardize practices and enhance the efficiency of the air transportation system.

ALERT AREA: See special-use airspace.

ALTITUDE: The vertical distance measured in feet above mean sea level.

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

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

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

APPROACH SURFACE: An imaginary obstruction limiting surface defined in FAR Part 77 which is longitudinally centered on an extended runway centerline and extends outward and upward from the primary surface at each end of a runway at a designated slope and distance based upon the type of available or planned approach by aircraft to a runway.

APRON: A specified portion of the airfield used for passenger, cargo or freight loading and unloading, aircraft parking, and the refueling, maintenance and servicing of aircraft.

AREA NAVIGATION: The air navigation procedure that provides the capability to establish and maintain a flight path on an arbitrary course that remains within the coverage area of navigational sources being used.

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

AUTOMATED SURFACE OBSERVATION SYSTEM (ASOS): A reporting system that provides frequent airport ground surface weather observation data through digitized voice broadcasts and printed reports.

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

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

AVIGATION EASEMENT: A contractual right or a property interest in land over which a right of unobstructed flight in the airspace is established.

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

B

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

BASED AIRCRAFT: The general aviation aircraft that use a specific airport as a home base.

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

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

BLAST PAD: A prepared surface adjacent to the end of a runway for the purpose of eliminating the erosion of the ground surface by the wind forces produced by airplanes at the initiation of takeoff operations.

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

C

CAPITAL IMPROVEMENT PLAN: The planning program used by the Federal Aviation Administration to identify, prioritize, and distribute Airport Improvement Program funds for airport development and the needs of the National Airspace System to meet specified national goals and objectives.

CARGO SERVICE AIRPORT: An airport served by aircraft providing air transportation of property only, including mail, with an annual aggregate landed weight of at least 100,000,000 pounds.

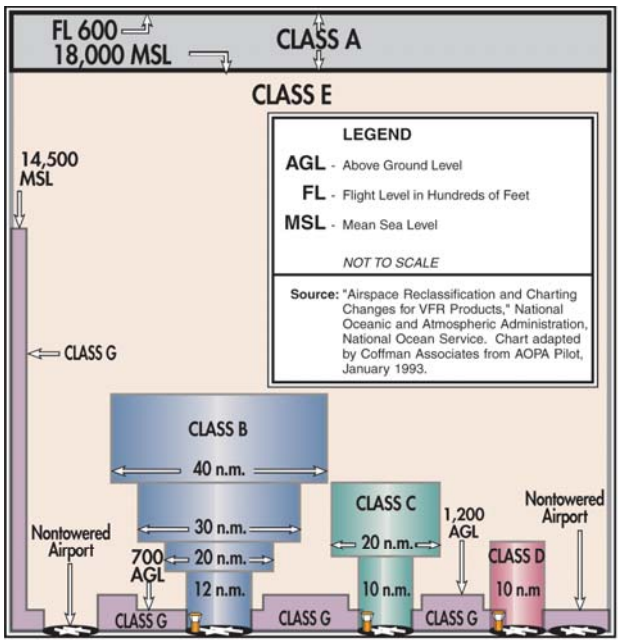
CATEGORY I: An Instrument Landing System (ILS) that provides acceptable guidance information to an aircraft from the coverage limits of the ILS to the point at which the localizer course line intersects the glide path at a decision height of 100 feet above the horizontal plane containing the runway threshold.

CATEGORY II: An ILS that provides acceptable guidance information to an aircraft from the coverage limits of the ILS to the point at which the localizer course line intersects the glide path at a decision height of 50 feet above the horizontal plane containing the runway threshold.

CATEGORY III: An ILS that provides acceptable guidance information to a pilot from the coverage limits of the ILS with no decision height specified above the horizontal plane containing the runway threshold.

CEILING: The height above the ground surface to the location of the lowest layer of clouds which is reported as either broken or overcast.

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



CLASS A AIRSPACE: See Controlled Airspace.

CLASS B AIRSPACE: See Controlled Airspace.

CLASS C AIRSPACE: See Controlled Airspace.

CLASS D AIRSPACE: See Controlled Airspace.

CLASS E AIRSPACE: See Controlled Airspace.

CLASS G AIRSPACE: See Controlled Airspace.

CLEAR ZONE: See Runway Protection Zone.

COMMERCIAL SERVICE AIRPORT: A public airport providing scheduled passenger service that enplanes at least 2,500 annual passengers.

COMMON TRAFFIC ADVISORY FREQUENCY: A radio frequency identified in the appropriate aeronautical chart which is designated for the purpose of transmitting airport advisory information and procedures while operating to or from an uncontrolled airport.

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

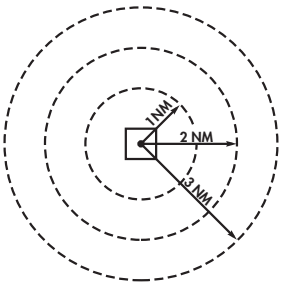
CONICAL SURFACE: An imaginary obstruction-limiting surface defined in FAR Part 77 that extends from the edge of the horizontal surface outward and upward at a slope of 20 to 1 for a horizontal distance of 4,000 feet.

CONTROLLED AIRPORT: An airport that has an operating airport traffic control tower.

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

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

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



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

- **CLASS D**: Generally, that airspace from the surface to 2,500 feet above the air port elevation (charted as MSL) surrounding those airports that have an operational control tower. Class D airspace is individually tailored and configured to encompass published instrument approach procedure . Unless otherwise authorized, all persons must establish two-way radio communication.

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

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

CONTROLLED FIRING AREA: See special-use airspace.

CROSSWIND: A wind that is not parallel to a runway centerline or to the intended flight path of an aircraft.

CROSSWIND COMPONENT: The component of wind that is at a right angle to the runway centerline or the intended flight path of an aircraft.

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

D

DECIBEL: A unit of noise representing a level relative to a reference of a sound pressure 20 micro newtons per square meter.

DECISION HEIGHT: The height above the end of the runway surface at which a decision must be made by a pilot during the ILS or Precision Approach Radar approach to either continue the approach or to execute a missed approach.

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

- **TAKEOFF RUNWAY AVAILABLE (TORA)**: The runway length declared available and suitable for the ground run of an airplane taking off.
- **TAKEOFF DISTANCE AVAILABLE (TODA)**: The TORA plus the length of any remaining runway and/or clear way beyond the far end of the TORA.
- **ACCELERATE-STOP DISTANCE AVAILABLE (ASDA)**: The runway plus stopway length declared available for the acceleration and deceleration of an aircraft aborting a takeoff.
- **LANDING DISTANCE AVAILABLE (LDA)**: The runway length declared available and suitable for landing.

DEPARTMENT OF TRANSPORTATION: The cabinet level federal government organization consisting of modal operating agencies, such as the Federal Aviation Administration, which was established to promote the coordination of federal transportation programs and to act as a focal point for research and development efforts in transportation.

DISCRETIONARY FUNDS: Federal grant funds that may be appropriated to an airport based upon designation by the Secretary of Transportation or Congress to meet a specified national priority such as enhancing capacity, safety, and security, or mitigating noise.

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

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

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

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

E

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

ELEVATION: The vertical distance measured in feet above mean sea level.

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

ENPLANEMENT: The boarding of a passenger, cargo, freight, or mail on an aircraft at an airport.

ENTITLEMENT: Federal funds for which a commercial service airport may be eligible based upon its annual passenger enplanements.

ENVIRONMENTAL ASSESSMENT (EA): An environmental analysis performed pursuant to the National Environmental Policy Act to determine whether an action would significantly affect the environment and thus require a more detailed environmental impact statement.

ENVIRONMENTAL AUDIT: An assessment of the current status of a party's compliance with applicable

environmental requirements of a party's environmental compliance policies, practices, and controls.

ENVIRONMENTAL IMPACT STATEMENT (EIS): A document required of federal agencies by the National Environmental Policy Act for major projects are legislative proposals affecting the environment. It is a tool for decision-making describing the positive and negative effects of a proposed action and citing alternative actions.

ESSENTIAL AIR SERVICE: A federal program which guarantees air carrier service to selected small cities by providing subsidies as needed to prevent these cities from such service.

F

FEDERAL AVIATION REGULATIONS: The general and permanent rules established by the executive departments and agencies of the Federal Government for aviation, which are published in the Federal Register. These are the aviation subset of the Code of Federal Regulations.

FEDERAL INSPECTION SERVICES: The provision of customs and immigration services including passport inspection, inspection of baggage, the collection of duties on certain imported items, and the inspections for agricultural products, illegal drugs, or other restricted items.

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

FINAL APPROACH AND TAKEOFF AREA (FATO). A defined area over which the final phase of the helicopter approach to a hover, or a landing is completed and from which the takeoff is initiated.

FINAL APPROACH FIX: The designated point at which the final approach segment for an aircraft landing on a runway begins for a non-precision approach.

FINDING OF NO SIGNIFICANT IMPACT (FONSI): A public document prepared by a Federal agency that presents the rationale why a proposed action will not have a significant effect on the environment and for which an environmental impact statement will not be prepared.

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

FLIGHT LEVEL: A designation for altitude within controlled airspace.

FLIGHT SERVICE STATION: An operations facility in the national flight advisory system which utilizes data interchange facilities for the collection and dissemination of Notices to Airmen, weather, and administrative data and which provides pre-flight and in-flight advisory services to pilots through air and ground based communication facilities.

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

G

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

GENERAL AVIATION AIRPORT: An airport that provides air service to only general aviation.

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

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

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

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

GROUND ACCESS: The transportation system on and around the airport that provides access to and

from the airport by ground transportation vehicles for passengers, employees, cargo, freight, and airport services.

H

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

HIGH INTENSITY RUNWAY LIGHTS: The highest classification in terms of intensity or brightness for lights designated for use in delineating the sides of a runway.

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

HORIZONTAL SURFACE: An imaginary obstruction- limiting surface defined in FAR Part 77 that is specified as a portion of a horizontal plane surrounding a runway located 150 feet above the established airport elevation. The specific horizontal dimensions of this surface are a function of the types of approaches existing or planned for the runway.

I

INITIAL APPROACH FIX: The designated point at which the initial approach segment begins for an instrument approach to a runway.

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

INSTRUMENT FLIGHT RULES (IFR): Procedures for the conduct of flight in weather conditions below Visual Flight Rules weather minimums. The term IFR is often also used to define weather conditions and the type of flight plan under which an aircraft is operating.

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

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

INSTRUMENT METEOROLOGICAL CONDITIONS: Meteorological conditions expressed in terms of specific visibility and ceiling conditions that are less than the minimums specified for visual meteorological conditions.

ITINERANT OPERATIONS: Operations by aircraft that are not based at a specified airport.

K

KNOTS: A unit of speed length used in navigation that is equivalent to the number of nautical miles traveled in one hour.

L

LANDSIDE: The portion of an airport that provides the facilities necessary for the processing of passengers, cargo, freight, and ground transportation vehicles.

LANDING DISTANCE AVAILABLE (LDA): See declared distances.

LARGE AIRPLANE: An airplane that has a maximum certified takeoff weight in excess of 12,500 pounds.

LOCAL AREA AUGMENTATION SYSTEM: A differential GPS system that provides localized measurement correction signals to the basic GPS signals to improve navigational accuracy integrity, continuity, and availability.

LOCAL OPERATIONS: Aircraft operations performed by aircraft that are based at the airport and that operate in the local traffic pattern or within sight of the airport, that are known to be departing for or arriving from flights in local practice areas within a prescribed distance from the airport, or that execute simulated instrument approaches at the airport.

LOCAL TRAFFIC: Aircraft operating in the traffic pattern or within sight of the tower, or aircraft known to be departing or arriving from the local practice areas, or aircraft executing practice instrument

approach procedures. Typically, this includes touch and-go training operations.

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

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

LONG RANGE NAVIGATION SYSTEM (LORAN): Long range navigation is an electronic navigational aid which determines aircraft position and speed by measuring the difference in the time of reception of synchronized pulse signals from two fixed transmitters. Loran is used for en route navigation.

LOW INTENSITY RUNWAY LIGHTS: The lowest clas- sification in terms of intensity or brightness for lights designated for use in delineating the sides of a runway.

M

MEDIUM INTENSITY RUNWAY LIGHTS: The middle classification in terms of intensity or brightness for lights designated for use in delineating the sides of a runway.

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

MILITARY OPERATIONS: Aircraft operations that are performed in military aircraft.

MILITARY OPERATIONS AREA (MOA): See special-use airspace

MILITARY TRAINING ROUTE: An air route depicted on aeronautical charts for the conduct of military flight training at speeds above 250 knots.

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

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

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

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

N

NATIONAL AIRSPACE SYSTEM: The network of air traffic control facilities, air traffic control areas, and navigational facilities through the U.S.

NATIONAL PLAN OF INTEGRATED AIRPORT SYSTEMS: The national airport system plan developed by the Secretary of Transportation on a biannual basis for the development of public use airports to meet national air transportation needs.

NATIONAL TRANSPORTATION SAFETY BOARD: A federal government organization established to investigate and determine the probable cause of transportation accidents, to recommend equipment and procedures to enhance transportation safety, and to review on appeal the suspension or revocation of any certificates or licenses issued by the Secretary of Transportation.

NAUTICAL MILE: A unit of length used in navigation which is equivalent to the distance spanned by one minute of arc in latitude, that is, 1,852 meters or 6,076 feet. It is equivalent to approximately 1.15 statute mile.

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

NAVIGATIONAL AID: A facility used as, available for use as, or designed for use as an aid to air navigation.

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

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

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

NOTICE TO AIRMEN: A notice containing information concerning the establishment, condition, or change in any component of or hazard in the National Airspace System, the
timely knowledge of which is considered essential to personnel concerned with flight operations.

O

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

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

ONE-ENGINE INOPERABLE SURFACE: A surface emanating from the runway end at a slope ratio of 62.5:1. Air carrier airports are required to maintain a technical drawing of this surface depicting any object penetrations by January 1, 2010.

OPERATION: The take-off, landing, or touch-and-go procedure by an aircraft on a runway at an airport.

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.

P

PILOT CONTROLLED LIGHTING: Runway lighting systems at an airport that are controlled by activating the microphone of a pilot on a specified radio frequency.

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

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

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

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

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

PRECISION APPROACH RADAR: A radar facility in the terminal air traffic control system used to detect and display with a high degree of accuracy the direction, range, and elevation of an aircraft on the final approach to a runway.

PRECISION OBJECT FREE AREA (POFA): An area centered on the extended runway centerline, beginning at the runway threshold and extending behind the runway threshold that is 200 feet long by 800 feet wide. The POFA is a clearing standard which requires the POFA to be kept clear of above ground objects protruding above the runway safety

area edge elevation (except for frangible NAVAIDS). The POFA applies to all new authorized instrument approach procedures with less than 3/4 mile visibility.

PRIMARY AIRPORT: A commercial service airport that enplanes at least 10,000 annual passengers.

PRIMARY SURFACE: An imaginary obstruction limiting surface defined in FAR Part 77 that is specified as a rectangular surface longitudinally centered about a runway. The specific dimensions of this surface are a function of the types of approaches existing or planned for the runway.
PROHIBITED AREA: See special-use airspace.

PVC: Poor visibility and ceiling. Used in determining Annual Service Volume. PVC conditions exist when the cloud ceiling is less than 500 feet and visibility is less than one mile.

R

RADIAL: A navigational signal generated by a Very High Frequency Omni-directional Range or VORTAC station that is measured as an azimuth from the station.

REGRESSION ANALYSIS: A statistical technique that seeks to identify and quantify the relationships between factors associated with a forecast.

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

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

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

RESTRICTED AREA: See special-use airspace.

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

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

RUNWAY ALIGNMENT INDICATOR LIGHT: A series of high intensity sequentially flashing lights installed on the extended centerline of the runway usually in conjunction with an approach lighting system.

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

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

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

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

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

any point five feet above an intersecting runway centerline.

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

S

SCOPE: The document that identifies and defines the tasks, emphasis, and level of effort associated with a project or study.

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

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

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

SMALL AIRPLANE: An airplane that has a maximum certified takeoff weight of up to 12,500 pounds.

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

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

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

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

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

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

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

STANDARD INSTRUMENT DEPARTURE (SID): A preplanned coded air traffic control IFR departure routing, preprinted for pilot use in graphic and textual form only.

STANDARD INSTRUMENT DEPARTURE PROCEDURES: A published standard flight procedure to be utilized following takeoff to provide a transition between the airport and the terminal area or en route airspace.

STANDARD TERMINAL ARRIVAL ROUTE (STAR): A preplanned coded air traffic control IFR arrival routing, preprinted for pilot use in graphic and textual or textual form only.

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

STOPWAY: An area beyond the end of a takeoff runway that is designed to support an aircraft during an aborted takeoff without causing structural damage to the aircraft. It is not to be used for takeoff, landing, or taxiing by aircraft.

STRAIGHT-IN LANDING/APPROACH: A landing made on a runway aligned within 30 degrees

of the final approach course following completion of an instrument approach.

T

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

TAKEOFF RUNWAY AVAILABLE (TORA): See declared distances.

TAKEOFF DISTANCE AVAILABLE (TODA): See declared distances.

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

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

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

TERMINAL INSTRUMENT PROCEDURES: Published flight procedures for conducting instrument approaches to runways under instrument meteorological conditions.

TERMINAL RADAR APPROACH CONTROL: An element of the air traffic control system responsible for monitoring the en-route and terminal segment of air traffic in the airspace surrounding airports with moderate to high levels of air traffic.

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

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

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

TOUCHDOWN: The point at which a landing aircraft makes contact with the runway surface.

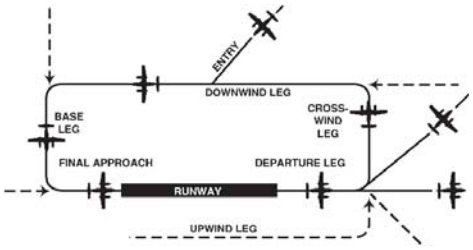
TOUCHDOWN AND LIFT-OFF AREA (TLOF): A load bearing, generally paved area, normally centered in the FATO, on which the helicopter lands or takes off.

TOUCHDOWN ZONE (TDZ): The first 3,000 feet of the runway beginning at the threshold.

TOUCHDOWN ZONE ELEVATION (TDZE): The highest elevation in the touchdown zone.

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

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



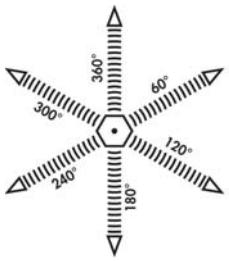
U

UNCONTROLLED AIRPORT: An airport without an air traffic control tower at which the control of Visual Flight Rules traffic is not exercised.

UNCONTROLLED AIRSPACE: Airspace within which aircraft are not subject to air traffic control.

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

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



V

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

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

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

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

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

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

VISUAL METEOROLOGICAL CONDITIONS: Meteorological conditions expressed in terms of specific visibility and ceiling conditions which are equal to or greater than the threshold values for instrument meteorological conditions.

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

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

W

WARNING AREA: See special-use airspace.

WIDE AREA AUGMENTATION SYSTEM: An enhancement of the Global Positioning System that includes integrity broadcasts, differential corrections, and additional ranging signals for the purpose of providing the accuracy, integrity, availability, and continuity required to support all phases of flight.

Abbreviations

AC: advisory circular

ADF: automatic direction finder

ADG: airplane design group

AFSS: automated flight service station

AGL: above ground level

AIA: annual instrument approach

AIP: Airport Improvement Program

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

ALS: approach lighting system

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

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

AOA: Aircraft Operation Area

APV: instrument approach procedure with vertical guidance

ARC: airport reference code

ARFF: aircraft rescue and fire fighting

ARP: airport reference point

ARTCC: air route traffic control center

ASDA: accelerate-stop distance available

ASR: airport surveillance radar

ASOS: automated surface observation station

ATCT: airport traffic control tower

ATIS: automated terminal information service

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

AWOS: automated weather observation station

BRL: building restriction line

CFR: Code of Federal Regulation

CIP: capital improvement program

DME: distance measuring equipment

DNL: day-night noise level

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

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

FAA: Federal Aviation Administration

FAR: Federal Aviation Regulation

FBO: fixed base operator

FY: fiscal year

GPS: global positioning system

GS: glide slope

HIRL: high intensity runway edge lighting

IFR: instrument flight rules (FAR Part 91)

ILS: instrument landing system

IM: inner marker

LDA: localizer type directional aid

LDA: landing distance available

LIRL: low intensity runway edge lighting

LMM: compass locator at ILS outer marker

LORAN: long range navigation

MALS: midium intensity approach lighting system with indicator lights

MIRL: medium intensity runway edge lighting

MITL: medium intensity taxiway edge lighting

MLS: microwave landing system

MM: middle marker

MOA: military operations area

MLS: mean sea level

NAVAID: navigational aid

NDB: nondirectional radio beacon

NM: nautical mile (6,076.1 feet)

NPES: National Pollutant Discharge Elimination System

NPIAS: National Plan of Integrated Airport Systems

NPRM: notice of proposed rule making

ODALS: omnidirectional approach lighting system

OFA: object free area

OFZ: obstacle free zone

OM: outer marker

PAC: planning advisory committee

PAPI: precision approach path indicator

PFC: porous friction course

PFC: passenger facility charge

PCL: pilot-controlled lighting

PIW public information workshop

PLASI: pulsating visual approach slope indicator

POFA: precision object free area

PVASI: pulsating/steady visual approach slope indicator

PVC: poor visibility and ceiling

RCO: remote communications outlet

REIL: runway end identifier lighting

RNAV: area navigation

RPZ: runway protection zone

RSA: runway safety area

RTR: remote transmitter/receiver

RVR: runway visibility range

RVZ: runway visibility zone

SALS: short approach lighting system

SASP: state aviation system plan

SEL: sound exposure level

SID: standard instrument departure

SM: statute mile (5,280 feet)

SRE: snow removal equipment

SSALF: simplified short approach lighting system with runway alignment indicator lights

STAR: standard terminal arrival route

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

TACAN: tactical air navigational aid

TDZ: touchdown zone

TDZE: touchdown zone elevation

TAF: Federal Aviation Administration (FAA) Terminal Area Forecast

TODA: takeoff distance available

TORA: takeoff runway available

TRACON: terminal radar approach control

VASI: visual approach slope indicator

VFR: visual flight rules (FAR Part 91)

VHF: very high frequency

VOR: very high frequency omni-directional range

VORTAC: VOR and TACAN collocated

APPENDIX B

ECONOMIC BENEFIT ANALYSIS

HIGHLIGHTS

This report presents an analysis of the economic benefits of Camarillo Airport for the economy of the airport service area, which includes the City of Camarillo as well as all of Ventura County.

Camarillo Airport serves as a gateway that welcomes commerce and visitors into the region and provides access for citizens and businesses to travel outward via general aviation. Economic benefits (revenues, employment and earnings) are created when economic activity takes place both on and off the airport. The highlights of the economic benefit analysis are set out below.

HIGHLIGHTS

Economic Benefit Analysis
Camarillo Airport

- **Camarillo Airport contributed total economic benefits (including all multiplier effects) of $163.6 million to the airport service area in 2008.**
- **The primary economic benefits (not including multiplier effects) of on-airport activity and off-airport visitor spending summed to $86.9 million in 2008.**
- **The 2008 economic benefits were twice as large as the 1995 economic benefits (adjusted to constant 2008 dollars).**
- **Aviation-related employers produced $77.4 million of economic activity, with earnings to the 332 workers and proprietors on the airport of $16.4 million (not including capital projects).**
- **General aviation travelers using Camarillo Airport accounted for 23,704 visitor days in the airport service area, and visitor expenditures were $3.3 million for the year.**
- **Sixty-one percent of based aircraft owners responded that the airport is important to the success of their businesses.**
- **Based aircraft at the airport flew 47,400 hours in 2008; this travel had an estimated charter equivalent value of $26.5 million.**
- **Each day of the year, Camarillo Airport generates more than $400,000 of revenue within the service area which supports sales, jobs and earnings in the general economy.**

MEASURING BENEFITS

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

General aviation allows business travelers to reach destinations without the delays and uncertainty of today's airline flights and provides access to more than 5,300 airports in the nation, compared to approximately 565 served by scheduled airlines.

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

Economic benefit studies differ from cost-benefit analyses, which are often called for to support decision-making, typically for public sector capital projects.

Study of economic benefit is synonymous with measurement of economic contribution. The methodology was standardized in the publication by the Federal Aviation Administration, *Estimating the Regional Economic Significance of Airports*, Washington DC, 1992.

Following the FAA methodology, this study measures the contribution of Camarillo Airport as a source of economic output (the production of aviation services) that creates revenues for firms, and employment and earnings for workers on and off the airport.

Aviation spending on the airport injects revenues into the community when firms buy products from suppliers and again when employees of the airport spend for household goods and services. In addition, spending by air visitors produces revenues for firms in the hospitality sector as well as employment and earnings for workers.

Benefit Measures

The quantitative measures of economic benefits of the Camarillo Airport are each described below.

Revenue is the value in dollars of the output of goods and services produced by businesses. For government units, the budget is used as the value of output.

Output is equivalent to revenue or spending or sales. From the perspective of the business that is the supplier of goods and services, the dollar value of output is equal to the revenues received by that producer. From the viewpoint of the consumer, the dollar value of the output is equal to the amount that the consumer spent to purchase those goods and services from the business.

Earnings are a second benefit measure, made up of employee compensation (the dollar value of payments received by workers as wages and benefits) and proprietor's income of business owners.

Employment is the third benefit measure, the number of jobs supported by the revenues created by the airport.

To measure the economic benefits of the airport, information on revenues, employment and earnings was obtained directly from suppliers and users of aviation services through on-site interviews, mailed survey forms, and telephone follow-up. Those contacted included private sector firms on the airport, government agencies, general aviation air travelers, and based aircraft owners. Camarillo Airport staff provided valuable assistance with data collection.

TABLE B1
Summary of Economic Benefits: 2008
Camarillo Airport

	BENEFIT MEASURES		
Source	**Revenues**	**Earnings**	**Employment**
On-Airport Economic Benefits	**$83,613,000**	**$19,417,000**	**379**
Air Visitor Benefits	**3,339,000**	**1,300,000**	**48**
Primary Benefits: Sum of On-Airport & Air Visitor Benefits	**86,952,000**	**20,717,000**	**427**
Secondary Benefits (Multiplier Effects)	***76,648,000***	***19,982,000***	***403***
TOTAL BENEFITS	**$163,600,000**	**$40,699,000**	**830**

ECONOMIC BENEFIT SUMMARY

The economic benefits of Camarillo Airport for 2008 are shown in Table B1.

For 2008, the total benefits of the airport, including on-airport, air visitor, and secondary benefits (which result as dollars recirculate in the regional economy), were calculated to be:

- **$163.6 Million Revenues**
- **$40.7 Million Earnings**
- **830 Total Employment**

On-Airport Benefits

At the time of the inventory for preparation of the Master Plan, there were 533 based aircraft on the airport, including 429 single engine planes, 51 multi engine piston planes, 11 turboprop, 22 jets, and 20 helicopters or other craft.

Aviation-related activity on Camarillo Airport supported a total of 27 private and public employers including full FBO services, aircraft sales, pilot training, avionics, aircraft repair and maintenance, and government agencies. Contractors working on capital projects also created jobs, earnings and revenues on the airport.

All combined aviation-related employers were responsible for on-airport benefits of:

- **$83.6 Million Revenues**
- **$19.4 Million Earnings**
- **379 On-Airport Jobs**

Air Visitor Benefits

An important source of aviation-related spending comes from the more than 16,000 air visitors that arrive at the airport each year on general aviation aircraft.

Visitors traveling for business or personal reasons spend for lodging, food and drink, entertainment, retail goods and services, and ground transportation including auto rental and taxis, creating annual airport service area output, employment and earnings of:

- **$3.3 Million Revenues**
- **$1.3 Million Earnings**
- **48 Off-Airport Visitor Jobs**

Primary Benefits

The primary benefits represent the sum of on-airport and air visitor revenues, earnings and employment due to the presence of the airport. Primary benefits are the "first round" impacts and do not include any multiplier effects of secondary spending. The primary benefits of on-airport and air visitor economic activity related to Camarillo Airport were:

- **$86.9 Million Revenues**
- **$20.7 Million Earnings**
- **427 Jobs**

Combined revenue flows for businesses and employers on and off the airport sum to a value of $86.9 million. The airport presence created benefits to workers by providing incomes of $20.7 million. There were 427 jobs supported directly by the suppliers and users of aviation services.

Secondary Benefits

Secondary benefits or multiplier effects are created when the initial spending by airport employers or visitors circulates and recycles through the economy. In contrast to initial or primary benefits, the secondary benefits measure the magnitude of successive rounds of re-spending as those who work for or sell products to airport employers or the hospitality sector spend dollars.

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

Input-output analysis shows the initial revenue stream of $86.9 million created by the presence of the airport stimulated secondary benefits from multiplier effects within the service area of:

- **$76.6 Million Revenues**
- **$19.9 Million Earnings**
- **403 Jobs**

Value of Based Aircraft Travel

Owners of general aviation aircraft based at the airport reported 47,400 business and personal hours flown in 2008. One method of computing the economic value of the use of private aircraft is to determine what the cost would be for hiring charter flights to make the same trips. The Charter Equivalent Value of general aviation flights originated by aircraft based at Camarillo Airport was computed as $26.5 million, or more than $49,000 of equivalent value per aircraft per year. This figure is not included in the totals reported in Table B1, but should be recognized nonetheless as a benefit of general aviation.

ON-AIRPORT BENEFITS

In recent years, analysts and planners have become increasingly aware of the importance of airports as drivers of economic growth within a region.

To measure economic benefits on the airport, surveys were distributed to airport employers to collect data on employment and economic activity. In addition, interviews were conducted and telephone follow-up contact was made to supplement the surveys in some cases. Respondents were informed that the survey results were confidential and only aggregate totals would appear in the written report.

Camarillo Airport offers a range of FBO services available for the aviation community including general aviation aircraft repairs and maintenance, avionics, painting and upholstery refurbishing, inspections, and fueling for various categories of aircraft including piston, turboprop, helicopters and jet.

Firms on the airport provide aircraft charter and rental, as well as aircraft sales and brokerage. Pilot training on various aircraft is available, from introductory to advanced instruction.

City-owned and private hangar space is available in several structures on the airport, ranging to 2,000 square foot box hangars.

Administrative and government agencies on the airport include the Camarillo Airport administration, the Ventura County Sheriff aviation unit, and the FAA air traffic control tower. The airport also houses several organizations dedicated to aviation, aviation history, and commemoration of aviation.

An important feature of the airport is the presence of private and governmental non-aviation employers that create jobs and income.

Private employers range from those engaged in high technology research and light manufacturing to various financial and internet service firms, to musical instruments.

County agencies on the airport include the Sheriff's department, fire department, probation, and animal control. Other governmental units offer education and various health and social services.

While these non-aviation employers are not included in the computed economic benefits of the airport, they are part of the greater airport economic community, and contribute to the "economic footprint" of the airport as an employment center for Ventura County.

Capital Projects

Capital projects are vital for airports to maintain safety and provide for growth. Capital spending for airport improvements also creates jobs and injects dollars into the local economy.

Camarillo Airport has seen a number of capital improvement programs and private development projects in recent years. Improvements include apron rehabilitation, reconstruction of runways and taxiways, drainage improvement, lighting projects, and improvements to gates and fences. Private firms have made significant investments in improved and new facilities to expand services on the airport.

In order to account for varying annual magnitude of improvements authorized or started, as well as capital projects that extend over consecutive years, an average annual capital spending estimate was computed based on several years of activity. Private and public spending for construction projects on-going or authorized in 2008 was set at $6.2 million to represent a typical year, recognizing that some years would have more and other years would have less on-site improvement spending.

On-Airport Output

On-airport economic activity created annual output of $83.6 million. Aviation-related private sector revenues (not including capital projects) were $68.0 million, or 81 percent of the total. Construction projects pro-rated for 2008 had value of $6.2 million and aviation-related governmental budgets were $9.4 million (Table B2).

Employment and Earnings

There were 24 private aviation employers on the airport in 2008 and 3 aviation related government units. In addition, private contractors had employees on the airport to complete capital projects during the year.

Surveys and interviews with on-airport employers provided a tally of 379 jobs on the airport (including 47 workers for capital projects). Including construction workers, the ratio of private sector jobs to overall jobs was 323/379 or 85 percent of the total. On airport employees brought home annual earnings of $19.4 million to spend in their own neighborhoods and the general economy.

On-Airport Summary

Aviation-related economic activity on the airport by private employers and government agencies summed to $83.6 million of revenues and 379 jobs created. Payroll and proprietor's income (earnings) was $19.4 million.

TABLE B2
On-Airport Benefits: Revenues, Earnings and Employment
Camarillo Airport

	BENEFIT MEASURES		
Sources of On-Airport Benefits	**Revenues**	**Earnings**	**Employment**
Private Aviation Employers **Avionics** **Aircraft Sales** **Aircraft Storage** **Aircraft Maintenance & Repair** **FBO Services, Fueling, Supplies** **Aviation Education & Training**	**$67,997,000**	**$13,583,000**	**276**
Capital Projects **Private & Public Projects** **Upgrades, Improvements** **New Construction & Maintenance**	**$6,200,000**	**$3,039,000**	**47**
Government Agencies/Services **Airport Administration** **Sheriff Dept Aviation Unit** **FAA Air Traffic Control Tower**	**$9,416,000**	**$2,795,000**	**56**
ON-AIRPORT BENEFITS	**$83,613,000**	**$19,417,0000**	**379**

Source: Survey of Employers, Camarillo Airport, 2008

AIR VISITOR BENEFITS

Camarillo Airport attracts general aviation visitors from throughout the region and the nation who come to the area for business, recreational and personal travel, including visiting relatives, medical consultation, or retail and investment spending.

This section provides detail on economic benefits from general aviation air travelers who use the airport. Values shown for spending (revenues), employment and earnings are benefits of initial visitor outlays and do not include secondary benefits of multiplier effects.

General Aviation Visitors

In order to analyze general aviation traffic patterns at the airport, a database of 3,400 general aviation flight plans involving Camarillo Airport as either the destination or origin for travel was obtained from the FAA.

In this sample, the most frequent source of itinerant flights arriving at Camarillo Airport was Van Nuys. Second in importance was Santa Barbara, followed by Santa Ana, San Diego, and La Verne (Brackett Field). Overall, general aviation aircraft arriving at Camarillo during the study period originated at more than 250 airports around the Western region and the nation.

According to data from the FAA, there were some 78,000 itinerant operations at Camarillo Airport in calendar year 2008. Operations involve both arrivals and departures.

TABLE B3
GA Aircraft Itinerant Origination
Camarillo Airport

Rank and Origin	State
1. Van Nuys	CA
2. Santa Barbara	CA
3. Santa Ana	CA
4. San Diego	CA
5. La Verne	CA
6. Santa Monica	CA
7. Los Angeles	CA
8. Las Vegas	NV
9. Lompoc	CA
10. Long Beach	CA
11. Santa Maria	CA
12. Burbank	CA
13. Ontario	CA
14. Oxnard	CA
15. Oakland	CA
16. Palm Springs	CA
17. Carlsbad	CA
18. Bakersfield	CA
19. San Jose	CA
20. Chino	CA

Source: FAA Flight Plan Data Base and Camarillo Airport Records

It is useful to differentiate between itinerant operations by based and transient aircraft. An itinerant operation involves an origination or destination airport other than Camarillo Airport. However, both based and non-based aircraft contribute to itinerant activity in any given day.

When a Camarillo based aircraft returns to Camarillo Airport from a flight to Sacramento, for example, that is an itinerant operation. When an aircraft based at an airport other than Camarillo arrives at Camarillo Airport, that aircraft is classified as a transient itinerant.

Transient aircraft bring benefits to the airport service area when they spend for fuel or maintenance while at the airport, or when visitors spend for food, lodging, and other expenses such as auto rental in the Camarillo area. Overnight transient visitors typically have much larger expenditures than transient visitors who stay only for a portion of a day.

According to analysis of FAA data, there were 38,987 itinerant aircraft arrivals at Camarillo Airport in 2008. Of these, 15,595 were transients, aircraft based at another airport. 3,119 brought overnight visitors and 12,476 were one-day visitors (Table B4).

TABLE B4
General Aviation Transient Aircraft
Camarillo Airport

Item	Annual Value
Itinerant AC Arrivals	**38,987**
Transient AC Arrivals	**15,595**
Overnight Transient AC	**3,119**
One Day Transient AC	**12,476**

Source: Derived from FAA Data and Camarillo Airport Records

Separate analyses were conducted for those GA visitors with an overnight stay and those whose visit was one day or less in duration. Information on visiting general aviation aircraft was derived from a mail survey of visiting aircraft owners and pilots. Visitors were asked about the purpose of their trip, the size of the travel party, length of stay, type of lodging, and outlays by category.

Overnight GA Visitors

The travel patterns underlying the calculation of overnight GA visitor economic benefits are shown in Table B5, for the 3,119 transient overnight aircraft arrivals during the year.

TABLE B5
General Aviation Overnight Visitors
Camarillo Airport

Item	Annual Value
Transient AC Arrivals	**15,595**
Overnight Transient AC	**3,119**
Avg. Party Size	**2.2**
Number of Visitors	**6,862**
Average Stay (Days)	**2.0**
Visitor Days	**13,724**
Spending per Aircraft	**$893**
Total Expenditures	**$2,785,000**

Source: Derived from FAA Data, Camarillo Airport Records and GA Visitor Survey

The average party size was 2.2 persons and the average overnight travel party stayed in the area for 2.0 days. There were 6,862 overnight visitors for the year, with a combined total of 13,724 visitor days. Spending per travel party per overnight aircraft averaged $893. Total spending by all GA overnight visitors summed to $2.8 million for the year.

Table B6 shows the percentage distribution of outlays by overnight travel parties at Camarillo Airport. Lodging accounts for 36 percent of visitor spending, averaging $320 per aircraft travel party.

Food and drink was the second largest category, at $254 per aircraft, accounting for 28 percent of the visitor spending dollar. Retail spending and entertainment were $127 and $80 per aircraft travel party. Ground transportation was the smallest expenditure category, at $112 for the average visiting overnight general aviation travel party.

TABLE B6
Spending Per Overnight GA Aircraft
Camarillo Airport

Category	Spending	Percent
Lodging	**$320**	**36**
Food/Drink	**254**	**28**
Retail	**127**	**14**
Entertainment	**80**	**9**
Transportation	**112**	**13**
TOTAL	**$893**	**100**

Source: GA Visitor Survey

Day GA Visitors

According to flight operations records, during 2008 there were 12,476 transient aircraft that stopped at the airport for one day or less. Some were only on the ground for a few minutes while others were parked several hours when the travel party had their aircraft serviced, pursued a personal activity or conducted business. Those pilots that buy fuel or have their aircraft serviced on the airport are making purchases which contribute to the revenue stream received by aviation businesses on the airport. That type of spending creates output, employment, and earning on the airport. Those economic benefits are shown in Table B2 as on-airport benefits.

However, if the aircraft travel party leaves the airport to visit a corporate site, participate in a business meeting, or attend a sporting or cultural event, these activities generate off-airport spending that creates jobs and earnings in the local community.

Detailed arrival and departure records were analyzed to estimate the number of aircraft parked for four hours or more (but not overnight), a period of sufficient duration to allow off-airport spending. During 2008, 4990 day visitors (four hour stay) were identified.

TABLE B7
General Aviation Day Visitors
Camarillo Airport

Item	Annual Value
Transient AC Arrivals	**15,595**
One Day (4+ Hours) AC	**4,990**
Avg. Party Size	**2.0**
Number of GA Visitors	**9,980**
Spending per Aircraft	**$111**
Total Expenditures	**$554,000**

Source: Derived from FAA Data, Camarillo Airport Records and GA Visitor Survey

The 4,990 day trip aircraft brought 9,980 visitors to the Camarillo area during the year. The average spending per one-day aircraft was reported as $111 and total expenditures summed to $554,000 (Table B7).

TABLE B8
Spending Per Day Visitor Aircraft
Camarillo Airport

Category	Spending	Percent
Food/Drink	**54**	**48**
Retail	**22**	**20**
Entertainment	**19**	**17**
Transportation	**17**	**15**
TOTAL	**$111**	**100**

Source: GA Visitor Survey

The largest expenditure category for one-day visiting travel parties was purchase of food and beverages, which averaged $54 per aircraft travel party for the day and accounted for 48 percent of outlays (Table B8).

Spending for retail goods and services was the second largest category, at $22 per aircraft.

Combined GA Visitor Spending

Table B9 shows the economic benefits resulting from spending in the region by combined overnight and day general aviation visitors arriving at Camarillo Airport.

To recap, there were 15,595 transient general aviation aircraft that brought visitors to the airport during the year. Of these, 3,110 were overnight general aviation aircraft and 4,990 were parked for four hours or more for a day. Each overnight travel party spent an average of $893 during their trip to the airport service area and travelers on each day visitor aircraft reported spending $111 per trip.

Multiplying the expenditures for each category of spending by the number of aircraft yields the total outlays for lodging, food and drink, entertainment, retail spending and ground transportation due to GA visitors during the year. This spending summed to $3.3 million in annual revenues.

There were 6,682 overnight visitors and 9,980 one day visitors that arrived by general aviation aircraft at Camarillo Airport, providing a total of 16,662 air visitors.

Overnight visitors stayed an average of two days. Combined overnight and day visitors contributed a total of 23,704 visitor days attributable to general aviation travelers during the year. Fifty eight percent of visitor days (13,724) were due to overnight GA travelers and forty two percent (9,980) were from one-day visitors.

On an average day during 2008, there were 65 visitors in the Camarillo Airport service area that had arrived by general aviation aircraft.

Average daily spending by all GA air travelers was $9,148 each day within the airport service area. The average economic impact of any arriving GA transient aircraft (combined overnight and day visitor of four hours or more) was $412.

The largest single spending category by combined overnight and day visitors was for food and drink. The outlay of $1 million accounted for 32 percent of the $3.3 million spent by GA visitors. Spending by general aviation visitors for food and drink was $998,000. Taken together, these two categories accounted for 61 percent of

spending by visitors in the Camarillo Airport service area. The third largest category was retail sales, at $506,000.

Of total spending of $3.3 million created by GA visitors, an average of 39 cents of each dollar circulated within the service area as earnings generated by the presence of the airport. (Earnings include wages and salaries paid to workers as well as income received by proprietors of businesses.)

The earnings taken home by tourism/visitor sector workers and proprietors for spending in their own community summed to $1,300,000 during the year.

Expenditures by GA visitors created 48 jobs in the tourist sector in the Camarillo Airport service area. Food and drink spending created the greatest number of jobs and the largest dollar value of earnings received by workers and proprietors ($371,000).

TABLE B9
Economic Benefits from GA Visitors - Revenues, Earnings and Employment
Camarillo Airport

Category	Overnight AC Expenditures	One Day AC Expenditures	Total Visitor Expenditures	Earnings	Employment
Lodging	**$998,000**		**$998,000**	**$349,000**	**10**
Food/Drink	**792,000**	**$264,000**	**1,056,000**	**$371,000**	**19**
Retail Sales	**396,000**	**110,000**	**506,000**	**$233,000**	**9**
Entertainment	**250,000**	**95,000**	**345,000**	**$162,000**	**6**
Ground Trans.	**349,000**	**85,000**	**434,000**	**$185,000**	**4**
TOTAL	**$2,785,000**	**$554,000**	**3,339,000**	**$1,300,000**	**48**

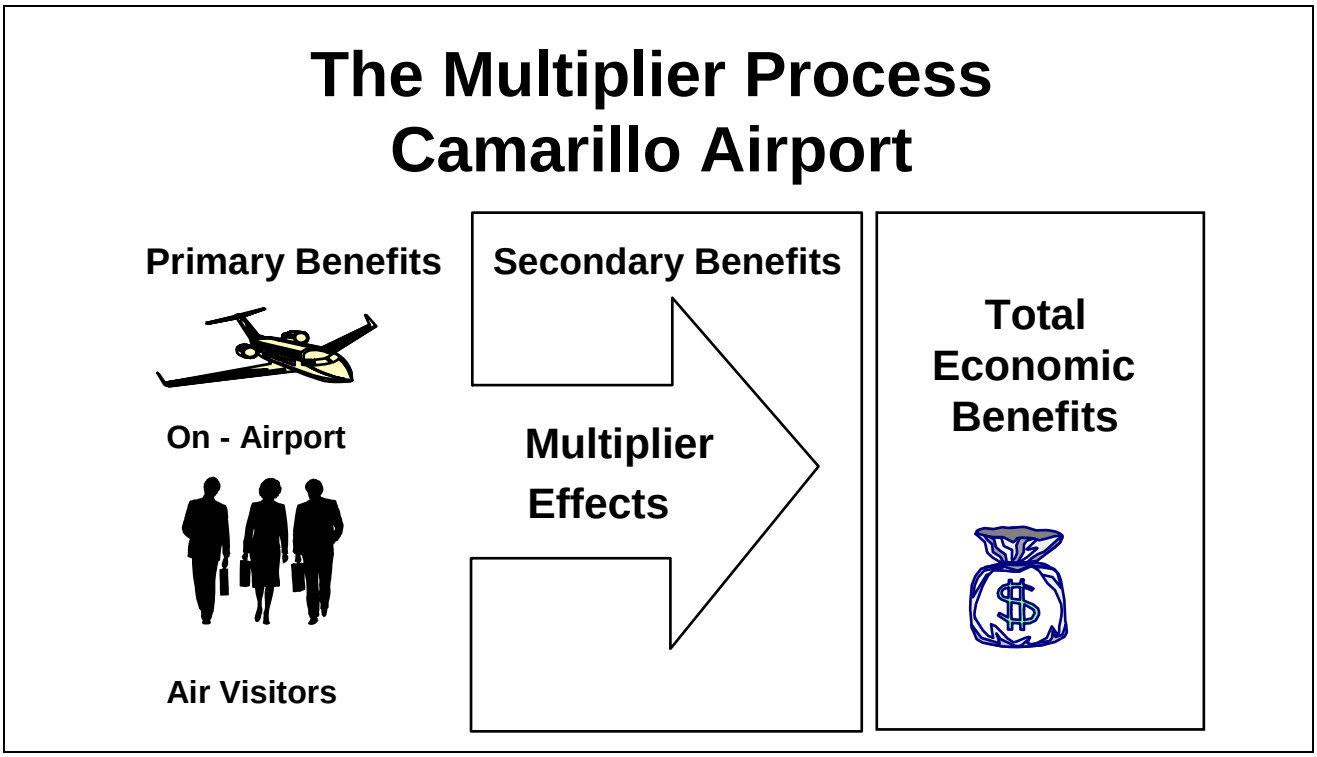
Note: Earnings and employment figures were derived from the IMPLAN input-output model based on data for Ventura County from the California Employment Development and the United States Bureau of Economic Analysis. Employment includes full and some part time workers, figures rounded to head counts.

SECONDARY BENEFITS: MULTIPLIER EFFECTS

The output, employment, and earnings from on-airport activity and off-airport visitor spending represent the computed primary benefits from the presence of Camarillo Airport. For the service area, these primary benefits summed to $86.9 million of output (measured as revenues to firms and budgets of administrative units), 427 jobs, and earnings to workers and proprietors of $27.7 million. These figures for initial economic activity created by the presence of the airport do not include the "multiplier effects" that result from additional spending induced in the economy to produce the initial goods and services.

Production of aviation output requires inputs in the form of supplies and labor. Purchase of inputs by aviation firms has the effect of creating secondary or multiplier revenues and employment that should be included in total benefits of the airport. Airport benefit studies rely on multiplier factors from input-output models to estimate the impact of secondary spending on output, earnings and employment to determine benefits, as illustrated in the figure below.

The multipliers used for this study were from the IMPLAN input-output model based on data for Ventura County from the California Employment Development Department and the U. S. Bureau of Economic Analysis. To demonstrate the methodology, average Camarillo Airport multipliers are shown in Table B10.



The multipliers represent weighted averages for combined industries in each category. For example, the visitor benefits multipliers shown combine lodging, food services, retailing, and entertainment multipliers used in the analysis.

The multipliers in this table illustrate the process for calculating the secondary and total impacts on all industries of the regional economy resulting from the initial impact of each aviation related industry. The multipliers for output show the average dollar change in revenues for all firms in the service area due to a one-dollar increase in revenues either on the airport or through visitor spending.

For example, each dollar of new output (revenue) created by on-airport employers circulates through the economy until it has stimulated ***total*** output in all industries in the service area of $1.8700 or, put differently, the revenue multiplier of 1.8700 for on-airport activity shows that for each dollar spent on the airport there is ***additional*** spending created as $0.87 of secondary or multiplier spending.

Primary revenues from all sources associated with the presence of Camarillo Airport were $86,952,000 for the year. After accounting for the multiplier effect, total revenues created within the service area were $163,600,000. Secondary revenues were $76,648,000, the difference between total and initial revenues.

The multiplier for earnings shows the dollar change in earnings for the economy due to a one-dollar increase in earnings either on the airport or in the visitor sector. The earnings multipliers determine how wages paid to workers on or off the airport stay within the economy and create additional spending and earnings for workers in other industries. For example, each dollar of wages paid for workers on the airport stimulates an additional $0.9383 of earnings in the total economy.

The initial wages of $19,417,000 for aviation workers and proprietors on the airport were spent for consumer goods and services that in turn created additional or secondary earnings of $18,220,000 for workers in the general economy.

The total earnings benefit of the on-airport activity was $37,637,000 consisting of the $19,417,000 initial benefits and the $18,220,000 secondary benefits. The economic interpretation is that the presence of the airport provided earnings for workers, who then re-spent these dollars in the service area, impacting the general economy.

The multipliers for employment show the total change in jobs for the service area due to an increase of one job on or off the airport. Each job on the airport is associated with 1.9663 total jobs in the rest of the airport service area. Similarly, each job in the hospitality industry supported by air visitor spending is associated with 1.7448 total jobs (primary + secondary) in the general economy.

The overall result is that the 427 initial jobs created by the presence of the airport supported an additional 403 jobs in the service area as secondary employment. The sum of the initial aviation related jobs and secondary jobs created in the general economy is the total employment of 830 workers that can be attributed to the presence of the airport.

The information above is intended for illustration only. In the full analysis, appropriate separate multipliers were used for the various categories on-airport aviation employers (FBO, food service, flight training, etc.) and visitor spending categories (lodging, food service, retail and entertainment).

TABLE B10
Average Multipliers and Secondary Benefits Within the Airport Service Area
Camarillo Airport

Revenue Source	Primary Revenues	Average Output Multipliers	Secondary Revenues	Total Revenues
On-Airport Benefits	**$83,613,000**	**1.8700**	**$72,743,000**	**$156,356,000**
Visitor Benefits	**3,339,000**	**2.1693**	**3,905,000**	**7,244,000**
Revenues	***$86,952,000***	**1.8814**	***$76,648,000***	***$163,600,000***
Earnings Source	Primary Earnings	Average Earnings Multipliers	Secondary Earnings	Total Earnings
On-Airport Benefits	**$19,417,000**	**1.9383**	**$18,220,000**	**$37,637,000**
Visitor Benefits	**1,300,000**	**2.3549**	**1,762,000**	**3,062,000**
Earnings	***$20,717,000***	**1.9645**	***$19,982,000***	***$40,699,000***
Employment Source	Primary Employment	Average Employment Multipliers	Secondary Employment	Total Employment
On-Airport Benefits	**379**	**1.9663**	**366**	**745**
Visitor Benefits	**48**	**1.7448**	**37**	**85**
Employment	**427**	**1.9412**	**403**	**830**

Notes: Multipliers above are weighted averages intended to illustrate how secondary and total benefits were calculated for Camarillo Airport. In the full analysis, separate multipliers were used for on-airport employers (FBO and other airport businesses), and visitor spending (lodging, eating places, retailing, entertainment). Multipliers were for Ventura County as produced by the IMPLAN input-output model based on data from the California Employment Development Department and U. S. Bureau of Economic Analysis.

BASED AIRCRAFT BENEFITS

A survey of owners of aircraft based at Camarillo Airport was conducted to compile information on private aircraft usage patterns, including number of trips per year, purpose of travel, average party size, and hours flown per trip. Questions were also posed concerning the importance of the airport for residential location and businesses of flyers.

TABLE B11
Based Aircraft Profile
Camarillo Airport

Type	Number
Total Based Aircraft	**533**
Single Engine Piston	**429**
Multi-Engine Piston	**51**
Turboprop	**11**
Jet	**22**
Helicopter/Other	**20**
Source: Camarillo Airport	

Mailing addresses were obtained through the assistance of Camarillo Airport administration who provided access to public records on aircraft ownership.

There were 533 based-aircraft at Camarillo Airport (Table B11). Of these, 429 were single engine, 51 were multi-engine, 11 were turboprop, there were 22 jets, and 20 helicopters.

Characteristics of based aircraft at Camarillo Airport are shown in Table B12. The table sets out survey data, showing the average reported value for an individual aircraft was $132,300 and annual outlays were $13,686 for maintenance, upkeep, storage, and other expenses such as insurance.

Multiplying the average expenditures per aircraft of $13,686 times 533 aircraft gives total outlays by aircraft owners of $7.3 million injected into the economy, much of it going to the immediate airport service area.

The aircraft based at Camarillo Airport represent assets to their owners with estimated total value exceeding $70 million. Many based aircraft are viewed as investments by their owners that provide returns through enhanced revenues and time savings when compared to scheduled airline travel. Entries in Table B12 also illustrate the relation between private aircraft ownership and business activity in the Camarillo County area served by the airport.

Aircraft owners contribute to the economy when they use their aircraft for business purposes. Faster travel and more responsive businesses make the entire region more competitive. According to the aircraft owner survey, Camarillo based aircraft were used for business for 14,400 flying hours during 2008.

The presence of the airport as a factor affecting the personal quality of life and business success of aircraft owners was measured by survey questions asking respondents to rate the airport as “very important, important, slightly important, or not important” to their residential location decision and their business.

The survey results show that Camarillo Airport is a significant factor in influencing the success of business and professional activity of aircraft owners.

- **More than 60 percent of all responding based aircraft owners (61%) said that the airport is "very important" or "important" to the success of their business.**

- **Similarly, 86 percent of based aircraft owners stated that the airport is "very important" or "important" to their residential location decision.**

Those who reported the airport as important to their business were also asked for information about their business.

- **Firms represented by users of based aircraft for business purposes accounted for 14,618 employees in the county and surrounding area; annual sales of these firms was reported as $3.5 billion**

Drawing from these results, it is evident that Camarillo Airport plays a key role in the overall quality of life and level of economic activity in the Camarillo County area, and particularly supports the business community.

TABLE B12
Based Aircraft Characteristics and Business Activity
Camarillo Airport

Category	All Based AC
Average Aircraft Value	**$132,300**
Maintenance & Upkeep per Year	**$13,686**
Total Business Hours Flown per Year	**14,400**
Business Hours as Percent of All Hours	**30%**
Airport "Very Important" /"Important" to Business	**61%**
Employees of Owners of Based Aircraft	**14,618**
Annual Sales at Firms Related to Based AC	**$3,575,000,000**

Notes: Figures are derived from Based Aircraft Owner Survey, 2008

Based aircraft owners at Camarillo Airport reported flying 47,400 non-training hours per year (Table B13). Of these, 14,400 or 30 percent were for business and 33,000 or 70 percent were for personal travel. Of all owners, 39 percent reported some business use for their aircraft.

TABLE B13
Based Aircraft Use Patterns
Camarillo Airport

Usage Measure	Annual Hours
Total Number of Hours	47,400
Business Hours	14,400
Personal Hours	33,000
Percent Business Hours	30%
Percent Personal Hours	70%

Source: Based Aircraft Owner Survey

The typical business trip for a general aviation aircraft had 1.7 persons in the travel party (Table B14), according to survey responses completed by aircraft owners. The average aircraft was flown 27 hours on business during the year. Camarillo Airport based aircraft flew 24,480 passenger hours during the year for business purposes.

The average aircraft based at Camarillo Airport was flown 62 hours on personal trips per year. The typical round trip for pleasure, recreation or other personal reasons had 2.1 persons in the travel party (Table B15). There were 69,300 passenger hours flown for personal reasons that originated at Camarillo Airport during the year.

(Note: Passenger hours flown on business or personal use were computed from multiplying average party size by hours flown, to obtain total passenger hours.)

TABLE B14
Based Aircraft - Business Use
Camarillo Airport

Item	Annual Value
Business Hours	14,400
Avg. Hours per AC	27
Avg. Party Size	1.7
Passenger Hours	24,480

Source: Based Aircraft Owner Survey

TABLE B15
Based Aircraft - Personal Use
Camarillo Airport

Usage Measure	Annual Value
Personal Hours	33,000
Avg. Hours per AC	62
Avg. Party Size	2.1
Passenger Hours	69,300

Source: Based Aircraft Owner Survey

An estimate of the value of travel on based aircraft may be obtained by computing the cost of making these same trips on a chartered flight. This approach is approved by the Internal Revenue Service for valuation of aircraft travel use by corporate executives.

The cost of charter flights varies by time, distance and type of aircraft. Table B16 shows charter rates for air travel in Southern California at mid-year 2008. A weighted average charter cost was determined for single, multi engine, turbo and jet aircraft by assigning a cost equivalent weighted by the number of each aircraft type based at the airport. For example, since 84% of the aircraft are single engine, the cost of a single engine charter had a weight of 0.84 in the charter cost for single and multi engine flights, to produce a weighted charter cost of $559 per hour for charters (helicopters were excluded from this analysis). The 513 fixed wing aircraft based at the airport flew 47,400 hours for the year. Assigning an average charter value of $559 per hour, the "charter equivalent value" of general aviation travel originating at Camarillo Airport for the year totaled $26.5 million.

The computation is a conservative estimate of the value of general aviation travel. The estimate does not include all costs associated with charter service, such as standby fees, landing fees, or the standard two hour minimum requirement. Also, this value of travel estimate does not accurately measure all the associated economic gains that result from business trips. A single air trip can result in additional profits, fees, or revenues to a firm. Further, the flexibility compared to scheduled airline travel and the time saved compared to automobile use is not calculated here, but has economic significance.

TABLE B16
Charter Equivalent Value of General Aviation Travel
Camarillo Airport

Aircraft Type	Number	Weights	Hourly Charter Cost	Weighted Charter Cost
Single Engine	**429**	**0.84**	**$450**	**$376**
Twin Engine	**51**	**0.10**	**700**	**70**
Turboprop	**11**	**0.02**	**1,050**	**23**
Jet	**22**	**0.04**	**2,100**	**90**
TOTAL	**513**			**$559**

Charter Equivalent Value Based On Weighted Cost Per Hour

	Hours	Hourly Cost	Total Value	
	47,400	**$559**	**$26,497,000**	

Note: Charter costs by aircraft type based on average of rates as posted by various firms serving Southern California. Does not include standby time, landing fees, other charges including standard 2 hour minimum charge for charter travel.

SUMMARY & FUTURE BENEFITS

Airports are available to serve the flying public and support the regional economy every day of the year. On a typical day at Camarillo Airport, there are more than 380 operations by aircraft involved in local or itinerant activity including flight instruction, touch and go operations, corporate travel, or transient aircraft bringing passengers visiting the area for personal travel or on business.

During each day of the year, Camarillo Airport generates more than $400,000 of revenues within its service area (see box). Revenues and production support jobs, not only for the suppliers and users of aviation services, but throughout the economy.

Each day Camarillo Airport provides 379 jobs on the airport and in total supports 830 area workers bringing home their daily earnings for spending in their home communities.

On an average day during the year, there are 65 visitors in the area who arrived at Camarillo Airport. Some will stay in the Camarillo area for only a few hours while they conduct their business, and others will stay overnight. The average spending by these visitors on a typical day injects $9,148 into the local economy.

Table B17 recaps a summary of current economic benefits associated with the airport. Primary benefits to the service area, without multiplier effects, include revenues of $86.9 million, 427 jobs and earnings to workers and proprietors of $20.7 million.

Camarillo Airport
Daily Economic Benefits

- **$448,000 Revenue Created**
- **830 Local Jobs Supported**
- **$9,148 Visitor Spending**
- **65 Air Visitors**

TABLE B17
Summary of Economic Benefits: 2008
Camarillo Airport

	Revenues	Earnings	Employment
On-Airport Activity	**$83,613,000**	**$19,417,000**	**379**
Air Visitors	**3,339,000**	**1,300,000**	**48**
Primary Benefits	**86,952,000**	**20,717,000**	**427**
Secondary Benefits	**76,648,000**	**19,982,000**	**403**
Total Benefits	**$163,600,000**	**$40,699,000**	**830**

Note: Revenues, earnings and employment benefits reflect activity associated with 140,000 operations.

Including secondary or multiplier effects, total benefits to the service area are $163.6 million in revenues, 830 jobs and earnings of $40.7 million.

Camarillo Airport is the origin of thousands of general aviation trips per year. Corporate and other private aircraft are used to visit other parts of the nation, and to bring visitors, customers and employees to the Camarillo area. The estimated cost of chartering aircraft to serve the business needs of these travelers was found to be $26.5 million. In addition, the presence of the Camarillo Airport provides unmeasured benefits in the form of flexibility in travel not found through reliance on scheduled air carriers.

It is important for citizens and policy makers to be aware that there are significant qualitative benefits from aviation that represent social and economic value created by airports for the regions which they serve. In addition to exerting a positive influence on economic development in general, aviation often reduces costs and increases efficiency in individual firms. Annual studies by the National Business Aviation Association show that those firms with business aircraft have sales 4 to 5 times larger than those that do not operate aircraft. In 2008, the net income of aircraft operating companies was 6 times larger than non-operators (see National Business Aviation Association, *Fact Book*, 2008).

Future Benefits

The service area of Camarillo Airport is located in one of the stronger growth areas of California. Tables B18 through B20 illustrate the future benefits of Camarillo Airport based on short term, intermediate term, and long term operations forecasts. As operations on the airport increase to 152,540, benefits rise from the current level to $176.9 million in the short term. The long term operations level of 136,800 is associated with economic benefits of $228.2 million in revenues, 1,428 jobs supported in the service area, and earnings of workers of $56.7 million.

TABLE B18
Aviation Related Economic Benefits: Short Term (2013) Planning Horizon
Camarillo Airport

	Revenues	Earnings	Employment
On-Airport Benefits	**$84,378,000**	**$17,852,000**	**362**
Visitor Benefits	**3,639,000**	**1,417,000**	**52**
Primary Benefits	**88,017,000**	**19,269,000**	**414**
Secondary Benefits	**88,921,000**	**24,746,000**	**693**
Total Benefits	**$176,938,000**	**$44,015,000**	**1,107**

Note: Revenues, earnings and employment benefits exclude capital projects. Values shown are constant 2008 dollars, and represent airport activity growth to 152,540 operations.

TABLE B19
Aviation Related Economic Benefits: Intermediate Term (2018) Planning Horizon
Camarillo Airport

	Revenues	Earnings	Employment
On-Airport Benefits	**$91,884,000**	**$19,440,000**	**394**
Visitor Benefits	**3,963,000**	**1,543,000**	**57**
Primary Benefits	**95,847,000**	**20,983,000**	**451**
Secondary Benefits	**96,832,000**	**26,947,000**	**755**
Total Benefits	**$192,679,000**	**$47,930,000**	**1,206**

Note: Revenues, earnings and employment benefits exclude capital projects. Values shown are constant 2008 dollars, and represent airport activity growth to 166,110 operations.

TABLE B20
Aviation Related Economic Benefits: Long Term (2028) Planning Horizon
Camarillo Airport

	Revenues	Earnings	Employment
On-Airport Benefits	**$108,821,000**	**$23,023,000**	**467**
Visitor Benefits	**4,694,000**	**1,827,430**	**67**
Primary Benefits	**113,515,000**	**24,850,430**	**534**
Secondary Benefits	**114,681,000**	**31,913,570**	**894**
Total Benefits	**$228,196,000**	**$56,764,000**	**1,428**

Note: Revenues, earnings and employment benefits exclude capital projects. Values shown are constant 2008 dollars, and represent airport activity growth to 196,730 operations.

Tax Impacts

Because of the spending, jobs, and earnings created by the presence of Camarillo Airport, the facility is an important source of public revenues. As airport activity expands, tax revenues will continue to grow.

Estimated tax potential is set out in Table B21. The table shows the revenues for each tax category based on current average tax rates relative to output and personal income (earnings) for Camarillo, Ventura County and California. Federal taxes are applied using current federal rates.

The first column in Table B21 shows tax revenues associated with the current level of airport activity and total economic benefits of $163.6 million. The 830 workers in the service area have taxable earnings of $40.7 million.

Federal social security taxes are estimated at $6.3 million, the largest component of federal taxes. The second largest federal tax category is the personal income tax of $5.2 million. Overall, federal tax revenues currently collected due to economic activity associated with Camarillo Airport are estimated to be $13.9 million.

State and local tax revenues (in the lower portion of the table) sum to $10.3 million for the current level of operations. The largest single component is sales taxes of $3.3 million. Combined federal, state, and local taxes are $24.3 million.

Projected taxes for future airport activity levels are linked to growth rates in airport operations. From $26.5 million for short term activity, total taxes rise to $28.9 million as demand and airport activity rise to higher operations in the intermediate term. In the long term (2028) planning period, total economic benefits related to aviation reach $228.2 million, including all multiplier effects, and taxes are $34.2 million.

TABLE B21
Tax Impacts from On Airport and Visitor Economic Activity
Camarillo Airport

Federal Taxes				
Revenue Category	**Current**	**2013**	**2018**	**2028**
Corporate Profits Tax	**$1,585,000**	**$1,727,000**	**$1,881,000**	**$2,228,000**
Personal Income Tax	**5,233,000**	**5,704,000**	**6,211,000**	**7,356,000**
Social Security Taxes	**6,284,000**	**6,849,000**	**7,459,000**	**8,833,000**
All Other Federal Taxes	**872,000**	**951,000**	**1,035,000**	**1,226,000**
Total Federal Taxes	**$13,974,000**	**$15,231,000**	**$16,586,000**	**$19,643,000**
State and Local Taxes				
Revenue Category	**Current**	**2013**	**2018**	**2028**
Corporate Profits Tax	**$394,000**	**$430,000**	**$468,000**	**$555,000**
Motor Vehicle Taxes	**122,000**	**133,000**	**145,000**	**172,000**
Property Taxes	**2,535,000**	**2,763,000**	**3,009,000**	**3,564,000**
Sales Taxes	**3,258,000**	**3,552,000**	**3,868,000**	**4,580,000**
Personal Income Tax	**1,891,000**	**2,062,000**	**2,245,000**	**2,659,000**
All Other State & Local	**2,140,000**	**2,333,000**	**2,540,000**	**3,009,000**
Total State & Local	**$10,342,000**	**$11,272,000**	**$12,275,000**	**$14,538,000**
Total Taxes	**$24,316,000**	**$26,503,000**	**$28,861,000**	**$34,181,000**

Note: All figures are in 2008 dollars. Derived from average tax rates in Camarillo and Ventura County, California and Federal sources. Current impact estimate based on economic activity associated with 140,000 operations; short term (2013) operations of 152,540; intermediate term (2018) operations of 166,110 and long term (2028) operations of 196,730.

2008 vs. 1995

Table B22 compares current economic benefits with results from the 1995 benefit study. Capital spending outlays have been removed and all figures are in 2008 dollars. The table excludes multiplier effects as well, showing only primary benefits. In the 1995 study, an estimating model developed by Caltrans for airport multiplier analysis was used and that model has not been updated.

On-airport revenues, earnings and employment have doubled in real value since 1995. Visitor spending is lower in 2008. Itinerant operations were actually greater in 1995, and overnight length of stay as reported by GA visitors is shorter now. Overall, however, the conclusion from the comparison is that economic benefits created by Camarillo Airport have grown substantally since 1995.

TABLE B22
Ratio of Economic Benefits: FY 2008 vs. FY 1995
Camarillo Airport

2008	Revenues	Earnings	Employment
On-Airport Activity	**$77,413,000**	**$16,378,000**	**332**
Air Visitors	**3,339,000**	**1,300,000**	**48**
Primary Benefits	**$80,752,000**	**$17,678,000**	**380**
1995 (2008 Dollars)	**Revenues**	**Earnings**	**Employment**
On-Airport Activity	**$37,394,000**	**$7,388,000**	**149**
Air Visitors	**3,962,00**	**1,529,000**	**53**
Primary Benefits	**$41,356,000**	**$8,917,000**	**202**
Ratio 2008/1995	**Revenues**	**Earnings**	**Employment**
On-Airport Activity	**2.07**	**2.22**	**2.23**
Air Visitors	**0.84**	**0.85**	**0.91**
Primary Benefits	**1.95**	**1.98**	**1.88**

Note: All figures expressed in 2008 dollars; capital improvement and construction outlays not included.

APPENDIX C

ENVIRONMENTAL OVERVIEW

Appendix C
ENVIRONMENTAL OVERVIEW

A review of the potential environmental impacts associated with proposed airport projects is an essential consideration in the Airport Master Plan process. The primary purpose of this section is to review the proposed improvement program at Camarillo Airport to determine whether the proposed actions could, individually or collectively, have the potential to significantly affect the quality of the environment. The information contained in this section was obtained from previous studies, various internet websites, and analysis by the consultant.

Construction of any and all improvements depicted on the Airport Layout Plan (ALP) will require compliance with the *National Environmental Policy Act* (NEPA) *of 1969*, as amended. This includes privately funded projects in addition to those projects receiving federal funding. For projects not "categorically excluded" under FAA Order 1050.1E, *Environmental Impacts: Policies and Procedures*, compliance with NEPA is generally satisfied through the preparation of an Environmental Assessment (EA). In instances where significant environmental impacts are expected, an Environmental Impact Statement (EIS) may be required.

In addition, because the airport is located in California, compliance with the *California Environmental Quality Act* (CEQA) is also necessary. CEQA requires consideration of the environmental impacts of the entire airport improvement program prior to local adoption of the master plan. The CEQA process will begin once Ventura County has accepted the Draft Airport Master Plan.

While this portion of the Master Plan is not designed to satisfy the NEPA or CEQA requirements, it is intended to supply a preliminary review of environmental issues that would need to be

analyzed in more detail within the environmental review processes. This evaluation considers all environmental categories required as outlined within FAA Order 1050.1E, *Environmental Impacts, Policies and Procedures* and FAA Order 5050.4B, *National Environmental Policy Act* (NEPA) *Implementation Instructions for Airport Actions.*

The following sections provide a description of the environmental resources which could be impacted by the proposed ultimate airport development depicted on Exhibit 5A. Through a review of previous environmental studies and resource agency websites, it was determined that the following resources are not present within the airport environs or cannot be inventoried:

- Coastal Barriers
- Coastal Zone Management Areas
- Construction Impacts
- Energy Supply, Natural Resources, and Sustainable Design
- Secondary (Induced) Impacts
- Wild and Scenic Rivers

AIR QUALITY

Air quality in a given location is described by the concentrations of various pollutants in the atmosphere. The significance of a pollution concentration is determined by comparing it to the state and federal air quality standards. In 1971, the U.S. Environmental Protection Agency (EPA) established standards that specify the maximum permissible short-term and long-term concentrations of various air contaminants. The National Ambient Air Quality Standards (NAAQS) consist of primary and secondary standards for six criteria pollutants which include: Ozone (O_3), Carbon Monoxide (CO), Sulfur Dioxide (SO_2), Nitrogen Oxide (NO), Particulate matter (PM_{10} and $PM_{2.5}$), and Lead (Pb). Prior to the development of the NAAQS, the California *Clean Air Act* (CAA) established state-specific air quality standards for the same pollutants, plus sulfates, hydrogen sulfide, vinyl chloride, and visibility reducing particulates. In addition, the California CAA identifies stricter standards for the national pollutants.

Based on both federal and state air quality standards, a specific geographic area can be classified under the federal and state CAA as either being in either an “attainment” or “non-attainment” area for each pollutant. The threshold for non-attainment designation varies by pollutant. Camarillo Airport is located in Ventura County, which is included in South Central Coast Air Basin. Ventura County is classified as moderate non-attainment for 8-hour ozone.

During the master plan CEQA process and any future NEPA processes undertaken for projects that increase capacity (i.e., hangar development), an emissions inventory will be needed to determine if the proposed airport improvements will be consistent with the Ventura County Air Quality Management Plan (AQMP). Within the AQMP, air pollutant thresholds have been established. If the proposed improvements do not exceed the established thresholds, the

projects will be considered to have impacts that do not exceed the established thresholds of significance. If the impacts exceed the thresholds, mitigation measures will likely be required.

Furthermore, a number of projects planned at the airport would have temporary air quality impacts during construction. Emissions from the operation of construction vehicles and fugitive dust from pavement removal are common air pollutants during construction. The potential emissions would need to be evaluated as part of any air quality analyses.

SECTION 4(f) RESOURCES

Section 4(f) properties include publicly owned land from a public park, recreational area, or wildlife and waterfowl refuge of national, state, or local significance, or any land from a historic site of national, state, or local significance.

Potential Section 4(f) properties located in proximity to the airport include Freedom Park, located south of the airport, and Spanish Hills Park and Springville Park, both located approximately one mile north of the airport.

None of the proposed airport improvements will result in direct impacts to any of these areas. Additionally, indirect impacts are not anticipated due to the distance between the airport and the parks and recreational areas.

FISH, WILDLIFE, AND PLANTS

Biotic resources include the various types of plants and animals that are present in a particular area. The term also applies to rivers, lakes, wetlands, forests, and other habitat types that support plants, birds, and/or fish. Typically, development in areas such as previously disturbed airport property, populated places, or farmland would result in minimal impacts to biotic resources.

The Fish and Wildlife Service (FWS) and the National Marine Fisheries Service (NMFS) are charged with overseeing the requirements contained within Section 7 of the *Endangered Species Act*. This Act was put into place to protect animal or plant species whose populations are threatened by human activities. Along with the FAA, the FWS and the NMFS review projects to determine if a significant impact to these protected species will result with implementation of a proposed project. Significant impacts occur when the proposed action could jeopardize the continued existence of a protected species or would result in the destruction or adverse modification of federally designated critical habitat in the area

Table C1 depicts federally listed threatened and endangered species and species of special concern listed for Ventura County.

TABLE C1
Threatened and Endangered Species
Ventura County, California

COMMON NAME	SCIENTIFIC NAME	FEDERAL STATUS	STATE STATUS
Plants			
Hoffmann's rock cress	*Arabis hoffmannii*	Endangered	-
Braunton's milk-vetch	*Astragalus brauntonii*	Endangered	-
Ventura Marsh milk-vetch	*Astragalus pycnostachyus var. lanosissimus*	Endangered	Endangered
Island barberry	*Berberis pinnata ssp. Insularis*	Endangered	Endangered
Salt marsh bird's-beak	*Cordylanthus maritimus ssp. Maritimus*	Endangered	Endangered
Island malacothrix	*Malacothrix squalida*	Endangered	-
California Orcutt grass	*Orcuttia californica*	Endangered	Endangered
Lyon's pentachaeta	*Pentachaeta lyonii*	Endangered	Endangered
Agoura Hills dudleya	*Dudleya cymosa ssp. Agourensis*	Threatened	-
Marcescent dudleya	*Dudleya cymosa ssp. Marcescens*	Threatened	Rare
Conejo dudleya	*Dudleya parva*	Threatened	-
Verity's dudleya	*Dudleya verityi*	Threatened	-
Conejo buckwheat	*Eriogonum crocatum*	-	Rare
San Fernando Valley spineflower	*Chorizanthe parryi var. fernandina*	Candidate	Endangered
San Nicolas Island buckwheat	*Eriogonum grande var. timorum*	-	Endangered
Santa Susana tarplant	*Deinandra minthornii*	-	Rare
Trask's milk-vetch	*Astragalus traskiae*	-	Rare
Beach spectacle-pod	*Dithyrea maritima*	-	Threatened
Insects			
Kern primrose sphinx moth	*Euproserpinus euterpe*	Threatened	-
Invertebrates			
Riverside fairy shrimp	*Streptocephalus woottoni*	Endangered	-
Vernal pool fairy shrimp	*Branchinecta lynchi*	Threatened	-
Fish			
Southern steelhead - southern California ESU	*Oncorhynchus mykiss irideus*	Endangered	-
Tidewater goby	*Eucyclogobius newberryi*	Endangered	-
Unarmored threespine stickleback	*Gasterosteus aculeatus williamsoni*	Endangered	Endangered
Santa Ana sucker	*Catostomus santaanae*	Threatened	-
Amphibians			
Arroyo toad	*Bufo californicus*	Endangered	-
Sierra Madre yellow-legged frog	*Rana muscosa*	Endangered	-
California red-legged frog	*Rana draytonii*	Threatened	-
Reptiles			
Blunt-nosed leopard lizard	*Gambelia sila*	Endangered	Endangered
Island night lizard	*Xantusia riversiana*	Threatened	-
Bird			
California condor	*Gymnogyps californianus*	Endangered	Endangered
California brown pelican	*Pelecanus occidentalis californicus*	Endangered	Endangered
Light-footed clapper rail	*Rallus longirostris levipes*	Endangered	Endangered
California least tern	*Sternula antillarum browni*	Endangered	Endangered
Least Bell's vireo	*Vireo bellii pusillus*	Endangered	Endangered
Western snowy plover	*Charadrius alexandrinus nivosus*	Threatened	-
Coastal California gnatcatcher	*Polioptila californica californica*	Threatened	-
Belding's savannah sparrow	*Passerculus sandwichensis beldingi*	-	Threatened
Bank swallow	*Riparia riparia*	-	Threatened
Western yellow-billed cuckoo	*Coccyzus americanus occidentalis*	Candidate	Endangered
Mammals			
Guadalupe fur-seal	*Arctocephalus townsendi*	Threatened	Threatened
Southern sea otter	*Enhydra lutris nereis*	Threatened	-
San Nicolas Island fox	*Urocyon littoralis dickeyi*	-	Threatened

Source: U.S. Fish and Wildlife Service, Ventura County Species List

According to the California Natural Diversity Database (as of April 2009), Verity's dudleya (federal listing: threatened, state listing: none) and Conejo buckwheat (federal listing: none, state listing: rare) have been identified as occurring within the Camarillo USGS quadrangle which includes Camarillo Airport. The Airport is located in an area that includes urbanized disturbed lands that are routinely maintained and agricultural areas. These uses have reduced the potential for the area to contain habitat for federal or state listed species. Previous studies undertaken for the area have determined that no known sensitive habitat is located on airport property.

For the most part, the planned projects at the airport will be undertaken in areas that are regularly maintained for airport uses. The planned construction of hangar areas in the eastern portions of airport property will occur in areas which are not regularly disturbed; therefore, field surveys in these areas may be needed to eliminate the potential occurrence of protected species. Coordination with the U.S. Fish and Wildlife Service and/or the California Department of Fish and Game may be necessary to determine the extent, if any, of field investigations prior to undertaking any of the planned improvements.

FLOODPLAINS

As defined in FAA Order 1050.1E, floodplains consist of "lowland and relatively flat areas adjoining inland and coastal water including flood prone areas of offshore islands, including at a minimum, that area subject to one percent or greater chance of flooding in any given year." Federal agencies are directed to take action to reduce the risk of flood loss, minimize the impact of floods on human safety, health and welfare, and restore and preserve the natural and beneficial values served by floodplains. Floodplains have natural and beneficial values, such as providing ground water recharge, water quality maintenance, fish, wildlife, plants, open space, natural beauty, outdoor recreation, agriculture, and forestry. FAA Order 1050.1E (12) (c) indicates that "if the proposed action and reasonable alternatives are not within the limits of a base floodplain (100-year flood area)," that it may be assumed that there are no floodplain impacts. The limits of base floodplains are determined by Flood Insurance Rate Maps (FIRM) prepared by the Federal Emergency Management Agency (FEMA).

According to the FIRM map (panel number 0650200004B), portions of Camarillo Airport are contained within the 100-year floodplain associated with the Camarillo Hills Drain[1]. Specifically, portions of the planned northeast T-hangar area are located within Zone A4 which is defined as a 100-year floodplain where base flood elevations have not been established. The planned parallel runway and taxiway to be located south of the existing runway are located in Zone B, which indicates the 500-year floodplain. Floodplain maps for the City of Camarillo are in the process of being updated. The preliminary maps available for the City of Camarillo indicate that the revised maps will identify a similar floodplain to the existing maps.[2]

[1] FEMA Map Service Center, http://msc.fema.gov, accessed April 2009
[2] City of Camarillo, http://www.ci.camarillo.ca.us/main.aspx?q=6070&p=9205, accessed May 2009

FARMLAND

The *Farmland Protection Policy Act* (FPPA) was enacted to preserve farmland. FPPA guidelines apply to farmland classified as prime or unique, or of state or local importance as determined by the appropriate government agency, with concurrence by the Secretary of Agriculture. Areas west and south of the airport are used for agricultural purposes; therefore, an evaluation of farmland classifications was undertaken.

According to information obtained from the United States Department of Agriculture's National Resource Conservation Service (NRCS) website, five soil types are present within the immediate vicinity of the airport. Three of the soil types are considered farmlands of statewide importance, one is classified as a prime farmland if irrigated, and one is considered a prime farmland if irrigated and drained. Planned improvements, including the northeastern T-hangar and executive hangar areas, parallel taxiway and parallel runway, are located in areas classified as farmlands of statewide importance. Due to the presence of airport improvements within the vicinity, these areas may be considered urbanized and therefore could be exempt from FPPA requirements. Further coordination with the NRCS may be required prior to undertaking the planned projects.

HAZARDOUS MATERIALS, POLLUTION PREVENTION, AND SOLID WASTE

Federal, state, and local laws regulate hazardous materials use, storage, transport, and disposal. These laws may extend to past and future landowners of properties containing these materials. In addition, disrupting sites containing hazardous materials or contaminates may cause significant impacts to soil, surface water, groundwater, air quality, and the organisms using these resources.

The EPA's *Enviromapper for Envirofacts*[3] was consulted regarding the presence of impaired waters or regulated hazardous sites. No impaired waters are located on or in the vicinity of the airport. According to the site, three hazardous waste sites were identified on the airport. Each of these sites are associated with operations at the airport and are managed by leaseholders. All three sites are located on the south side of the airport and would not be affected by the planned developments outlined in the master plan.

A construction-related National Pollutant Discharge Elimination System (NPDES) permit may be required prior for on-airport construction projects. The permit requires a Notice of Intent for all construction activities disturbing one or more acre of land. In conjunction with the NPDES, a Storm Water Pollution Prevention Plan (SWPPP) may be required to outline the best management practices to be used to minimize impacts to storm water conveyance systems.

[3] http://www.epa.gov/enviro/emef/, Accessed February 2009.

HISTORICAL AND CULTURAL RESOURCES

Determination of a project's impact to historical and cultural resources is made in compliance with the *National Historic Preservation Act* (NHPA) *of 1966*, as amended for federal undertakings. A historic property is defined as any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places (NRHP). Properties or sites having traditional religious or cultural importance to Native American Tribes may also qualify.

According to previous environmental documentation prepared for the airport, no historic, archaeological, or cultural resources have been identified at the airport. Additional coordination with the South Central Coastal Information Center indicated that there are no properties listed on the National Register of Historic Places within the vicinity of the airport.

NOISE

The Community Noise Equivalent Level (CNEL) is accepted by FAA for use in California to assess the extent of aircraft noise within a community. Cumulative noise metrics such as CNEL and the Yearly Day-Night Average Sound Level (DNL) are accepted by the Federal Aviation Administration (FAA), Environmental Protection Agency (EPA), and Department of Housing and Urban Development (HUD) as appropriate measures of noise exposure. These three agencies have each identified the 65 CNEL or DNL noise contour as the threshold of incompatibility. Noise exposure contours are overlaid on maps of existing and planned land uses to determine areas that may be affected by aircraft noise at or above 65 CNEL. The noise exposure contours are developed using the FAA-approved Integrated Noise Model which accepts inputs for several airport characteristics including: aircraft type, operations, flight tracks, time of day, and topography.

For the purposes of this overview, noise contours were prepared for the existing condition and the long range condition with the construction of the parallel runway.

Exhibit C1 depicts the existing (2009) noise condition for Camarillo Airport. As shown on the exhibit, the 65 CNEL noise contour extends off airport property to the north over a light industrial area and parcels devoted to agricultural uses. No noise-sensitive land uses of significance are contained within this contour. **Exhibit C1** also depicts the ultimate condition noise contours. As shown on the exhibit, the noise exposure contours experience a general increase in size due to the forecast increase in operations and the addition of the parallel runway to the south of the primary runway. As with the existing condition, the ultimate noise contours extend off airport property to the north over a light industrial area and parcels used for agriculture. A portion of the noise contour also extends off airport property to the west and south over areas used for agriculture. No noise-sensitive land uses are contained within the long range 65 CNEL noise contour.

06MP19-C1-5/28/09

EXISTING NOISE CONTOURS

Camarillo Hills Drain

Perimeter Road

Ventura Blvd.

65

70

75

75

RUNWAY 8-26 6,013' x 150'

8

26

65 75 70

NORTH

ULTIMATE NOISE CONTOURS

0 800 1600

SCALE IN FEET

Camarillo Hills Drain

Perimeter Road

Ventura Blvd.

65

70

75

75

RUNWAY 8-26 6,013' x 150'

8

26

65 75 70

LEGEND

- Existing Airport Property Line
- Noise Contours

CAMARILLO AIRPORT

Exhibit C1
EXISTING AND ULTIMATE
NOISE CONTOURS

COMPATIBLE LAND USE

The compatibility of existing and planned land uses in the vicinity of an airport is typically associated with the extent of the airport's noise impacts. Noise impacts are generally evaluated by comparing the extent of an airport's noise exposure contours to the land uses within the immediate vicinity of the airport.

A review of the City of Camarillo General Plan, which includes planning guidance for the area surrounding Camarillo Airport, indicates that compatible land uses are planned within the immediate vicinity of the airport. The General Plan land use map indicates that the area north of the airport is planned for industrial, research and development, and office uses. The areas south, east and west are planned for agricultural uses.

LIGHT EMISSIONS AND VISUAL IMPACTS

Airport lighting is characterized as either airfield lighting (i.e., runway, taxiway, approach and landing lights) or landside lighting (i.e., security lights, building interior lighting, parking lights, and signage). Generally, airport lighting does not result in significant impacts unless a high intensity strobe light, such as a Runway End Identifier Light (REIL), would produce glare on any adjoining site, particularly residential uses.

Visual impacts relate to the extent that the proposed development contrasts with the existing environment and whether a jurisdictional agency considers this contrast objectionable. The visual sight of aircraft, aircraft contrails, or aircraft lights at night, particularly at a distance that is not normally intrusive, should not be assumed to constitute an adverse impact.

The planned hangar development projects on the north side of the airport will occur approximately one half mile from existing residential development. If the potential for lighting or visual impacts is determined to be associated with the planned development, consultation with local residents and the owners of light-sensitive sites may be needed to determine possible alternatives to minimize these effects without risking aviation safety or efficiency. Additional coordination with State, regional, or local art or architecture councils, tribes, or other organizations having an interest in airport-associated visual effects may be necessary.

SOCIOECONOMIC IMPACTS, ENVIRONMENTAL JUSTICE, AND CHILDREN'S ENVIRONMENTAL HEALTH AND SAFETY RISKS

Socioeconomic impacts known to result from airport improvements are often associated with relocation activities or other community disruptions, including alterations to surface transportation patterns, division or disruption of existing communities, interferences with orderly planned development, or an appreciable change in employment related to the project.

The acquisition of real property or displacing people or businesses is required to conform to the *Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970* (URARPAPA). These regulations mandate that certain relocation assistance services be made available to owners/tenants of the properties. The airport master plan does not include plans to acquire any property. However the proposed extension of Taxiway F will require the relocation of the Ventura County Sheriff Department's firing range. Coordination with the Sheriff's Department will be necessary. Additionally, a proposed land exchange is being pursued for two parcels on the southern side of the airport. Appropriate environmental documental may be necessary to complete this transaction.

Executive Order 12898, *Federal Action to Address Environmental Justice in Minority Populations and Low-Income Populations,* and the accompanying Presidential Memorandum, and Order DOT 5610.2, *Environmental Justice*, require FAA to provide for meaningful public involvement by minority and low-income populations as well as analysis that identifies and addresses potential impacts on these populations that may be disproportionately high and adverse.

According to the EPA's *Environmental Justice Geographic Assessment Tool*[4], the U.S. Census Bureau block that includes the airport the airport environs do not contain high percentages (above 50 percent) of minority populations or high percentages of residents below the poverty level.

Pursuant to Executive Order 13045, *Protection of Children from Environmental Health Risks and Safety Risks,* federal agencies are directed to identify and assess environmental health and safety risks that may disproportionately affect children. These risks include those that are attributable to products or substances that a child is likely to come in contact with or ingest, such as air, food, drinking water, recreational waters, soil, or products to which they may be exposed.

During construction of the projects outlined within the master plan, appropriate measures should be taken to prevent access by unauthorized persons to construction project areas. Additionally, best management practices should be implemented to decrease environmental health risks to children.

WATER QUALITY

The *Clean Water Act* provides the authority to establish water quality standards, control discharges, develop waste treatment management plans and practices, prevent or minimize the loss of wetlands, and regulate other issues concerning water quality. Water quality concerns related to airport development most often relate to the potential for surface runoff and soil erosion, as well as the storage and handling of fuel, petroleum products, solvents, etc.

Camarillo Airport is located within the Los Angeles Region (Region 4) of the California Regional Water Quality Control Board (RWQCB). The RWQCB issues Federal National Pollutant Discharge

[4] http://www.epa.gov/enviro/ej/. Accessed January 2009.

Elimination System (NPDES) permits for discharge to surface waters. The airport operates in conformance with Section 402(p) of the *Clean Water Act*. Ventura County holds an NPDES Multi-Sector General Permit for stormwater discharges associated with industrial activity and maintains a *Stormwater Pollution Prevention Plan* (SWPPP) in accordance with EPA regulations. Construction of the planned improvements at the airport requires an update of the airport's SWPPP and NPDES.

The EPA's Enviromapper website indicates that there are no impaired streams within the vicinity of the airport, thereby being in violation of established water quality standards.

WETLANDS

The U.S. Army Corps of Engineers (USACE) regulates the discharge of dredge and/or fill material into waters of the United States, including adjacent wetlands, under Section 404 of the *Clean Water Act*.

Wetlands are defined by Executive Order 11990, *Protection of Wetlands*, as "those areas that are inundated by surface or groundwater with a frequency sufficient to support and under normal circumstances does or would support a prevalence of vegetation or aquatic life that requires saturated or seasonally saturated soil conditions for growth and reproduction." Categories of wetlands includes swamps, marshes, bogs, sloughs, potholes, wet meadows, river overflows, mud flats, natural ponds, estuarine area, tidal overflows, and shallow lakes and ponds with emergent vegetation. Wetlands exhibit three characteristics: hydrology, hydrophytes (plants able to tolerate various degrees of flooding or frequent saturation), and poorly drained soils.

The National Wetlands Inventory classifies the Camarillo Hills Drain, located at the northern and western boundaries of the airport, as a riverine wetland.[5] Construction of the T-hangar complex and associated access roads planned for the northeastern portion of the airport may affect this drainage. During the environmental documentation process for this project, consideration should be given to the potential impacts to this drainage.

[5] National Wetlands Inventory, http://www.fws.gov/wetlands/Data/Mapper.html, accessed April 2009

APPENDIX D

AIRPORT LAYOUT PLANS

AIRPORT LAYOUT PLANS

FOR

CAMARILLO AIRPORT

Prepared for

County of Ventura
Department Airports

INDEX OF DRAWINGS

DRAFT

Coffman Associates
Airport Consultants

BUILDINGS/FACILITIES

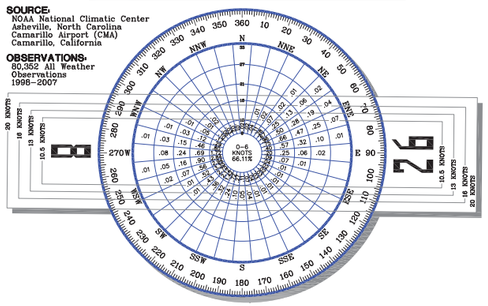
NO.	DESCRIPTION
	EXISTING
1	HANGAR (Sun Air)
2	AIR TRAFFIC CONTROL TOWER (ATCT)
3	FAA OFFICES
4	SELF-SERVICE FUEL ISLAND
5	PUBLIC RESTROOMS
6	T-HANGAR (Nested)
7	T-HANGAR
8	FBO (Avantair)
9	ANIMAL CONTROL FACILITY
10	BOX HANGARS
11	EXPERIMENTAL AIRCRAFT ASSOCIATION HANGARS
12	SELF-MAINTENANCE HANGAR
13	VENTURA COUNTY SHERIFF ACADEMY
14	WORK FURLOUGH
15	HANGARS (C&J Sales)
16	EXECUTIVE HANGAR (Sun Air)
17	EXECUTIVE HANGAR (Sun Air)
18	HANGAR (Fresh Air)
19	FUEL FARM (Sun Air)
20	VENTURA COUNTY SHERIFF FIRING RANGE
21	EXECUTIVE HANGAR
22	FUEL FARM (Ventura County Department of Airports)
23	VENTURA COUNTY FIRE DISTRICT (Communications Center)
24	Civil Air Patrol
119	FBO HANGARS
137	AIRPORT MAINTENANCE FACILITY
149	VENTURA COUNTY FIRE DISTRICT
173	HANGAR 1 (Western Cardinal)
174	HANGAR 2 (Western Cardinal)
209	AIRPORT ADMINISTRATION
212	HANGAR 1 (Channel Islands Aviation)
213	HANGAR 2 (Channel Islands Aviation)
221	OFFICE SPACE
233	WAY POINT CAFE/CHANNEL ISLANDS AVIATION
247	HANGAR 3 (Camarillo Aircraft Service/Ventura County Sheriff Hdq)
252	CORRECTIONAL SERVICES
267	GENERATOR BUILDING
269	WATER PUMP BUILDING
277	COMMUNICATION EQUIPMENT
279	OFFICE SPACE (Ventura Technology)
339	COMMEMORATIVE AIR FORCE
355	FIRE STATION
367	OFFICE SPACE/HANGAR
1020	WATER STORAGE TANK
2007	STANDBY GENERATOR/STORAGE
3004	STORAGE TANK
	ULTIMATE
501	CONVENTIONAL HANGAR
502	EXECUTIVE HANGAR
503	T-HANGAR
504	AVIATION SUPPORT DEVELOPMENT AREA
505	FBO HANGAR
506	FBO HANGAR
507	OFFICE/WAREHOUSE

ALL WEATHER WIND COVERAGE

Runways	10.5 Knots	13 Knots	16 Knots	20 Knots
Runway 8-26	98.27%	99.27%	99.85%	99.96%

SOURCE:
NOAA National Climatic Center
Asheville, North Carolina
Camarillo Airport (CMA)
Camarillo, California

OBSERVATIONS:
80,352 All Weather Observations
1996-2007

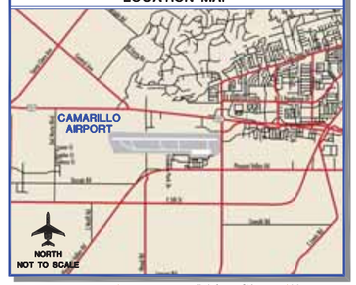


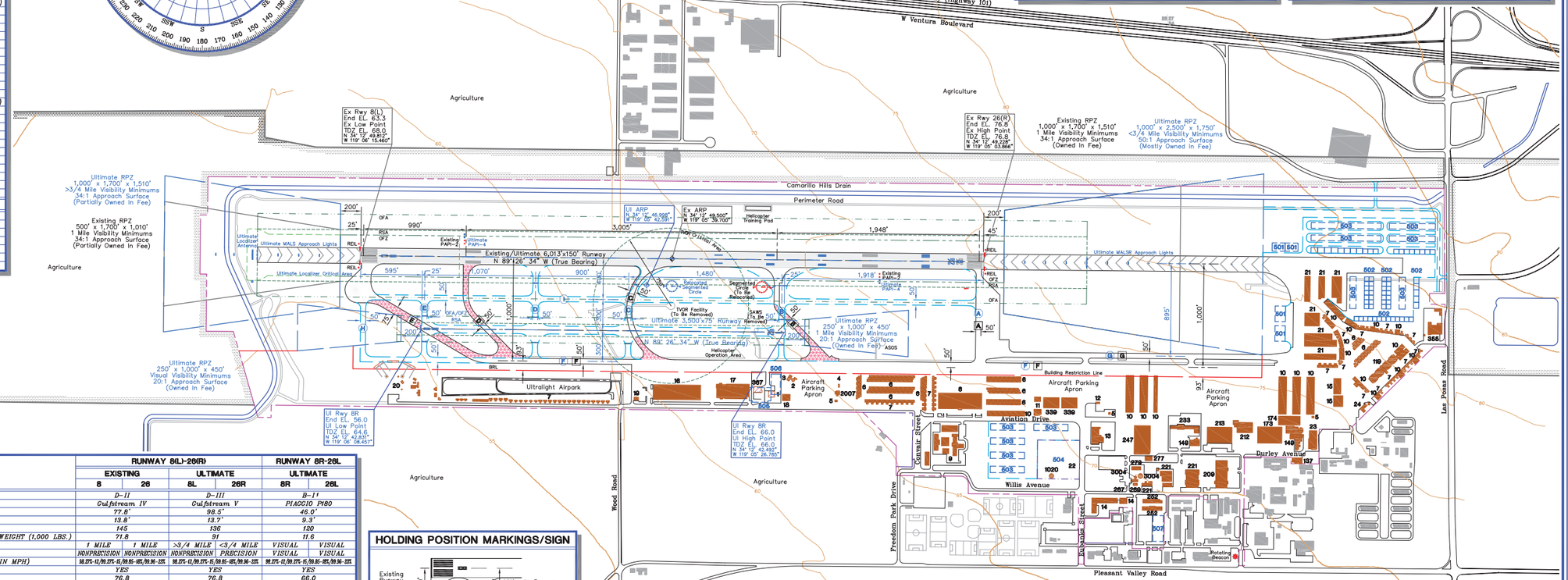
Magnetic Variance
13° 03' East (March 2009)
Annual Rate of Change
00° 05' West (March 2009)

0 500 1,000
SCALE IN FEET

VICINITY MAP

LOCATION MAP



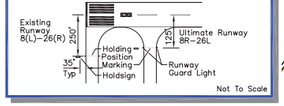


RUNWAY DATA

	RUNWAY 8(L)-26(R)				RUNWAY 8R-26L	
	EXISTING		ULTIMATE		ULTIMATE	
	8	26	8L	26R	8R	26L
AIRCRAFT APPROACH CATEGORY-DESIGN GROUP	D-II		D-III		B-I*	
CRITICAL AIRCRAFT	Gulfstream IV		Gulfstream V		PIAGGIO P180	
CRITICAL AIRCRAFT WINGSPAN	77.8'		98.5'		46.0'	
CRITICAL AIRCRAFT UNDERCARRIAGE WIDTH	13.8'		13.7'		9.3'	
CRITICAL AIRCRAFT APPROACH SPEED (KNOTS)	145		136		120	
CRITICAL AIRCRAFT MAXIMUM CERTIFIED TAKEOFF WEIGHT (1,000 LBS.)	71.6		91		11.1	
APPROACH VISIBILITY MINIMUMS (LOWEST)	1 MILE	1 MILE	>3/4 MILE	<3/4 MILE	VISUAL	VISUAL
F.A.R. PART 77 CATEGORY	NONPRECISION	NONPRECISION	NONPRECISION	PRECISION	VISUAL	VISUAL
PERCENTAGE OF WIND COVERAGE (ALL WEATHER IN MPH)	98.27%-13/99.27%-16/99.85%-16%/99.96%-20%		98.27%-13/99.27%-16/99.85%-16%/99.96%-20%		98.27%-13/99.27%-16/99.85%-16%/99.96%-20%	
LINE OF SIGHT REQUIREMENT MET	YES		YES		YES	
MAXIMUM ELEVATION (ABOVE MSL)	76.8		76.8		66.0	
LOWEST ELEVATION (ABOVE MSL)	63.3		63.3		56.0	
RUNWAY DIMENSIONS	6,013' x 150'		6,013' x 150'		3,500' x 75'	
RUNWAY BEARING (TRUE BEARING - DECIMAL DEGREES)	90.5570	270.5682	90.5570	270.5682	90.5570	270.5682
RUNWAY APPROACH SURFACES (F.A.R. PART 77)	34:1	34:1	34:1	50:1	20:1	20:1
RUNWAY END ELEVATION (NAVD 88)	63.3	76.8	63.3	76.8	56.0	66.0
RUNWAY THRESHOLD DISPLACEMENT	0'	0'	0'	0'	0'	0'
RUNWAY THRESHOLD SITING REQUIREMENTS (APPENDIX 2, CATEGORY)	6	6	8	9	2	2
RUNWAY SAFETY AREA WIDTH (RSA)	500'		500'		120'	
RUNWAY SAFETY AREA (RSA) BEYOND RUNWAY STOP END	1,000'	1,000'	1,000'	1,000'	240'	240'
RUNWAY OBSTACLE FREE ZONE WIDTH (OFZ)	400'		400'		250'	
RUNWAY OBSTACLE FREE ZONE (OFZ) BEYOND RUNWAY STOP END	200'	200'	200'	200'	200'	200'
RUNWAY OBJECT FREE AREA WIDTH (OFA)	800'		800'		250'	
RUNWAY OBJECT FREE AREA (OFA) BEYOND RUNWAY STOP END	1,000'	1,000'	1,000'	1,000'	240'	240'
RUNWAY PAVEMENT SURFACE MATERIAL	ASPHALT		ASPHALT		ASPHALT	
RUNWAY PAVEMENT STRENGTH (IN THOUSAND LBS.)[2]	50(S)/80(D)/125(DT)		50(S)/80(D)/125(DT)		12.5(S)	
RUNWAY EFFECTIVE GRADIENT	0.22%		0.22%		0.29%	
RUNWAY MAXIMUM GRADIENT	0.22%		0.22%		0.29%	
RUNWAY TOUCHDOWN ZONE ELEVATION (ABOVE MSL)	68.0	76.8	68.0	76.8	64.6	66.0
RUNWAY MARKING	NONPRECISION	NONPRECISION	NONPRECISION	PRECISION	BASIC	BASIC
RUNWAY LIGHTING	MIRL		MIRL		NONE	
RUNWAY APPROACH LIGHTING	NONE	NONE	MALS	MALSR	NONE	NONE
RUNWAY TO TAXIWAY SEPARATION (FROM CENTERLINE TO CENTERLINE)	400'		400'		300'	
RUNWAY HOLD LINE POSITION (FROM RUNWAY CENTERLINE)	250'		250'		125'	
TAXIWAY TO TAXILANE SEPARATION (FROM CENTERLINE TO CENTERLINE)	105'		152'		105'	
TAXIWAY CENTERLINE TO FIX OR MOVEABLE OBJECT	65.5'		93'		65.5'	
TAXIWAY LIGHTING	MITL		MITL		NONE	
TAXIWAY MARKING	CENTERLINE/SIGNAGE		CENTERLINE/SIGNAGE		CENTERLINE/SIGNAGE	
TAXIWAY SURFACE MATERIAL	ASPHALT/CONCRETE		ASPHALT/CONCRETE		ASPHALT/CONCRETE	
TAXIWAY WINGTIP CLEARANCE	26'		34'		26'	
TAXIWAY WIDTH	50'		50'		50'	
TAXIWAY SAFETY AREA WIDTH	79'		118'		79'	
TAXIWAY OBJECT FREE AREA WIDTH	131'		186'		131'	
RUNWAY NAVIGATIONAL AIDS	PAPI-2 L REIL RNAV (GPS)	PAPI-2 L REIL RNAV (GPS) Y RNAV (GPS) Z VOR	PAPI-4 L REIL RNAV (GPS)	PAPI-4 L REIL RNAV (GPS) Y RNAV (GPS) Z VOR Localizer		

[1] Runway 8R-26L is for Small Aircraft Exclusively.
[2] Pavement strengths are expressed in Single(S), Dual(D), Dual Tandem(DT) and Double Dual Tandem(DDT) wheel loading capacities.

HOLDING POSITION MARKINGS/SIGN



RUNWAY END COORDINATES (NAD 83)

RUNWAY		EXISTING	ULTIMATE
Runway 8(L)	Latitude	34° 12' 49.812" N	34° 12' 49.812" N
	Longitude	119° 06' 15.460" W	119° 06' 15.460" W
Runway 26(R)	Latitude	34° 12' 49.228" N	34° 12' 49.228" N
	Longitude	119° 05' 03.866" W	119° 05' 03.866" W
Runway 8R	Latitude	N/A	34° 12' 42.831" N
	Longitude	N/A	119° 06' 08.457" W
Runway 26L	Latitude	N/A	34° 12' 42.492" N
	Longitude	N/A	119° 05' 26.785" W

AIRPORT DATA

CAMARILLO AIRPORT (CMA)
CITY: CAMARILLO, CALIFORNIA | COUNTY: VENTURA, CALIFORNIA | RANGE: 21W | TOWNSHIP: 2N

		EXISTING	ULTIMATE
AIRPORT SERVICE LEVEL		GENERAL AVIATION	GENERAL AVIATION
AIRPORT REFERENCE CODE		D-II	D-III
DESIGN AIRCRAFT		Gulfstream IV	Gulfstream V
AIRPORT ELEVATION		76.8 MSL	76.8 MSL
MEAN MAXIMUM TEMPERATURE OF HOTTEST MONTH		75° F (AUGUST)	75° F (AUGUST)
AIRPORT REFERENCE POINT (ARP) COORDINATES (NAD 83)	LATITUDE	34° 12' 49.500" N	34° 12' 46.998" N
	LONGITUDE	119° 05' 39.700" W	119° 05' 42.591" W
AIRPORT AND TERMINAL NAVIGATIONAL AIDS		AIR TRAFFIC CONTROL TOWER LIGHTED WIND CONE ROTATING BEACON VOR	AIR TRAFFIC CONTROL TOWER LIGHTED WIND CONE ROTATING BEACON VOR
GPS APPROACH		8/26	8R/26L

LEGEND

EXISTING	ULTIMATE	DESCRIPTION
		ABANDONED/REMOVED PAVEMENT
		AIRPORT PROPERTY LINE
		AIRPORT PARCEL LINE
		AIRPORT REFERENCE POINT (ARP)
		AIRPORT ROTATING BEACON
		AVIATION EASEMENT (if applicable)
		BUILDING REMOVAL
		BUILDING CONSTRUCTION (On/Off Airport)
BRL	BRL	BUILDING RESTRICTION LINE (BRL)
		FACILITY (PAVEMENT) CONSTRUCTION
		FENCING
		MEDIUM-INTENSITY APPROACH LIGHTING SYSTEM WITH RUNWAY ALIGNMENT INDICATOR (MALSR)
Critical Area	Critical Area	NAVAID CRITICAL AREA (localizer/Glide Slope)
VASI-4	VASI-4	NAVIGATIONAL AID INSTALLATION
PAPI-4	PAPI-4	PRECISION APPROACH PATH INDICATOR
ROFZ	ROFZ	PRECISION OBJECT FREE ZONE
		PRIMARY/SECONDARY AIRPORT CONTROL STATION
OFA	OFA	RUNWAY OBJECT FREE AREA
OFZ	OFZ	RUNWAY OBSTACLE FREE ZONE
		RUNWAY PROTECTION ZONE (RPZ)
RSA	RSA	RUNWAY SAFETY AREA
		RUNWAY END IDENTIFICATION LIGHTS (REIL)
		RUNWAY THRESHOLD LIGHTS
24 30	24 30	SECTION CORNER
		SEGMENTED CIRCLE/WIND INDICATOR
A	A	TAXIWAY DESIGNATION
		TAXIWAY HOLD LINE
1280	1280	TOPOGRAPHY
		WIND INDICATOR (Lighted)

FOR APPROVAL BY:
County of Ventura
Department of Airports
APPROVED BY: ON THE DATE OF:

Mr. Todd McNamee, A.A.E.
Director of Airports

FAA APPROVAL STAMP

GENERAL NOTES:

1. Features and objects, including related elevations and clearances, within the runway are depicted on the INNER PORTION APPROACH SURFACE DRAWINGS.
2. Details concerning terminal improvements are depicted on the TERMINAL AREA DRAWING.
3. Recommended land uses are depicted on the AIRPORT LAND USE DRAWING.
4. All Elevations are in NAVD 88, all Horizontal Coordinates are in NAD 83.
5. No Threshold Siting Surface Object Penetrations.
6. No Obstacle Free Zone (OFZ) Object Penetrations.
7. There are no PAC (Primary Airport Control) or SAC (Secondary Airport Control) Stations located on or near the airport.

NO.	REVISIONS	BY	DATE 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 IN ACCORDANCE WITH THE DOCUMENTS, NOR THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE IN ACCORDANCE WITH APPROPRIATE PUBLIC LAWS."

CAMARILLO AIRPORT (CMA)

AIRPORT LAYOUT PLAN

DRAFT

CAMARILLO, CALIFORNIA

PLANNED BY: Mike W. Dreyfuss
DETAILED BY: Richard A. Lally
APPROVED BY: James M. Harris

May 29, 2009 | SHEET 1 OF 9

Coffman Associates
Airport Consultants

OBSTRUCTION LEGEND

- OBSTRUCTION
- GROUP or MULTIPLE OBSTRUCTIONS
- TOPOGRAPHIC OBSTRUCTION

GENERAL NOTES:

1. Obstructions, clearances, and locations are calculated from ultimate runway and elevations and ultimate approach surfaces, unless otherwise noted.
2. Depiction of features and objects within the primary, transitional, and horizontal Part 77 surfaces, is illustrated on the PART 77 AIRSPACE DRAWING, sheet 2 of these plans.
3. Depiction of features and objects within the outer portion of the approach surfaces, is illustrated on the RUNWAY APPROACH ZONES PROFILES, sheet 3 of these plans.
4. Depiction of features and objects within the inner portion of the approach surfaces, is illustrated on the INNER PORTION OF RUNWAY APPROACH SURFACE DRAWINGS, sheets 4, 5 and 6 of these plans.
5. Distance for road obstructions and clearances reflect a safety clearance of 10' for airport service roads, 15' for noninterstate roads, 17' for interstate roads, and 23' for railroads.
6. Additional obstruction data is illustrated on National Ocean Survey document CMA 880, 1st Edition, 9/08 AIRPORT OBSTRUCTION CHART.

OBSTRUCTION TABLE

Object Description	Object Elevation	Obstructed Part 77 Surface	Surface Elevation	Object Penetration	Proposed Object Disposition
1. TOPOGRAPHIC	390 MSL	HORIZONTAL SURFACE	227 MSL	163'	REQUEST AERONAUTICAL STUDY
2. TREE	368 MSL	HORIZONTAL SURFACE	227 MSL	141'	REQUEST AERONAUTICAL STUDY
3. TREE	441 MSL	HORIZONTAL SURFACE	227 MSL	215'	REQUEST AERONAUTICAL STUDY
4. TREE	348 MSL	HORIZONTAL SURFACE	227 MSL	123'	REQUEST AERONAUTICAL STUDY
5. TREE	350 MSL	HORIZONTAL SURFACE	227 MSL	125'	REQUEST AERONAUTICAL STUDY
6. TREE	351 MSL	HORIZONTAL SURFACE	227 MSL	125'	REQUEST AERONAUTICAL STUDY
7. TREE	347 MSL	HORIZONTAL SURFACE	227 MSL	122'	REQUEST AERONAUTICAL STUDY
8. TREE	515 MSL	CONICAL SURFACE	238 MSL	278'	REQUEST AERONAUTICAL STUDY
9. DOF TOWER	240 MSL	HORIZONTAL SURFACE	227 MSL	13'	REQUEST AERONAUTICAL STUDY
10. TREE	614 MSL	CONICAL SURFACE	370 MSL	244'	REQUEST AERONAUTICAL STUDY
11. TREE	630 MSL	CONICAL SURFACE	386 MSL	234'	REQUEST AERONAUTICAL STUDY
12. TREE	586 MSL	CONICAL SURFACE	335 MSL	251'	REQUEST AERONAUTICAL STUDY
13. TREE	539 MSL	CONICAL SURFACE	299 MSL	227'	REQUEST AERONAUTICAL STUDY
14. TREE	442 MSL	CONICAL SURFACE	380 MSL	62'	REQUEST AERONAUTICAL STUDY
15. TREE	432 MSL	CONICAL SURFACE	380 MSL	52'	REQUEST AERONAUTICAL STUDY
16. TREE	431 MSL	CONICAL SURFACE	396 MSL	35'	REQUEST AERONAUTICAL STUDY
17. TREE	273 MSL	HORIZONTAL SURFACE	227 MSL	50'	REQUEST AERONAUTICAL STUDY
18. TREE	282 MSL	HORIZONTAL SURFACE	227 MSL	55'	REQUEST AERONAUTICAL STUDY
19. TREE	268 MSL	CONICAL SURFACE	233 MSL	35'	REQUEST AERONAUTICAL STUDY
20. FENCE POST	64 MSL	PRIMARY SURFACE	63 MSL	1'	TO BE REMOVED
21. PIPE	70 MSL	PRIMARY SURFACE	61 MSL	9'	TO BE REMOVED
22. DL GN VOR/DME	66 MSL	PRIMARY SURFACE	70 MSL	15'	TO BE REMOVED
23. WINDSOCK	70 MSL	PRIMARY SURFACE	72 MSL	3'	FIX BY FUNCTIONAL PURPOSE
24. WINDSOCK	90 MSL	PRIMARY SURFACE	76 MSL	14'	FIX BY FUNCTIONAL PURPOSE
25. TANK	760 MSL	40:1 APPROACH SURFACE	753 MSL	7'	REQUEST AERONAUTICAL STUDY
26. TOPOGRAPHIC	1173 MSL	40:1 APPROACH SURFACE	1039 MSL	134'	REQUEST AERONAUTICAL STUDY
27. TOPOGRAPHIC	1338 MSL	40:1 APPROACH SURFACE	1054 MSL	284'	REQUEST AERONAUTICAL STUDY
28. TOPOGRAPHIC	1814 MSL	7:1 TRANSITIONAL SURFACE	1310 MSL	504'	REQUEST AERONAUTICAL STUDY
29. TOPOGRAPHIC	1571 MSL	7:1 TRANSITIONAL SURFACE	1475 MSL	96'	REQUEST AERONAUTICAL STUDY
30. DOF TOWER	1310 MSL	40:1 APPROACH SURFACE	1069 MSL	241'	REQUEST AERONAUTICAL STUDY
31. DOF TOWER	440 MSL	HORIZONTAL SURFACE	227 MSL	213'	REQUEST AERONAUTICAL STUDY
32. BUILDING	335 MSL	HORIZONTAL SURFACE	227 MSL	108'	REQUEST AERONAUTICAL STUDY
33. BUILDING	414 MSL	HORIZONTAL SURFACE	227 MSL	187'	REQUEST AERONAUTICAL STUDY

Magnetic Variance
13° 03' East (March 2009)
Annual Rate of Change
00° 09' West (March 2009)

0 3,000 6,000
SCALE IN FEET

NO.	REVISIONS	BY	DATE APP'D.

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CAMARILLO AIRPORT (CMA)

PART 77 AIRSPACE PLAN

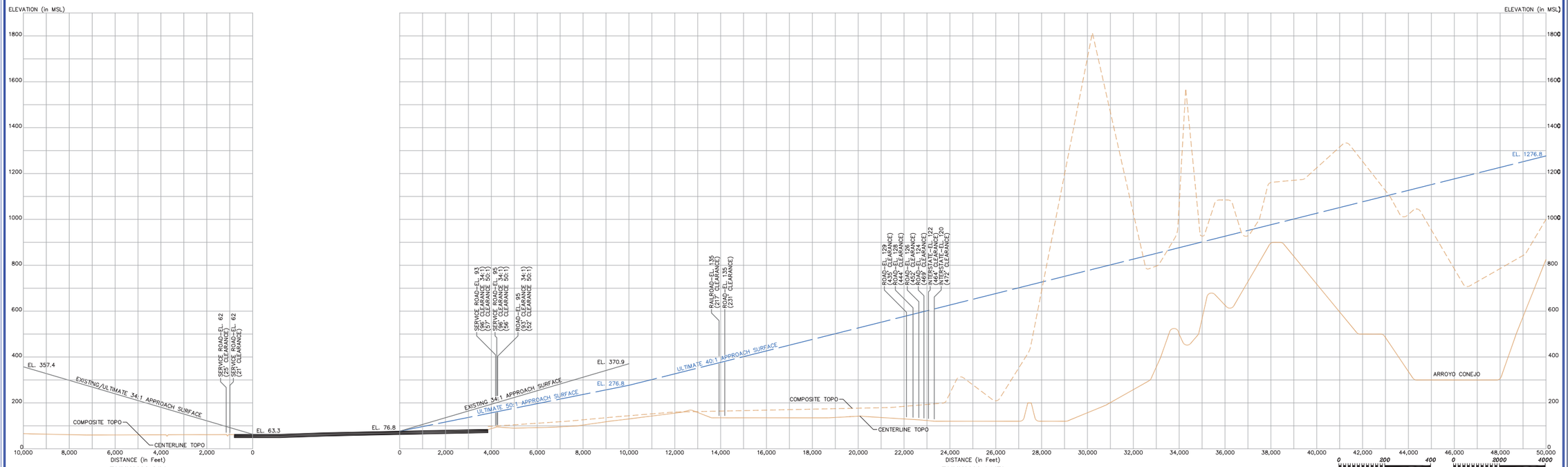
DRAFT

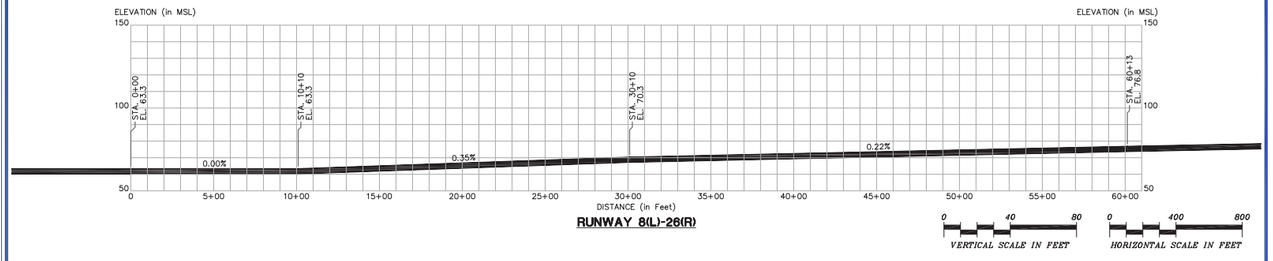
CAMARILLO, CALIFORNIA

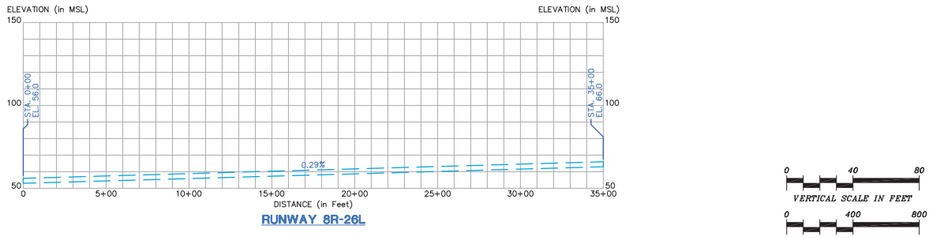
PLANNED BY: Aldo W. Stefanko
DETAILED BY: Richard A. Eddy
APPROVED BY: James D. Kern

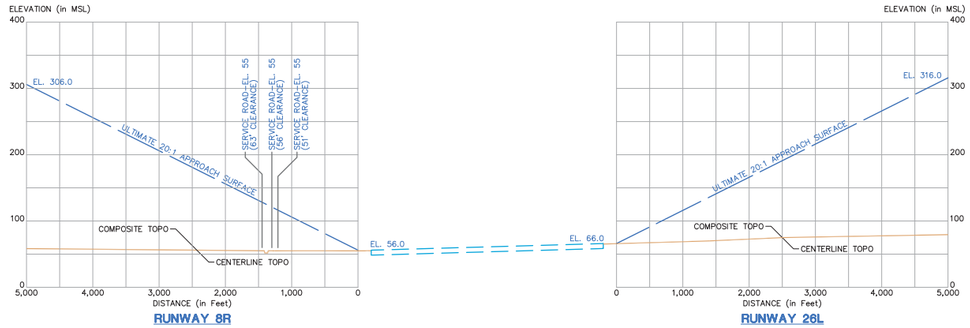
May 19, 2009 | SHEET 2 OF 9

Coffman Associates
Airport Consultants









GENERAL NOTES:

1. Obstructions, clearances, and locations are calculated from ultimate runway end elevations and ultimate approach surfaces, unless otherwise noted.
2. Depiction of features and objects within the primary, transitional, and horizontal Part 77 surfaces, is illustrated on the PART 77 AIRSPACE DRAWING, sheet 2 of these plans.
3. Depiction of features and objects within the outer portion of the approach surfaces, is illustrated on the RUNWAY APPROACH ZONES PROFILES, sheet 3 of these plans.
4. Depiction of features and objects within the inner portion of the approach surfaces, is illustrated on the INNER PORTION OF RUNWAY APPROACH SURFACE DRAWINGS, sheets 4, 5 and 6 of these plans.
5. Distance for road obstructions and clearances reflect a safety clearance of 10' for airport service roads, 15' for noninterstate roads, 17' for interstate roads, and 23' for railroads.
6. Additional obstruction data is illustrated on National Ocean Survey document CMA 680, 1st Edition, 9/88 AIRPORT OBSTRUCTION CHART.

NO.	REVISIONS	BY	DATE APP'D.

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CAMARILLO AIRPORT (CMA)

APPROACH ZONE PROFILES/ RUNWAY PROFILES

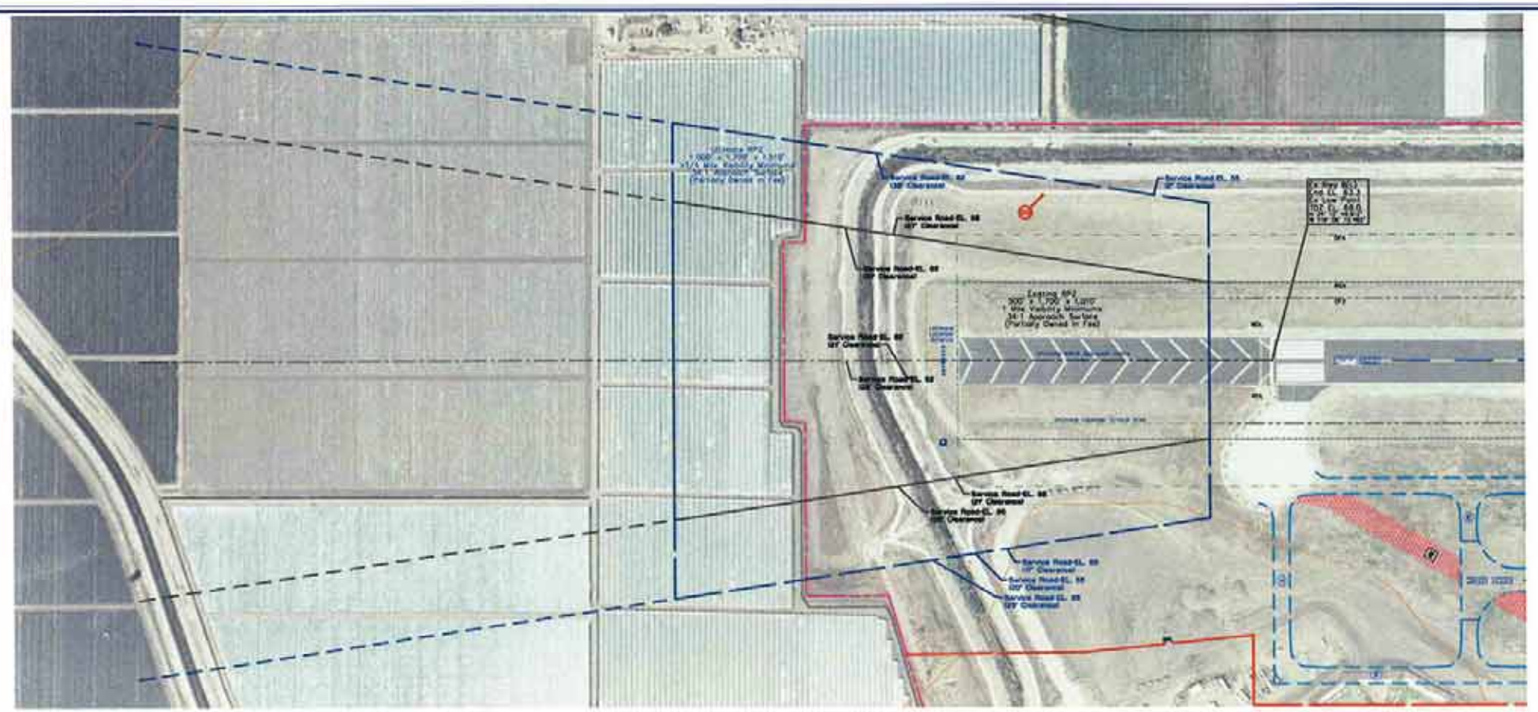
DRAFT

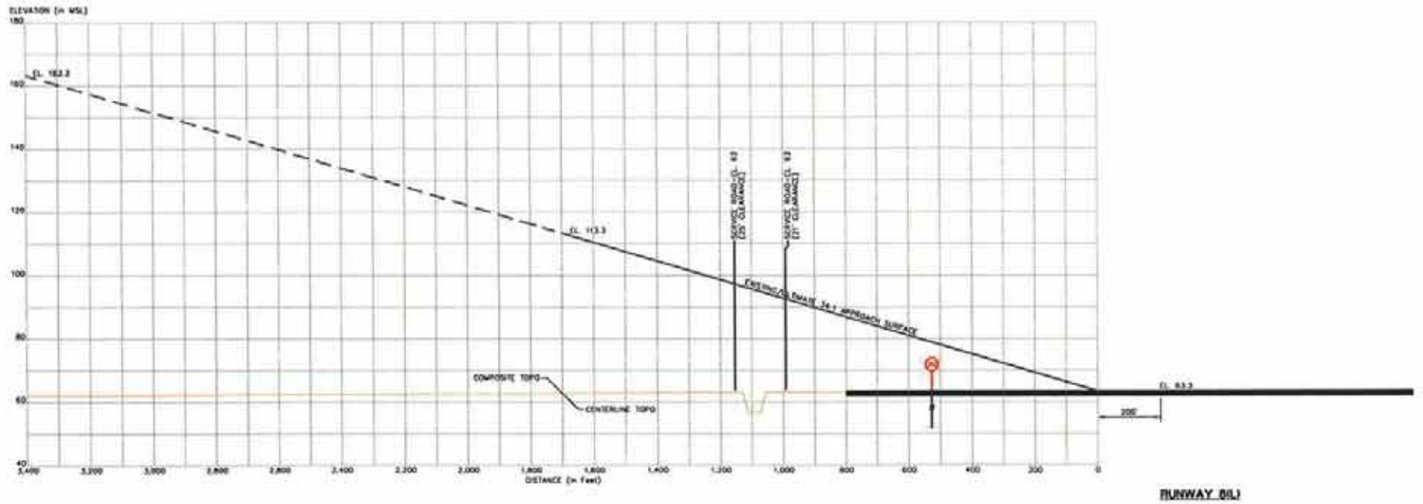
CAMARILLO, CALIFORNIA

PLANNED BY: Mike W. Dmytenko
DETAILED BY: Richard A. Lally
APPROVED BY: James M. Harris

May 29, 2009 | SHEET 3 OF 9

Coffman Associates
Airport Consultants





GENERAL NOTES:

1. Obstructions, clearances, and locations are calculated from ultimate runway end elevations and ultimate approach surfaces, unless otherwise noted.
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4. Depiction of features and objects within the inner portion of the approach surfaces, is illustrated on the INNER PORTION OF RUNWAY APPROACH SURFACE DRAWINGS, sheets 4, 5 and 6 of these plans.
5. Distance for road obstructions and clearances reflect a safety clearance of 10' for airport service roads, 15' for nonintersate roads, 17' for interstate roads, and 23' for railroads.
6. Additional obstruction data is illustrated on National Ocean Survey, document CMA 6982, 1st Edition, 5/88 AIRPORT OBSTRUCTION CHART.

OBSTRUCTION TABLE

Object Description	Object Elevation	Obstructed Part 77 Surface	Surface Elevation	Object Penetration	Proposed Object Disposition
20. FENCE POST	84' MSL	PRIMARY SURFACE	83 MSL	1'	TO BE REMOVED

0 80 40
VERTICAL SCALE IN FEET
0 200 400
HORIZONTAL SCALE IN FEET

NO.	REVISIONS	BY	DATE APP'D.

THE DEPICTION OF NEW OBSTRUCTIONS AND PENETRATIONS OF PART 77 SURFACES IS BASED ON THE BEST INFORMATION AVAILABLE AT THE TIME OF PREPARATION. THE EXISTENCE OF AN OBSTRUCTION OR PENETRATION OF A PART 77 SURFACE IS NOT, IN AND OF ITSELF, A HAZARD TO AIR NAVIGATION. THE ACTUAL HAZARD OR EFFECT OF ANY OBSTRUCTION OR PENETRATION ON AIR NAVIGATION CAN BE DETERMINED ONLY BY AN AERONAUTICAL STUDY. IT IS THE RESPONSIBILITY OF THE SPONSOR TO ENSURE THAT ANY PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE IN ACCORDANCE WITH APPROPRIATE PUBLIC LAWS.

CAMARILLO AIRPORT (CMA)

INNER PORTION OF RUNWAY 8(L) APPROACH SURFACE DRAWING

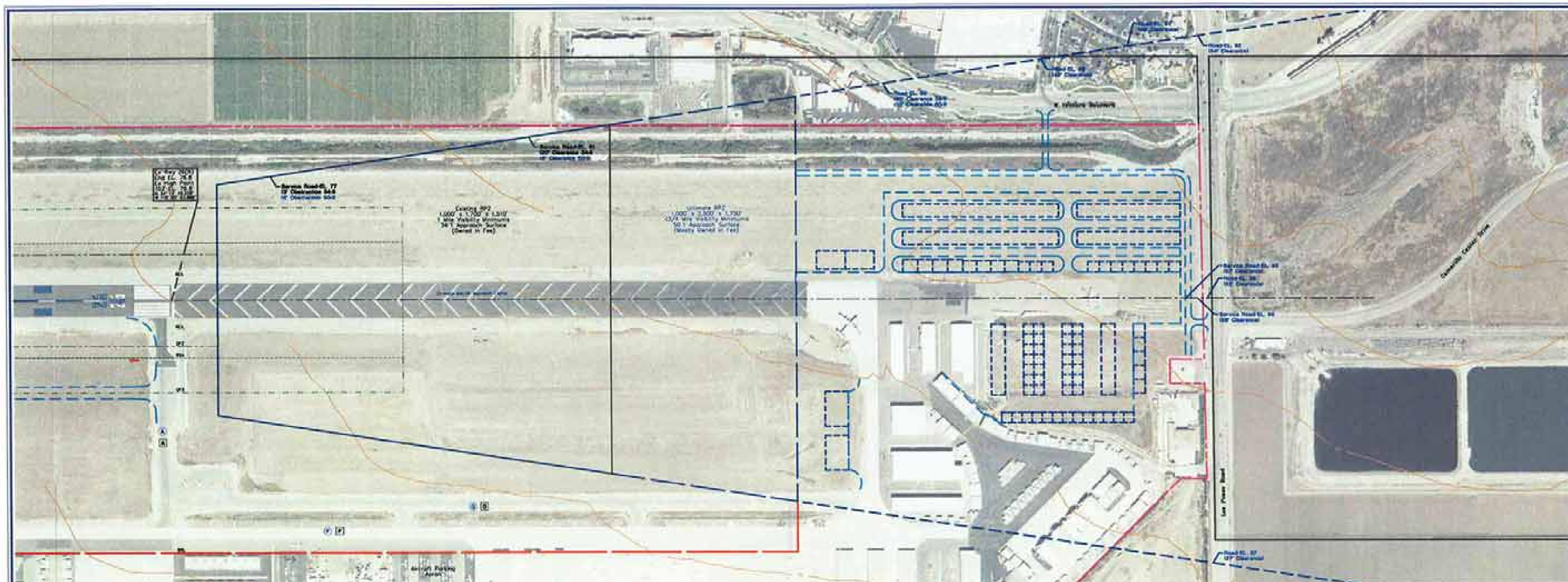
CAMARILLO, CALIFORNIA

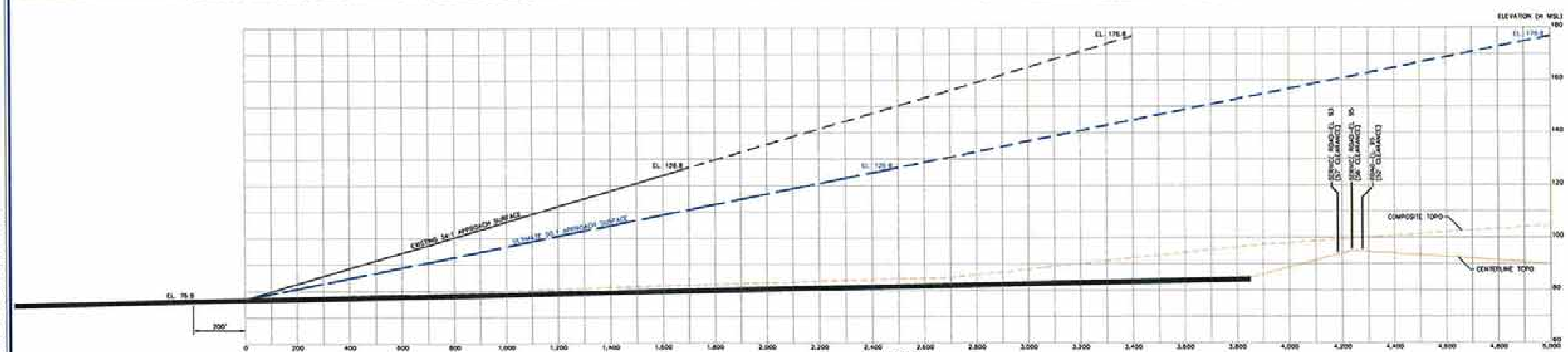
DRAFT

PLANNED BY: Mike W. Stapleton
DETAILED BY: Richard A. Kelly
APPROVED BY: Frances M. Harris

May 29, 2009 SHEET 4 OF 9

Coffman Associates
Airport Consultants





RUNWAY 26(R)

GENERAL NOTES:

1. Obstructions, clearances, and locations are calculated from ultimate runway end elevations and ultimate approach surfaces, unless otherwise noted.
2. Depiction of features and objects within the primary, transitional, and horizontal Part 77 surfaces, is illustrated on the PART 77 AIRSPACE DRAWING, sheet 2 of these plans.
3. Depiction of features and objects within the outer portion of the approach surfaces, is illustrated on the RUNWAY APPROACH ZONE'S PROFILES, sheet 3 of these plans.
4. Depiction of features and objects within the inner portion of the approach surfaces, is illustrated on the INNER PORTION OF RUNWAY APPROACH SURFACE DRAWINGS, sheets 4, 5 and 6 of these plans.
5. Distance for road obstructions and clearances reflect a safety clearance of 10' for airport service roads, 15' for noninterstate roads, 17' for interstate roads, and 23' for railroads.
6. Additional obstruction data is illustrated on National Ocean Survey document CMA 680, 1st Edition, 9/88 AIRPORT OBSTRUCTION CHART.

OBSTRUCTION TABLE

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

VERTICAL SCALE IN FEET (0 – 20 – 40)

HORIZONTAL SCALE IN FEET (0 – 200 – 400)

NO.	REVISIONS	BY	DATE APP'D.

CAMARILLO AIRPORT (CMA)

INNER PORTION OF RUNWAY 26(R) APPROACH SURFACE DRAWING

CAMARILLO, CALIFORNIA

DRAFT

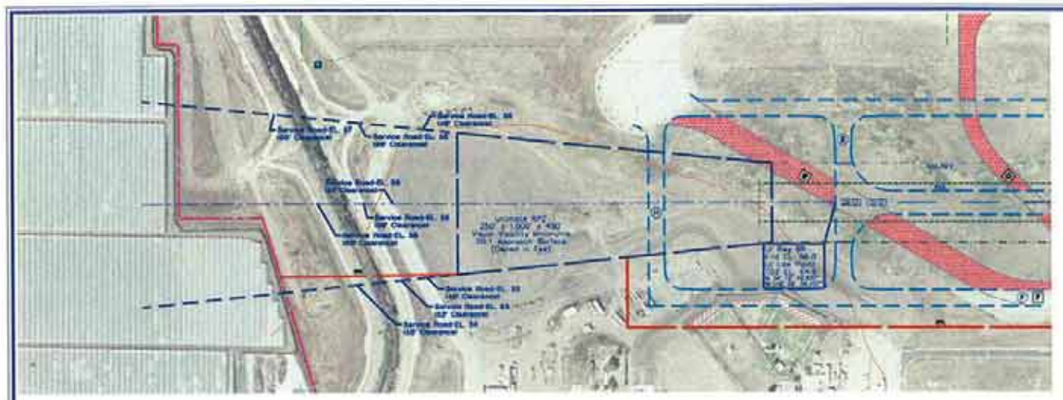
PLANNED BY:

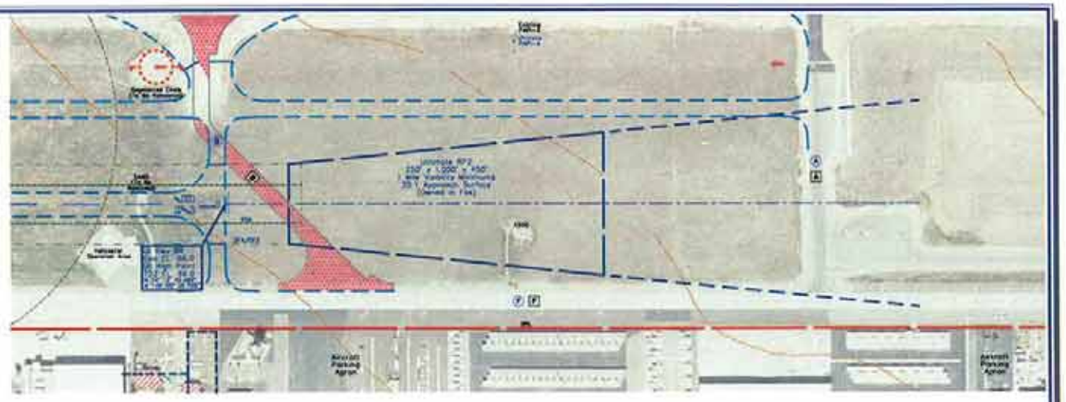
DETAILED BY:

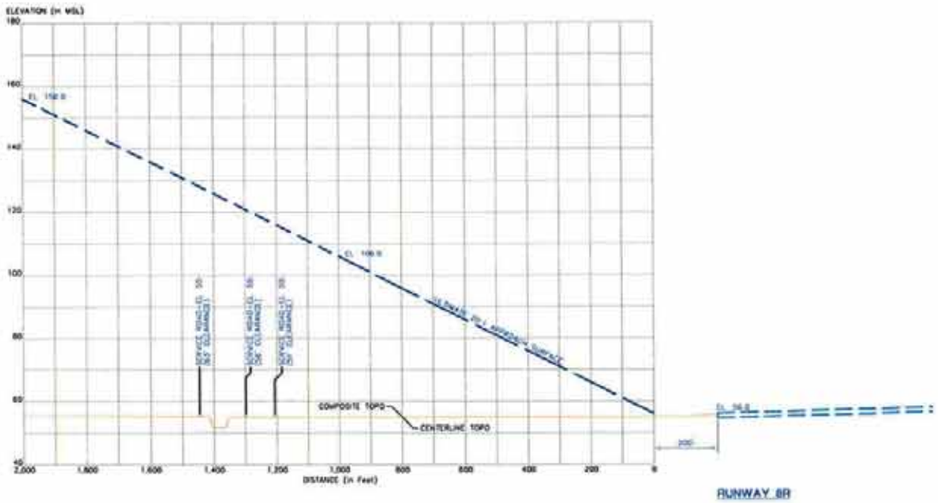
APPROVED BY:

May 29, 2009 — SHEET 5 OF 9

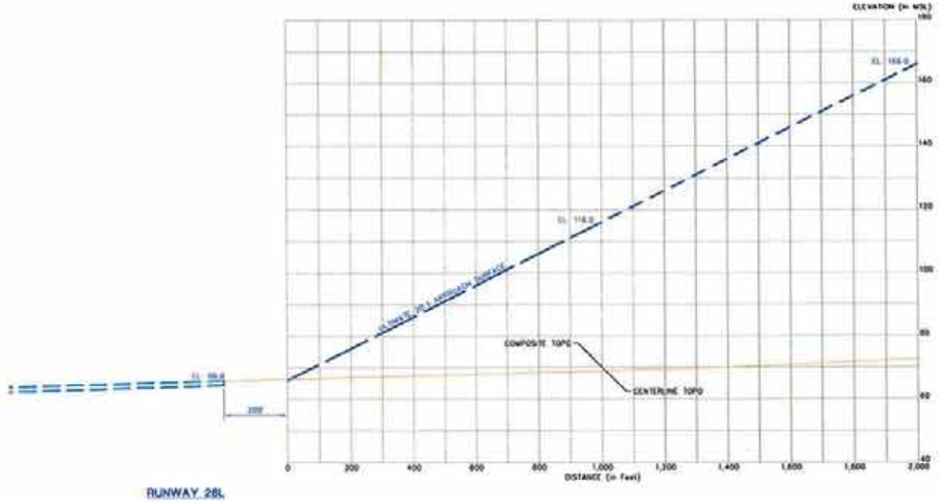
Coffman Associates — Airport Consultants







RUNWAY 8R



RUNWAY 26L

GENERAL NOTES:

1. Obstructions, clearances, and locations are calculated from ultimate runway end elevations and ultimate approach surfaces, unless otherwise noted.
2. Depiction of features and objects within the primary, transitional, and horizontal Part 77 surfaces, is illustrated on the PART 77 AIRSPACE DRAWING, sheet 2 of these plans.
3. Depiction of features and objects within the outer portion of the approach surfaces, is illustrated on the RUNWAY APPROACH ZONES PROFILES, sheet 3 of these plans.
4. Depiction of features and objects within the inner portion of the approach surfaces, is illustrated on the INNER PORTION OF RUNWAY APPROACH SURFACE DRAWINGS, sheets 4, 5 and 6 of these plans.
5. Distance for road obstructions and clearances reflect a safety clearance of 10' for airport service roads, 15' for noninterstate roads, 17' for interstate roads, and 23' for railroads.
6. Additional obstruction data is illustrated on National Ocean Survey, document CHA 5382, 1st Edition, 9/88 AIRPORT OBSTRUCTION CHART.

OBSTRUCTION TABLE

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

VERTICAL SCALE IN FEET: 0, 20, 40

HORIZONTAL SCALE IN FEET: 0, 200, 400

NO.	REVISIONS	BY	DATE APP'D.

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CAMARILLO AIRPORT (CMA)

INNER PORTION OF RUNWAYS 8R-26L APPROACH SURFACES DRAWING

CAMARILLO, CALIFORNIA

DRAFT

PLANNED BY: Mike W. Dingfelder

DETAILED BY: Richard A. Kelly

APPROVED BY: James A. Harris

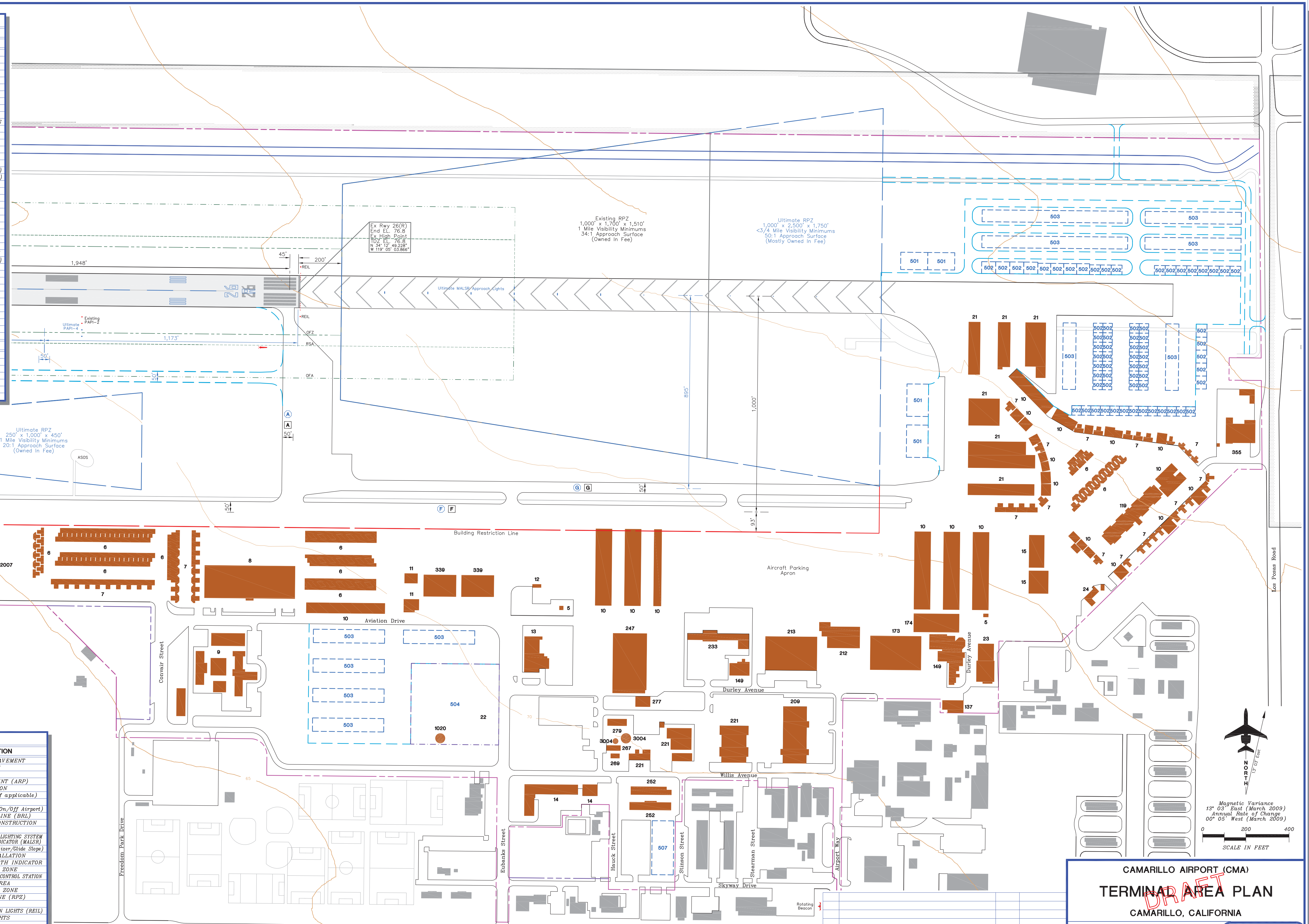
May 29, 2009

SHEET 6 OF 9

Coffman Associates Airport Consultants

BUILDINGS/FACILITIES

NO.	DESCRIPTION
	EXISTING
1	HANGAR (Sun Air)
2	AIR TRAFFIC CONTROL TOWER (ATCT)
3	FAA OFFICES
4	SELF-SERVICE FUEL ISLAND
5	PUBLIC RESTROOMS
6	T-HANGAR (Nested)
7	T-HANGAR
8	FBO (Avantair)
9	ANIMAL CONTROL FACILITY
10	BOX HANGARS
11	EXPERIMENTALL AIRCRAFT ASSOCIATION HANGARS
12	SELF-MAINTENANCE HANGAR
13	VENTURA COUNTY SHERIFF ACADEMY
14	WORK FURLOUGH
15	HANGARS (C&J Sales)
18	HANGAR (Fresh Air)
21	EXECUTIVE HANGAR
22	FUEL FARM (Ventura County Department of Airports)
23	VENTURA COUNTY FIRE DISTRICT (Communications Center)
24	CIVIAL AIR PATROL
119	FBO HANGARS
137	AIRPORT MAINTENANCE FACILITY
149	VENTURA COUNTY FIRE DISTRICT
173	HANGAR 1 (Western Cardinal)
174	HANGAR 2 (Western Cardinal)
209	AIRPORT ADMINISTRATION
212	HANGAR 1 (Channel Islands Aviation)
213	HANGAR 2 (Channel Islands Aviation)
221	OFFICE SPACE
233	WAY POINT CAFE/CHANNEL ISLANDS AVIATION
247	HANGAR 3 (Camarillo Aircraft Service/Ventura County Sheriff Helo)
252	CORRECTIONAL SERVICES
267	GENERATOR BUILDING
269	WATER PUMP BUILDING
277	COMMUNICATION EQUIPMENT
279	OFFICE SPACE (Ventura Technology)
339	COMMEMORATIVE AIR FORCE
355	FIRE STATION
367	OFFICE SPACE/HANGAR
1020	WATER STORAGE TANK
2007	STANDBY GENERATOR/STORAGE
3004	STORAGE TANK
	ULTIMATE
501	CONVENTIONAL HANGAR
502	EXECUTIVE HANGAR
503	T-HANGAR
504	AVIATION SUPPORT DEVELOPMENT AREA
505	FBO HANGAR
506	FBO HANGAR
507	OFFICE/WAREHOUSE



LEGEND

EXISTING	ULTIMATE	DESCRIPTION
		ABANDONED/REMOVED PAVEMENT
		AIRPORT PROPERTY LINE
		AIRPORT PARCEL LINE
		AIRPORT REFERENCE POINT (ARP)
		AIRPORT ROTATING BEACON
		AVIGATION EASEMENT (if applicable)
		BUILDING REMOVAL
		BUILDING CONSTRUCTION (On/Off Airport)
BRL	BRL	BUILDING RESTRICTION LINE (BRL)
		FACILITY (PAVEMENT) CONSTRUCTION
		FENCING
		MEDIUM-INTENSITY APPROACH LIGHTING SYSTEM WITH RUNWAY ALIGNMENT INDICATOR (MALSR)
Critical Area	Critical Area	NAVAID CRITICAL AREA (Localizer/Glide Slope)
VASI-4	VASI-4	NAVIGATIONAL AID INSTALLATION
PAPI-4	PAPI-4	PRECISION APPROACH PATH INDICATOR
xPOFZ	uPOFZ	PRECISION OBJECT FREE ZONE
		PRIMARY/SECONDARY AIRPORT CONTROL STATION
OFA	OFA	RUNWAY OBJECT FREE AREA
OFZ	OFZ	RUNWAY OBSTACLE FREE ZONE
		RUNWAY PROTECTION ZONE (RPZ)
RSA	RSA	RUNWAY SAFETY AREA
		RUNWAY END IDENTIFICATION LIGHTS (REIL)
		RUNWAY THRESHOLD LIGHTS
34|35 3|2	34|35 3|2	SECTION CORNER
		SEGMENTED CIRCLE/WIND INDICATOR
A	B	TAXIWAY DESIGNATION
		TAXIWAY HOLD LINE
1080	1080	TOPOGRAPHY
		WIND INDICATOR (Lighted)

NO.	REVISIONS	BY	DATE 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 OFFICAL 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."

CAMARILLO AIRPORT (CMA)

TERMINAL AREA PLAN

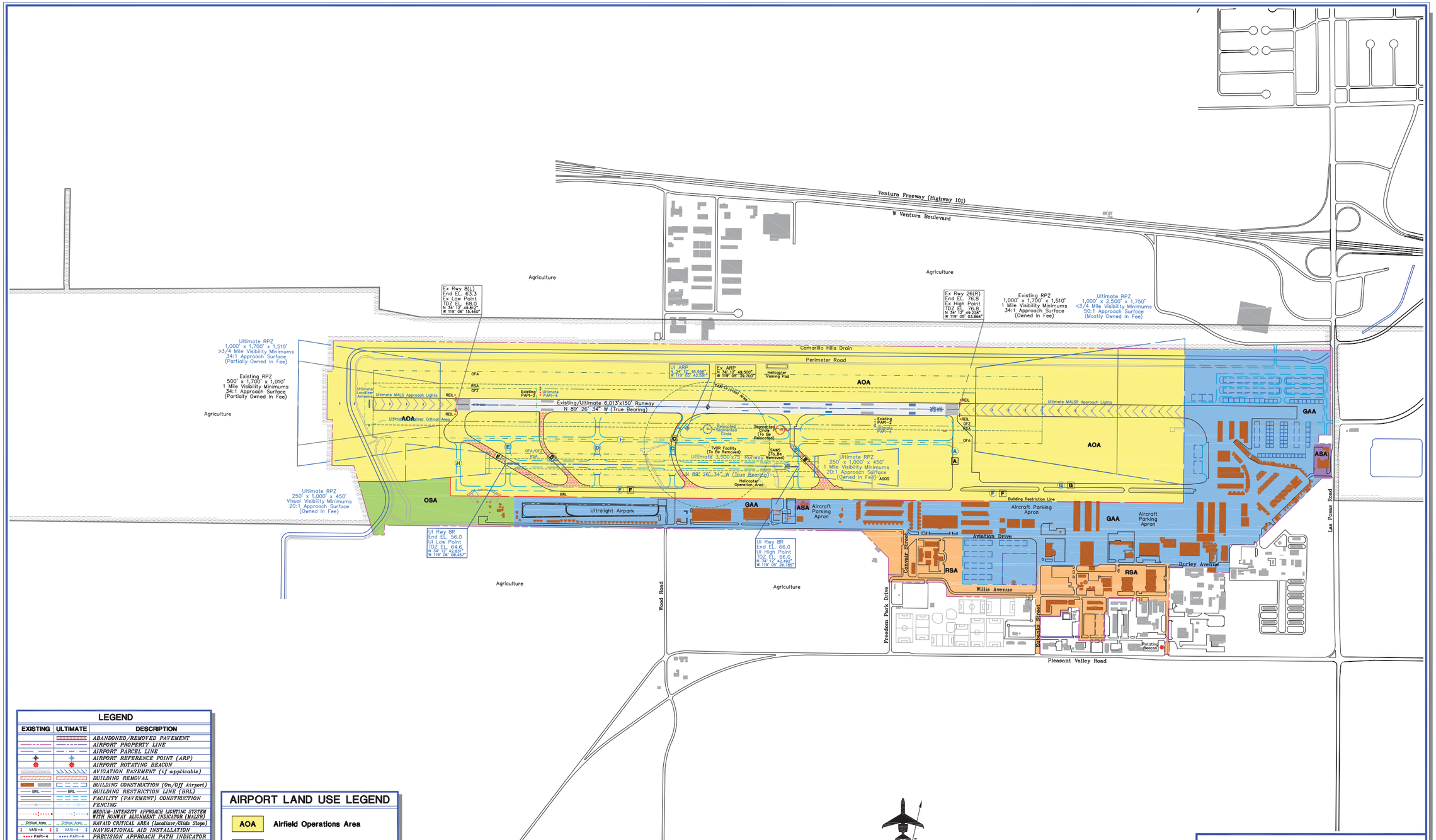
DRAFT

CAMARILLO, CALIFORNIA

PLANNED BY: Mike W. Dmyterko
DETAILED BY: Richard A. Lally
APPROVED BY: James M. Harris

May 29, 2009 SHEET 7 OF 9

Coffman Associates Airport Consultants



LEGEND

EXISTING	ULTIMATE	DESCRIPTION
		ABANDONED/REMOVED PAVEMENT
		AIRPORT PROPERTY LINE
		AIRPORT PARCEL LINE
		AIRPORT REFERENCE POINT (ARP)
		AIRPORT ROTATING BEACON
		AVIGATION EASEMENT (if applicable)
		BUILDING REMOVAL
		BUILDING CONSTRUCTION (On/Off Airport)
BRL	BRL	BUILDING RESTRICTION LINE (BRL)
		FACILITY (PAVEMENT) CONSTRUCTION
		FENCING
		MEDIUM-INTENSITY APPROACH LIGHTING SYSTEM WITH RUNWAY ALIGNMENT INDICATOR (MALSR)
Critical Area	Critical Area	NAVAID CRITICAL AREA (Localizer/Glide Slope)
VASI-4	VASI-4	NAVIGATIONAL AID INSTALLATION
PAPI-4	PAPI-4	PRECISION APPROACH PATH INDICATOR
		PRECISION OBJECT FREE ZONE
		PRIMARY/SECONDARY AIRPORT CONTROL STATION
OFA	OFA	RUNWAY OBJECT FREE AREA
OFZ	OFZ	RUNWAY OBSTACLE FREE ZONE
		RUNWAY PROTECTION ZONE (RPZ)
RSA	RSA	RUNWAY SAFETY AREA
		RUNWAY END IDENTIFICATION LIGHTS (REIL)
		RUNWAY THRESHOLD LIGHTS
30.20	30.20	SECTION CORNER
		SEGMENTED CIRCLE/WIND INDICATOR
A	A	TAXIWAY DESIGNATION
		TAXIWAY HOLD LINE
1080	1080	TOPOGRAPHY
		WIND INDICATOR (Lighted)

AIRPORT LAND USE LEGEND

AOA	Airfield Operations Area
GAA	General Aviation Area
ASA	Airport Support Area
RSA	Revenue Support Area
OSA	Open Space/Agriculture

NORTH

Magnetic Variance
13° 03' East (March 2009)
Annual Rate of Change
00° 05' West (March 2009)

0 500 1,000
SCALE IN FEET

NO.	REVISIONS	BY	DATE 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."

CAMARILLO AIRPORT (CMA)

AIRPORT LAND USE PLAN

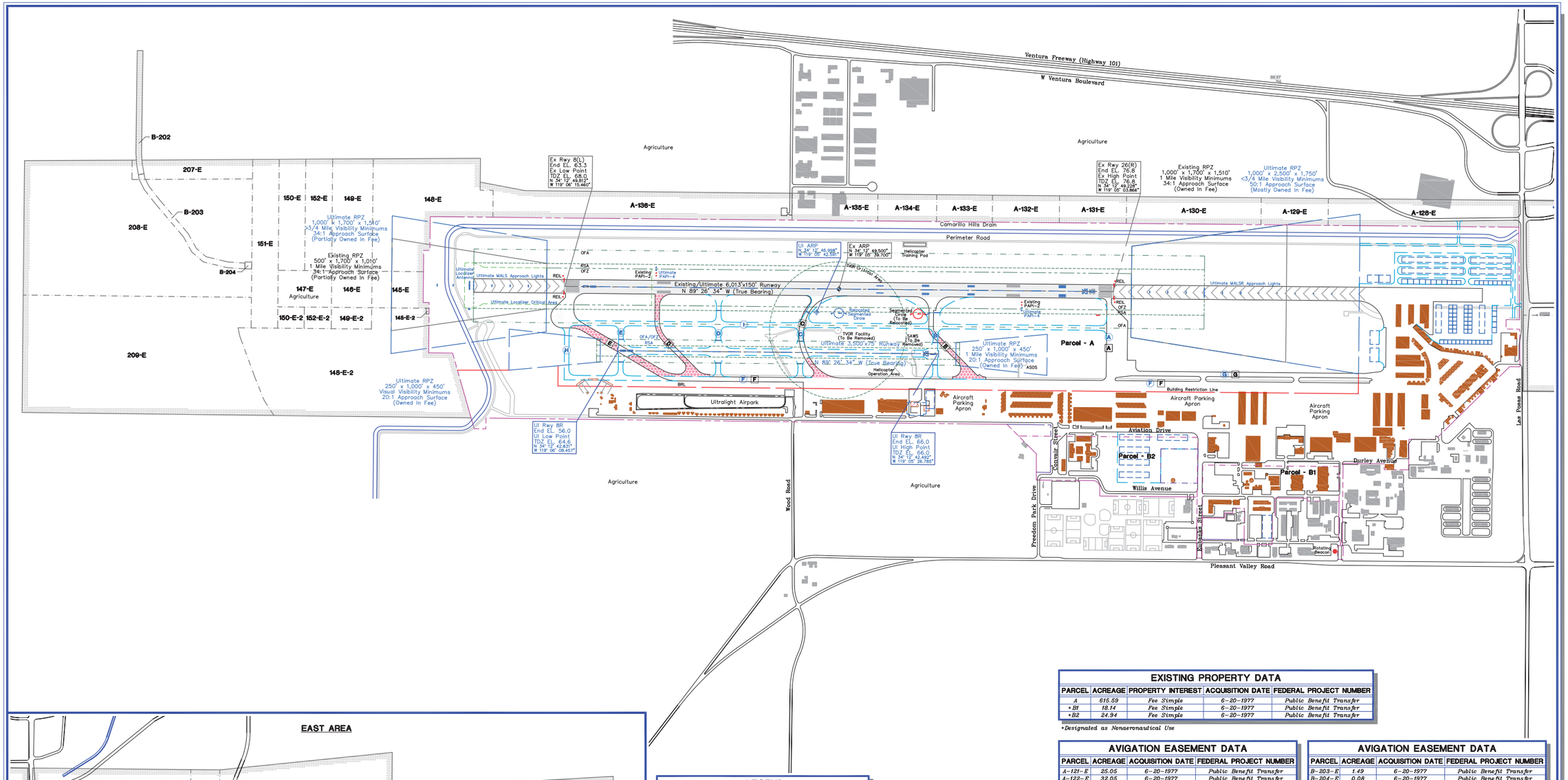
DRAFT

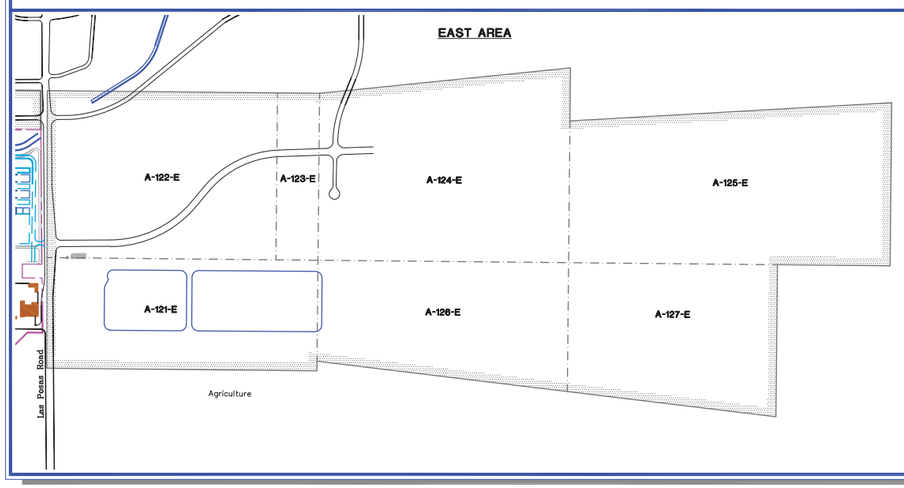
CAMARILLO, CALIFORNIA

PLANNED BY: Mike W. Dreyfoke
DETAILED BY: Richard A. Lally
APPROVED BY: James M. Harris

May 29, 2009 | SHEET 8 OF 9

Coffman Associates
Airport Consultants





LEGEND

EXISTING	ULTIMATE	DESCRIPTION
		ABANDONED/REMOVED PAVEMENT
		AIRPORT PROPERTY LINE
		AIRPORT PARCEL LINE
		AIRPORT REFERENCE POINT (ARP)
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		AVIGATION EASEMENT (if applicable)
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		FENCING
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		PRIMARY/SECONDARY AIRPORT CONTROL STATION
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OFZ	OFZ	RUNWAY OBSTACLE FREE ZONE
		RUNWAY PROTECTION ZONE (RPZ)
RSA	RSA	RUNWAY SAFETY AREA
		RUNWAY END IDENTIFICATION LIGHTS (REIL)
		RUNWAY THRESHOLD LIGHTS
34 26	34 26	SECTION CORNER
		SEGMENTED CIRCLE/WIND INDICATOR
A	A	TAXIWAY DESIGNATION
		TAXIWAY HOLD LINE
1080	1080	TOPOGRAPHY
		WIND INDICATOR (Lighted)

Magnetic Variance
13° 03' East (March 2009)
Annual Rate of Change
00° 05' West (March 2009)

0 600 1,200
SCALE IN FEET

EXISTING PROPERTY DATA

PARCEL	ACREAGE	PROPERTY INTEREST	ACQUISITION DATE	FEDERAL PROJECT NUMBER
A	615.59	Fee Simple	6-20-1977	Public Benefit Transfer
*B1	18.14	Fee Simple	6-20-1977	Public Benefit Transfer
*B2	24.94	Fee Simple	6-20-1977	Public Benefit Transfer

*Designated as Nonaeronautical Use

AVIGATION EASEMENT DATA

PARCEL	ACREAGE	ACQUISITION DATE	FEDERAL PROJECT NUMBER
A-121-E	25.05	6-20-1977	Public Benefit Transfer
A-122-E	32.05	6-20-1977	Public Benefit Transfer
A-123-E	5.87	6-20-1977	Public Benefit Transfer
A-124-E	37.87	6-20-1977	Public Benefit Transfer
A-125-E	40.95	6-20-1977	Public Benefit Transfer
A-126-E	24.06	6-20-1977	Public Benefit Transfer
A-127-E	24.50	6-20-1977	Public Benefit Transfer
A-128-E	16.78	6-20-1977	Public Benefit Transfer
A-129-E	5.91	6-20-1977	Public Benefit Transfer
A-130-E	11.87	6-20-1977	Public Benefit Transfer
A-131-E	5.91	6-20-1977	Public Benefit Transfer
A-132-E	5.91	6-20-1977	Public Benefit Transfer
A-133-E	4.92	6-20-1977	Public Benefit Transfer
A-134-E	5.18	6-20-1977	Public Benefit Transfer
A-135-E	7.55	6-20-1977	Public Benefit Transfer
A-136-E	26.86	6-20-1977	Public Benefit Transfer
A-136-E	26.86	6-20-1977	Public Benefit Transfer
B-202-E	1.25	6-20-1977	Public Benefit Transfer

AVIGATION EASEMENT DATA

PARCEL	ACREAGE	ACQUISITION DATE	FEDERAL PROJECT NUMBER
B-203-E	1.49	6-20-1977	Public Benefit Transfer
B-204-E	0.08	6-20-1977	Public Benefit Transfer
145-E	3.59	6-20-1977	Public Benefit Transfer
145-E-2	0.03	6-20-1977	Public Benefit Transfer
146-E	2.60	6-20-1977	Public Benefit Transfer
147-E	3.45	6-20-1977	Public Benefit Transfer
148-E	17.96	6-20-1977	Public Benefit Transfer
148-E-2	33.03	6-20-1977	Public Benefit Transfer
149-E	8.02	6-20-1977	Public Benefit Transfer
149-E-2	1.52	6-20-1977	Public Benefit Transfer
150-E	5.20	6-20-1977	Public Benefit Transfer
150-E-2	1.00	6-20-1977	Public Benefit Transfer
151-E	7.89	6-20-1977	Public Benefit Transfer
152-E	5.32	6-20-1977	Public Benefit Transfer
152-E-2	1.02	6-20-1977	Public Benefit Transfer
207-E	4.14	6-20-1977	Public Benefit Transfer
208-E	50.74	6-20-1977	Public Benefit Transfer
209-E	47.95	6-20-1977	Public Benefit Transfer

NO.	REVISIONS	BY	DATE APP'D.

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CAMARILLO AIRPORT (CMA)

AIRPORT PROPERTY MAP

DRAFT

CAMARILLO, CALIFORNIA

PLANNED BY: Mike W. Dmytenko
DETAILED BY: Richard A. Lally
APPROVED BY: James M. Harris

May 29, 2009 SHEET 9 OF 9

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