



Chapter 4

Market Assessment





Chapter 4 Market Assessment

INTRODUCTION

This chapter presents market assessments of general aviation and enplaned passengers at Merced Municipal Airport, and translates the assessment into aviation demand forecasts. Prudent planning for the physical development of an airport requires a well-documented forecast of aviation activity at the subject facility. Once the forecasting tasks of the planning process have been completed, the airport planner can then translate the projected activity levels into required facilities. The forecast then serves as a basis for determining the phased development of the facility components for the short, intermediate and long-range planning periods.

The market assessments and forecasts developed for this study cover the period between 2004 and 2026, with intermediate year forecasts presented for the years 2011 and 2016. It is important to note that the forecasts presented herein represent unconstrained potential or "market-driven" demand, without consideration of the physical, safety, noise, regulatory, institutional, or political constraints that may preclude development of facilities to fully serve the demand.

The market assessment has been prepared for general aviation and schedule air service. The general aviation market assessment focused on based aircraft and the scheduled service analysis analyzed enplaned passengers. The results of these assessments were then utilized in the development of projections of aircraft operations.

It is also important to note that due to the uncertainties in the long-range aviation outlook, long-term forecasting is approximate in nature. However, an indication of trends is important since estimates can be made of facility costs, social costs and environmental impacts, which an airport creates on the surrounding area. Thus, the purpose of the forecasting effort is to identify activity levels, which then serve as planning tools.

MARKET ASSESSMENT FOR BASED AIRCRAFT

A based aircraft is one that is permanently stationed at an airport, usually by some form of agreement between the aircraft owner and airport management. This forecast value is used in developing projections of aircraft activity, as well as determining facility requirements for airport elements such as aprons and hangars.

The approach used to forecast based aircraft at Merced involved the following steps: (i) project total based aircraft in the Merced Competitive Market Area (CMA); (ii) forecast the share of based aircraft in the CMA served at Merced considering both supply (competitive airports) and demand factors; (iii) project the fleet mix of aircraft based at Merced. The methodology and assumptions used in each step are described below.

Total Based Aircraft in Merced Competitive Market Area

The number of based aircraft in Merced, Madera, Mariposa and Stanislaus Counties increased from 552 in 1980 to 623 in 2004.

Merced Municipal Airport is located in the City of Merced and competes as a location for based aircraft with other public use airports in a four county area including Merced, Madera, Mariposa, and Stanislaus. Other public use airports in the CMA include Castle, Chowchilla, Gustine, Los Banos, Madera, Mariposa, Modesto, and Turlock. The CMA for Merced is depicted in Figure 4-1.

Over past 24 years (1980 to 2004), based aircraft in the CMA increased by an average of 0.5 percent per year, from 552 in 1980 to 623 in 2004 (see Table 4-1). Annual changes in the number of based aircraft in the CMA were variable with some years experiencing increases and others experiencing declines. Over the period 1980 to 2004 the rate of change in the number of based aircraft in the CMA generally mirrors the rate of change in the overall California market and has been slower than in the United States as a whole.

The 623 based aircraft represent 69 percent of the 908 aircraft registered in the CMA. The 908 registered aircraft represent 2.4 percent of the 37,581 aircraft registered in California, a ratio similar to the ratio of based aircraft in the CMA to California. Aircraft registration data also includes information on the type of ownership, i.e., corporate, government, individual, partnerships, etc. Based on registration data, approximately 18 percent of the aircraft in the CMA are registered to corporations, one percent are registered to government entities (police, fire, special districts, etc.), and 81 percent are registered to individuals, partnerships, and co-owners, as follows:

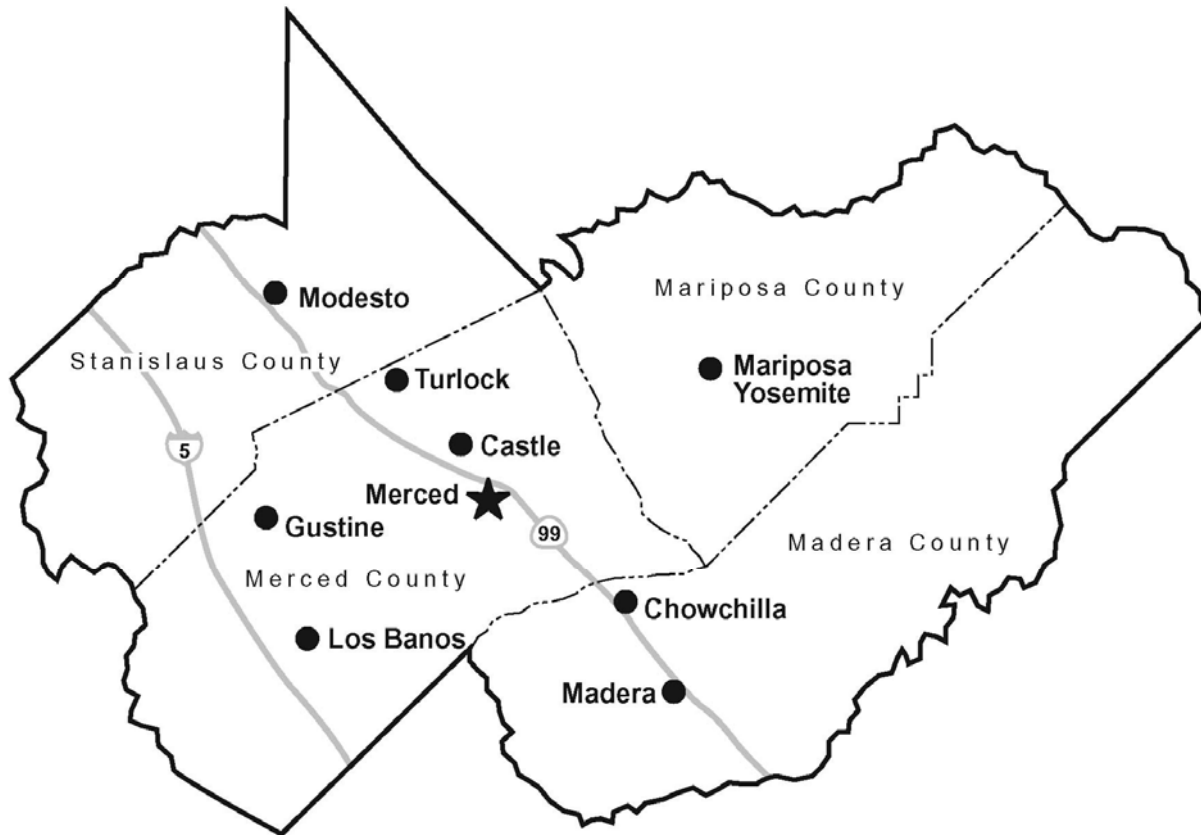
County	Other ¹	Corp.	Govt.	Total
Merced	198	57	6	261
Madera	116	38	1	155
Mariposa	39	3	-	42
Stanislaus	381	63	6	450
Total	734	161	13	908
% Total	81%	18%	1%	100%

¹ Includes individual, partnerships, and co-owners.

A review of the companies with aircraft registered in the CMA indicates that an estimated 40 of the 161 corporate registrations are companies providing agricultural crop dusting services. Therefore, the registration information shows that the majority of the market for based aircraft in the CMA (over 80 percent) is generated by non-corporate or non-government activity. Approximately 13 percent is related to general corporate activity, 4 percent is related to agricultural services, and one percent is related to government.

Factors Affecting Based Aircraft Demand

Future demand for general aviation aircraft locating at airports in the CMA will be driven by a variety of factors, discussed below.



**Figure 4-1
Merced Municipal Airport
General Aviation Based Aircraft
Competitive Market Area**

**Table 4-1
 BASED AIRCRAFT IN THE MERCED MUNICIPAL AIRPORT
 CMA, CALIFORNIA AND UNITED STATES 1980 -2004**

Year	CMA	California	US	California	US
	Based Aircraft			CMA as % of:	
1980	552	26,011	134,848	2.12%	0.41%
1981	594	26,240	139,915	2.26%	0.42%
1982	622	26,315	143,318	2.36%	0.43%
1983	575	26,950	147,042	2.13%	0.39%
1984	575	27,208	149,845	2.11%	0.38%
1985	601	29,400	167,380	2.04%	0.36%
1986	599	28,486	166,558	2.10%	0.36%
1987	592	29,770	168,162	1.99%	0.35%
1988	588	29,247	162,637	2.01%	0.36%
1989	604	30,499	170,021	1.98%	0.36%
1990	564	30,611	169,488	1.84%	0.33%
1991	581	29,226	166,680	1.99%	0.35%
1992	575	29,006	165,921	1.98%	0.35%
1993	575	29,006	161,456	1.98%	0.36%
1994	573	26,749	162,732	2.14%	0.35%
1995	584	27,206	165,022	2.15%	0.35%
1996	595	27,989	167,320	2.13%	0.36%
1997	604	27,750	175,591	2.18%	0.34%
1998	604	27,735	182,135	2.18%	0.33%
1999	614	27,499	183,947	2.23%	0.33%
2000	614	27,843	187,766	2.21%	0.33%
2001	615	28,378	195,534	2.17%	0.31%
2002	615	28,423	196,869	2.16%	0.31%
2003	618	28,620	198,220	2.16%	0.31%
2004	623	28,847	200,243	2.16%	0.31%
Average Annual % Change					
1980-1990	0.2%	1.6%	2.3%	-1.4%	-2.0%
1991-2000	0.6%	-0.5%	1.3%	1.2%	-0.7%
2001-2004	0.4%	0.5%	0.8%	-0.1%	-0.4%
1980-2004	0.5%	0.4%	1.7%	0.1%	-1.1%

Source: FAA 2004 Terminal Area Forecast; Airport records.

- **Overall market for general aviation aircraft.** Overall demand for general aviation aircraft is expected to increase over the forecast period, both in California and the U.S. as a whole. According to the FAA's long range aviation forecasts, the number of general aviation aircraft in the U.S. is expected to increase by almost 1.5 percent per year between 2004 and 2015, increasing from 210,000 in 2004 to 246,400 in 2015. The rate of growth is expected to slow in the period 2015 to 2025, averaging 0.9 percent over the period. The rate of growth in California is expected to be somewhat lower, averaging 0.7 percent per year over the period, increasing from 28,847 based aircraft in 2004 to 31,217 in 2016 while forecasts through the extended forecast period are not available, it is assumed growth in California will slow consistent with national trends.

- **Population and economic growth in the CMA.** According to forecasts prepared by NPA Data Services, adjusted to reflect the impacts from UC Merced as described below, between 2004 and 2016 the CMA is expected to experience strong growth in population, total jobs, non-farm jobs and personal income as well as during the 2016 forecast period, albeit at a somewhat slower rate than the earlier period (see Table 4-2). The projected rate of growth is forecast to exceed the rate of growth in both California and the U.S., leading to the CMA representing a greater share of population, employment and income relative to the state and nation (see Table 4-3). In particular, as urbanization and development of the Central Valley continues, the economy of the region will strengthen in the non-farm sector. As income from these jobs is generally higher than farm employment, total personal income is expected to increase dramatically. As discussed below, a significant contributor to this growth will be UC Merced.
 - **U.C. Merced.** The 2005 opening of the new University of California campus in Merced will affect both the number and type of population and employment in the City and CMA. According to the EIR prepared for the UC Merced Development Plan, at build out in 2030 the campus will serve 25,000 students and provide 6,300 direct jobs. An additional 7,000 indirect/induced jobs are expected to be created by support and spin-off activity generated by the campus. Further, between new students and non-local employees and dependents that could move to new jobs generated by the campus, an additional 48,000 people are expected to live in the CMA at build out of UC Merced. It was assumed that the campus would achieve 50 percent build out by 2016 for purposes of estimating the effects of UC Merced on population, employment and income in the CMA and reach 100 percent buildout by 2026.
 - **Agricultural employment.** Demand for based aircraft to support agricultural operations will be related to the level of future agricultural activity. Forecasts anticipate that agricultural employment in the CMA is expected to increase at the rate of one percent per year over the period 2004 to 2016, declining to 0.7 percent per year between 2016 and 2026, indicating a relatively minor increase in demand for based aircraft to support agricultural operations.
- **Potential overflow demand from Bay Area airports.** Some airports in the north part of the CMA as well as airports north of the CMA report experiencing some increase in demand for based aircraft parking due to overflow from airports in the Bay Area. The General Aviation Element of the Bay Area's Regional Airport System Plan (RASP), acknowledged this effect in the corporate aviation sector, although was not able to quantify the level of impact. In 2005 there were an estimated 700 corporate aircraft registered in three Bay Area counties (Alameda, San Mateo and Santa Clara) closest to the CMA. The overflow demand is occurring due to high aircraft parking prices, limited aircraft parking supply, and ground access and airspace congestion at Bay Area airports. Given Merced's distance from the Bay Area, the Airport would not be expected to directly capture a significant portion of this overflow demand. However, this overflow demand could cause some existing aircraft to relocate from more northern airports to airports, such as Merced, further to the south.
- **Pilot Population.** Future demand for based aircraft in the CMA is interrelated with the future pilot population. On one hand, the future pilot population is dependent on a supply of general aviation aircraft, as well as the cost of flying, and potential demand for corporate, agricultural and other types of for-hire general aviation activities. On the other hand, future demand for general aviation aircraft is dependent not only on the other factors outlined in this section, but also having pilots to operate the aircraft. Therefore, neither factor (based aircraft or pilot population) is a direct predictor of the other, but the two are interrelated and changes in one affect the other. The general aviation pilot population is comprised of three broad categories: students, private, and commercial. In the United States, both the student and private pilot populations have declined, while the number of commercial pilots has increased slightly (see Table 4-4). The trends in California are similar over the same period, except that the commercial pilot population also declined.

**Table 4-2
POPULATION, EMPLOYMENT AND INCOME IN THE CMA, CALIFORNIA AND UNITED STATES: 1980 – 2004**

year	Population (000s)			Total Employment (000s)			Non-Farm Employment (000s)			Total Personal Income (millions of constant 2000 dollars)		
	US	California	CMA	US	California	CMA	US	California	CMA	US	California	CMA
Historic												
1980	227,226.4	23,792.9	478.8	114,229.9	12,776.9	220.1	110,431.7	12,495.5	192.7	4,479,990	554,297	9,095
1981	229,467.2	24,286.0	493.5	115,302.7	12,969.5	220.8	111,552.2	12,693.6	194.1	4,605,114	570,575	8,852
1982	231,665.9	24,820.1	504.6	114,555.2	12,899.4	221.1	110,898.3	12,630.2	192.9	4,642,410	575,682	8,891
1983	233,793.4	25,360.1	519.6	116,054.8	13,218.9	224.6	112,174.5	12,929.2	195.3	4,739,997	593,508	8,945
1984	235,826.4	25,844.4	530.6	121,089.5	13,852.5	229.6	117,420.5	13,583.8	202.5	5,077,716	641,113	9,802
1985	237,925.2	26,441.1	545.0	124,510.0	14,359.7	237.3	121,044.0	14,105.8	211.5	5,268,187	673,235	10,387
1986	240,134.7	27,102.3	560.0	126,979.7	14,789.0	242.5	123,644.4	14,544.7	218.3	5,434,932	702,287	10,951
1987	242,290.6	27,777.2	578.5	130,414.3	15,396.4	257.0	127,138.9	15,149.2	232.5	5,586,896	732,571	11,650
1988	244,500.8	28,464.2	599.1	134,515.6	16,134.3	271.4	131,234.7	15,864.2	244.3	5,798,536	764,672	12,062
1989	246,820.5	29,218.2	624.7	137,238.8	16,555.9	283.1	134,038.6	16,280.7	254.4	5,983,845	792,245	12,721
1990	249,624.3	29,959.6	658.8	139,424.7	16,970.4	293.8	136,271.7	16,708.2	266.7	6,098,760	818,366	13,286
1991	252,982.4	30,470.8	682.3	138,652.8	16,877.6	300.3	135,549.0	16,605.3	272.1	6,090,049	805,338	13,338
1992	256,515.7	30,974.7	699.3	139,300.4	16,527.0	298.7	136,243.4	16,272.7	271.7	6,273,003	818,536	13,729
1993	259,920.1	31,275.0	714.9	141,993.9	16,506.0	301.7	138,864.2	16,233.8	273.8	6,380,004	813,798	13,794
1994	263,127.2	31,484.5	727.6	145,563.3	16,692.0	303.4	142,479.7	16,427.4	275.8	6,565,998	821,095	13,787
1995	266,279.7	31,696.6	731.4	149,364.1	17,093.6	309.9	146,258.2	16,809.3	280.5	6,761,251	842,350	13,610
1996	269,395.5	32,018.9	739.9	152,612.8	17,505.7	318.3	149,540.1	17,213.5	287.7	6,988,891	868,417	14,214
1997	272,648.4	32,486.0	752.7	156,213.9	17,842.0	323.9	153,127.4	17,564.2	294.1	7,265,264	903,433	14,808
1998	275,855.6	32,987.7	767.2	160,213.0	18,559.6	342.5	157,086.8	18,220.1	307.2	7,698,621	966,602	15,658
1999	279,217.2	33,499.2	784.2	163,448.8	19,049.6	353.0	160,291.4	18,681.3	314.1	7,945,567	1,015,899	16,103
2000	282,403.1	34,010.4	802.4	167,385.5	19,657.9	356.2	164,275.1	19,328.7	322.1	8,365,633	1,095,603	16,686
2001	285,318.0	34,578.7	827.3	167,638.9	19,833.6	356.6	164,563.5	19,533.4	326.3	8,472,033	1,102,382	16,893
2002	288,156.3	35,002.0	852.1	166,505.9	19,749.7	367.8	164,060.8	19,559.0	335.3	8,610,715	1,116,393	18,337
2003	290,828.9	35,484.5	875.1	169,344.1	20,159.8	358.2	163,956.4	19,426.3	328.0	8,647,940	1,120,555	18,299
2004	293,846.6	35,850.1	884.3	170,750.2	20,499.5	376.2	167,721.2	20,189.3	345.1	9,152,116	1,195,989	19,908
Forecast												
2011	315,388.3	39,322.5	1,034.3	195,659.9	24,037.0	447.6	192,665.9	23,702.4	414.1	11,675,306	1,560,406	29,360
2016	331,836.7	41,908.7	1,163.1	210,133.7	26,160.3	496.3	207,164.7	25,810.6	461.3	13,337,170	1,799,036	36,188
2026	369,627.0	47,632.4	1,350.4	233,352.8	29,657.2	564.7	230,433.8	29,282.9	527.1	16,755,828	2,291,123	50,261
% Average Annual Change												
1980-1990	0.9%	2.3%	3.2%	2.0%	2.9%	2.9%	2.1%	2.9%	3.3%	3.1%	4.0%	3.9%
1991-2000	1.2%	1.2%	1.8%	2.1%	1.7%	1.9%	2.2%	1.7%	1.9%	3.6%	3.5%	2.5%
2000-2004	1.0%	1.2%	2.2%	0.6%	1.1%	1.8%	0.6%	1.1%	1.9%	2.6%	2.8%	5.6%
1980-2004	1.1%	1.7%	2.6%	1.7%	2.0%	2.3%	1.8%	2.0%	2.5%	3.0%	3.3%	3.3%
2004-2011	1.0%	1.3%	2.3%	2.0%	2.3%	2.5%	2.0%	2.3%	2.6%	3.5%	3.9%	5.7%
2011-2016	1.0%	1.3%	2.4%	1.4%	1.7%	2.1%	1.5%	1.7%	2.2%	2.7%	2.9%	4.3%
2016-2026	1.1%	1.3%	1.5%	1.1%	1.3%	1.3%	1.1%	1.3%	1.3%	2.3%	2.4%	3.3%

Sources: NPA Data Service, DMJM Aviation.

**Table 4-3
CMA SHARE OF CALIFORNIA AND UNITED STATES POPULATION, EMPLOYMENT AND INCOME**

Year	CMA Share of:							
	Population		Total Employment		Non-Farm Employment		Personal Income	
	US	California	US	California	US	California	US	California
Historic								
1980	0.21%	2.01%	0.19%	1.72%	0.17%	1.54%	0.20%	1.64%
1981	0.22%	2.03%	0.19%	1.70%	0.17%	1.53%	0.19%	1.55%
1982	0.22%	2.03%	0.19%	1.71%	0.17%	1.53%	0.19%	1.54%
1983	0.22%	2.05%	0.19%	1.70%	0.17%	1.51%	0.19%	1.51%
1984	0.22%	2.05%	0.19%	1.66%	0.17%	1.49%	0.19%	1.53%
1985	0.23%	2.06%	0.19%	1.65%	0.17%	1.50%	0.20%	1.54%
1986	0.23%	2.07%	0.19%	1.64%	0.18%	1.50%	0.20%	1.56%
1987	0.24%	2.08%	0.20%	1.67%	0.18%	1.53%	0.21%	1.59%
1988	0.25%	2.10%	0.20%	1.68%	0.19%	1.54%	0.21%	1.58%
1989	0.25%	2.14%	0.21%	1.71%	0.19%	1.56%	0.21%	1.61%
1990	0.26%	2.20%	0.21%	1.73%	0.20%	1.60%	0.22%	1.62%
1991	0.27%	2.24%	0.22%	1.78%	0.20%	1.64%	0.22%	1.66%
1992	0.27%	2.26%	0.21%	1.81%	0.20%	1.67%	0.22%	1.68%
1993	0.28%	2.29%	0.21%	1.83%	0.20%	1.69%	0.22%	1.70%
1994	0.28%	2.31%	0.21%	1.82%	0.19%	1.68%	0.21%	1.68%
1995	0.27%	2.31%	0.21%	1.81%	0.19%	1.67%	0.20%	1.62%
1996	0.27%	2.31%	0.21%	1.82%	0.19%	1.67%	0.20%	1.64%
1997	0.28%	2.32%	0.21%	1.82%	0.19%	1.67%	0.20%	1.64%
1998	0.28%	2.33%	0.21%	1.85%	0.20%	1.69%	0.20%	1.62%
1999	0.28%	2.34%	0.22%	1.85%	0.20%	1.68%	0.20%	1.59%
2000	0.28%	2.36%	0.21%	1.81%	0.20%	1.67%	0.20%	1.52%
2001	0.29%	2.39%	0.21%	1.80%	0.20%	1.67%	0.20%	1.53%
2002	0.30%	2.43%	0.22%	1.86%	0.20%	1.71%	0.21%	1.64%
2003	0.30%	2.47%	0.21%	1.78%	0.20%	1.69%	0.21%	1.63%
2004	0.30%	2.47%	0.22%	1.84%	0.21%	1.71%	0.22%	1.66%
Forecast								
2011	0.33%	2.63%	0.23%	1.86%	0.21%	1.75%	0.25%	1.88%
2016	0.35%	2.78%	0.24%	1.90%	0.22%	1.79%	0.27%	2.01%
2026	0.37%	2.84%	0.24%	1.90%	0.23%	1.80%	0.30%	2.19%
% Average Annual Change								
1980-1990	2.3%	0.9%	0.9%	0.0%	1.2%	0.3%	0.7%	-0.1%
1991-2000	0.6%	0.6%	-0.2%	0.2%	-0.3%	0.2%	-1.0%	-0.9%
2000-2004	1.2%	1.0%	1.2%	0.7%	1.2%	0.8%	2.9%	2.8%
1980-2004	1.5%	0.9%	0.6%	0.3%	0.7%	0.4%	0.3%	0.1%
2004-2011	1.2%	0.9%	0.5%	0.2%	0.6%	0.3%	2.1%	1.8%
2011-2016	1.3%	1.1%	0.6%	0.4%	0.7%	0.5%	1.5%	1.3%
2016-2026	0.4%	0.2%	0.2%	0.0%	0.3%	0.1%	1.0%	0.9%

Sources: NPA Data Services; Analysis by DMJM Aviation.

**Table 4-4
GENERAL AVIATION PILOT POPULATION
UNITED STATES AND CALIFORNIA
1996 AND 2004**

Type	United States			California		
	1996	2004	% Annual Change	1996	2004	% Annual Change
Student	101,279	87,296	-1.8%	12,086	9,830	-2.5%
Private	261,399	256,584	-0.2%	35,492	32,292	-1.2%
Commercial	133,980	135,064	0.1%	15,667	14,808	-0.7%
Total	496,658	478,944	-0.5%	63,245	56,930	-1.3%

Source: Federal Aviation Administration, Office of Aviation Policy and Plans.

It should be noted that while the general aviation pilot population declined over the period 1996 to 2004, the number of general aviation aircraft increased in both California and the United States, illustrating the fact that there is not a direct cause and effect relationship between the pilot population and the number of general aviation aircraft. The FAA expects the number of general aviation pilots in the United States (forecasts are not available at the state level) to increase between 2004 and 2016, as shown in Table 4-5.

**Table 4-5
GENERAL AVIATION PILOT POPULATION
UNITED STATES
2004 AND 2016**

Type	United States		% Annual Change
	2004	2016	
Student	87,296	108,800	1.9%
Private	256,584	273,600	0.5%
Commercial	135,064	149,550	0.9%
Total	478,944	531,950	0.9%

Source: Federal Aviation Administration, Office of Aviation Policy and Plans.

While both the private and commercial categories are expected to increase modestly, the student pilot population is anticipated to increase at more than double the rate of the other categories. This indicates that the longer term prospects (post 2016) for private and commercial pilots are strong.

Forecast of Demand for Based Aircraft in the CMA

Based aircraft in the general aviation Competitive Market Area are projected to increase from 623 in 2004 to 828 in the year 2026 under the Baseline Forecast; 911 under the High Growth Forecast; and 708 under the Low Growth Forecast.

Three scenarios were developed to estimate the potential range of future demand for general aviation aircraft based in the CMA:

- Baseline Forecast:** The Baseline Forecast assumes the CMA will capture an increasing share of the overall market for general aviation based aircraft in California due to (1) increased population, job and income growth in the CMA relative to California and the U.S and (2) increased corporate aviation activity in the CMA due to corporate aircraft relocating from the Bay Area. The increasing capture rate is based on the change in the average CMA capture of California population, employment and income, including the effects of UC Merced. The forecast reflects the overall market conditions expected in California and the CMA's changing role in that market.
- High Growth Forecast:** The High Growth Forecast assumes that the CMA's capture of overall demand in California is increased by 10 percent over the Baseline Forecast assuming UC Merced's growth inducing effects are greater than expected and there is additional based aircraft overflow from Bay Area airports.
- Low Growth Forecast:** While the CMA's high rate of population, employment and income growth relative to California and the U.S., combined with the on-going urbanization and increased non-farm employment base, should result in an increased capture on the California market for general aviation based aircraft, historically the CMA's share of the California market has remained relatively stable. The Low Growth Scenario tests the impact of this historic trend continuing into the future. Specifically, this scenario assumes that the CMA's average historic capture rate of 2.2 percent remains constant through the forecast period.

Using this approach, the total number of based aircraft in the CMA under the Baseline, High Growth and Low Growth Forecasts are shown in Table 4-6.

**Table 4-6
BASED AIRCRAFT FORECAST - MERCED MUNICIPAL AIRPORT CMA
2004 – 2026**

	Actual	Forecast			Avg. Annual Change		
	2004	2011	2016	2026	2004-2011	2011-2016	2016-2026
California	28,847	30,514	31,217	32,802	0.8%	0.5%	0.5%
CMA							
Baseline	623	706	759	828	1.8%	1.4%	0.9%
High Growth	623	777	835	911	3.2%	1.4%	0.9%
Low Growth	623	659	674	708	0.8%	0.5%	0.5%
CMA % California							
Baseline	2.2%	2.3%	2.4%	2.5%			
High Growth	2.2%	2.5%	2.7%	2.8%			
Low Growth	2.2%	2.2%	2.2%	2.2%			

Source: FAA (California forecast); DMJM Aviation (CMA forecast).

Total Based Aircraft at Merced Municipal Airport

Based aircraft at Merced Municipal Airport are projected to increase from 101 in 2004 to 180 in the year 2026 under the Baseline Forecast; 249 under the High Growth Forecast; and 115 under the Low Growth Forecast.

Historically, Merced has hosted an average of 17 percent of the general aviation aircraft based in the CMA. This rate has varied from a low of 15.8 percent to as much as 19 percent, as may be noted in Table 4-7. Merced is the third largest airport behind Modesto and Madera in the CMA in terms of number of based general aviation aircraft. Modesto is the largest airport due its location in the largest city in the CMA. Madera's second place position is due to its location along a major north-south transportation corridor (SR99) at the southern end of the CMA, where it also may be capturing some demand from areas to the south.

Merced's capture of future demand in the CMA will be affected by its competitive position relative to other airports in the CMA. Merced's competitive position will be affected by factors such as location relative to major sources of potential demand, accessibility, the number and type of facilities offered at the airport and at other airports in the region, and the cost of using facilities at the airport versus other airports in the region.

Overall, Merced Municipal Airport is well positioned to capture an increasing share of the CMA's demand for general aviation based aircraft. Relative to location near major sources of potential demand, Merced Municipal Airport is located in the City of Merced, the second largest city in the CMA behind Modesto and the location of the new University of California campus. Population, employment and income growth in the CMA and the potential impact of UC Merced were discussed above.

The airport is also near the center of the CMA and is located adjacent to SR99, a major north-south highway. East-west access is via SR140. Thus, the airport enjoys excellent access to the balance of the CMA.

The airport's facilities are generally competitive or superior to other airports in the CMA (see Table 4-8). With the exception of Castle Airport's 11,800 foot runway, Merced and Modesto have the longest runways in the CMA at 5,900 feet, and runway width and weight bearing capacity superior to most other airports in the CMA. The airport has 51 hangars with room to expand and has an operating FBO. Merced is one of two airports in the CMA with commercial air service. Merced's rates and charges are generally competitive with other airports in the CMA. Merced's closest regional competitor, Castle Airport located about 20 miles north of Merced in Atwater. Castle has competitive facilities, but is currently focusing on developing air cargo.

For purposes of this forecast, the following assumptions were made regarding Merced's future share of the based aircraft market in the CMA:

- **Baseline Forecast:** Merced's future market capture will increase to its historic high of 19 percent by 2016 from 16.2 percent in 2004. Market capture will continue to increase between 2016 and 2026 at the rate experienced between 2011 and 2016, reaching 21.8 percent by 2026. This scenario reflects a condition where Merced's competitive position improves due to the factors previously discussed.
- **High Growth Forecast:** Merced's future market capture will increase by 10 percent over its historic high, reaching 27.4 percent by 2026. This scenario reflects a condition where UC Merced's growth inducing effects are greater than expected and Merced Municipal's proximity to the campus positively impacts its competitive position in the CMA. This scenario also assumes that general aviation activity at Castle Airport is reduced or eliminated through the Airport's master plan focusing on heavy aircraft maintenance and air cargo activity, and that most, if not all, of general aviation aircraft based at Castle move to Merced.
- **Low Growth Forecast:** Merced's future market capture remains at current levels (16.2 percent) over the forecast period. This scenario reflects a condition where Merced's competitive position in the market area remains unchanged.

**Table 4-7
 BASED AIRCRAFT IN THE
 MERCED MUNICIPAL AIRPORT CMA: 1980-2004**

Year	Airport									Total
	Merced Muni	Castle	Chowchilla	Gustine	Los Banos	Madera	Mariposa	Modesto	Turlock	
Market Area Based Aircraft										
1980	104	na	21	24	26	64	51	226	36	552
1981	111	na	28	23	31	80	53	232	36	594
1982	116	na	32	21	36	94	53	235	35	622
1983	92	na	32	21	35	96	53	203	43	575
1984	91	na	32	21	35	96	53	204	43	575
1985	115	na	32	21	31	119	38	204	41	601
1986	103	na	28	21	24	107	49	213	54	599
1987	103	na	28	21	24	107	49	206	54	592
1988	103	na	28	21	24	107	48	203	54	588
1989	98	na	20	21	28	113	39	210	75	604
1990	91	na	22	22	27	106	39	182	75	564
1991	94	na	33	21	27	110	39	182	75	581
1992	98	na	33	21	29	103	50	176	65	575
1993	98	na	33	21	29	103	50	176	65	575
1994	98	na	33	20	29	116	50	176	51	573
1995	98	na	34	20	24	119	48	176	65	584
1996	108	1	34	20	24	119	48	176	65	595
1997	101	9	34	20	24	120	55	176	65	604
1998	101	9	34	20	24	120	55	176	65	604
1999	101	20	34	20	24	120	58	176	61	614
2000	101	20	34	20	24	120	58	176	61	614
2001	101	20	34	20	24	120	58	176	62	615
2002	101	20	34	20	24	120	58	176	62	615
2003	101	20	34	20	24	120	58	179	62	618
2004	101	20	34	20	24	120	58	184	62	623
Percent Market Area Based Aircraft										
1980	18.8%	na	3.8%	4.3%	4.7%	11.6%	9.2%	40.9%	6.5%	100.0%
1981	18.7%	na	4.7%	3.9%	5.2%	13.5%	8.9%	39.1%	6.1%	100.0%
1982	18.6%	na	5.1%	3.4%	5.8%	15.1%	8.5%	37.8%	5.6%	100.0%
1983	16.0%	na	5.6%	3.7%	6.1%	16.7%	9.2%	35.3%	7.5%	100.0%
1984	15.8%	na	5.6%	3.7%	6.1%	16.7%	9.2%	35.5%	7.5%	100.0%
1985	19.1%	na	5.3%	3.5%	5.2%	19.8%	6.3%	33.9%	6.8%	100.0%
1986	17.2%	na	4.7%	3.5%	4.0%	17.9%	8.2%	35.6%	9.0%	100.0%
1987	17.4%	na	4.7%	3.5%	4.1%	18.1%	8.3%	34.8%	9.1%	100.0%
1988	17.5%	na	4.8%	3.6%	4.1%	18.2%	8.2%	34.5%	9.2%	100.0%
1989	16.2%	na	3.3%	3.5%	4.6%	18.7%	6.5%	34.8%	12.4%	100.0%
1990	16.1%	na	3.9%	3.9%	4.8%	18.8%	6.9%	32.3%	13.3%	100.0%
1991	16.2%	na	5.7%	3.6%	4.6%	18.9%	6.7%	31.3%	12.9%	100.0%
1992	17.0%	na	5.7%	3.7%	5.0%	17.9%	8.7%	30.6%	11.3%	100.0%
1993	17.0%	na	5.7%	3.7%	5.0%	17.9%	8.7%	30.6%	11.3%	100.0%
1994	17.1%	na	5.8%	3.5%	5.1%	20.2%	8.7%	30.7%	8.9%	100.0%
1995	16.8%	na	5.8%	3.4%	4.1%	20.4%	8.2%	30.1%	11.1%	100.0%
1996	18.2%	0.2%	5.7%	3.4%	4.0%	20.0%	8.1%	29.6%	10.9%	100.0%
1997	16.7%	1.5%	5.6%	3.3%	4.0%	19.9%	9.1%	29.1%	10.8%	100.0%
1998	16.7%	1.5%	5.6%	3.3%	4.0%	19.9%	9.1%	29.1%	10.8%	100.0%
1999	16.4%	3.3%	5.5%	3.3%	3.9%	19.5%	9.4%	28.7%	9.9%	100.0%
2000	16.4%	3.3%	5.5%	3.3%	3.9%	19.5%	9.4%	28.7%	9.9%	100.0%
2001	16.4%	3.3%	5.5%	3.3%	3.9%	19.5%	9.4%	28.6%	10.1%	100.0%
2002	16.4%	3.3%	5.5%	3.3%	3.9%	19.5%	9.4%	28.6%	10.1%	100.0%
2003	16.3%	3.2%	5.5%	3.2%	3.9%	19.4%	9.4%	29.0%	10.0%	100.0%
2004	16.2%	3.2%	5.5%	3.2%	3.9%	19.3%	9.3%	29.5%	10.0%	100.0%
Average	17.0%	2.5%	5.2%	3.5%	4.6%	18.3%	8.5%	32.3%	9.6%	
High	19.1%	3.3%	5.8%	4.3%	6.1%	20.4%	9.4%	40.9%	13.3%	
Low	15.8%	0.2%	3.3%	3.2%	3.9%	11.6%	6.3%	28.6%	5.6%	

Sources: FAA 2004 Terminal Area Forecast; Airport records.

**Table 4-8
CHARACTERISTICS OF AIRPORTS IN MERCED MUNICIPAL AIRPORT CMA**

	MERCED	Regional Competitors							
		Castle	Chowchilla	Los Banos	Madera	Mariposa	Modesto	Gustine	Turlock
Attended	0800-1700	0900-1800	unatt	unatt	M-F 07-1630	8/26	ALL	Unatt	ALL
Type	Public	Public	Public	Public	Public	Public	Public	Public	Public
Commercial service	Yes	No	No	No	No	No	Yes	No	No
Runways	12/30	13/31	12/30	14/32	7/25		10L/28R	18/36	12/30
Length	5,903	11,802	3,250	3,005	3,720	3,310	5,911	3,200	2,985
Width	150	300	60	75	150	60	150	60	50
Gross Weight									
SW	30	155	12	23	30	12	60	12	12
DW	100	200					200		
DTW	140	415					350		
Property (acres)	450	1,348	75	101	524	100	435		320
Total Hangars	51	24	11	~32	27	40	109	0	46
No. of T-hangars	22	2	11	n/a	24	28	109	0	46
Closed bay hangars	10	20	0	n/a	2	~12	0	0	0
Open bay hangars	18	2	0	n/a	0	0	0	0	0
Executive hangars	1	0	0	1	1	9	0	0	0
Total Tie-downs	67	12	15	n/a	n/a	31	n/a		39
No. of FBO's	1	1	2	0	3	0	n/a	0	1

Sources: Merced Municipal Airport; DMJM Aviation.

Applying these assumptions to the total number of based aircraft forecast for the CMA results in the projections of based aircraft at Merced shown in Table 4-9. As may be noted, under the Baseline Forecast based aircraft at Merced increase from 101 in 2004 to 180 by 2026. Under the Low Growth and High Growth Scenarios, based aircraft at the Airport reach 115 and 249, respectively.

**Table 4-9
BASED AIRCRAFT FORECAST
MERCED MUNICIPAL AIRPORT 2004 - 2026**

	Actual	Forecast			Avg. Annual Change		
	2004	2011	2016	2026	2004-2011	2011-2016	2016-2026
CMA							
Baseline	623	706	759	828	1.8%	1.4%	0.9%
High Growth	623	777	835	911	3.2%	1.4%	0.9%
Low Growth	623	659	674	708	0.8%	0.5%	0.5%
Merced Municipal							
Baseline	101	123	144	180	3.0%	3.0%	2.3%
High Growth	101	147	182	250	5.6%	4.3%	3.2%
Low Growth	101	107	109	115	0.8%	0.5%	0.5%
Merced % CMA							
Baseline	16.2%	17.6%	19.0%	21.8%			
High Growth	16.2%	19.0%	21.8%	27.4%			
Low Growth	16.2%	16.2%	16.2%	16.2%			

Sources: FAA (actual); DMJM Aviation (forecast).

Fleet Mix of Aircraft Based at Merced

The future fleet mix of aircraft at Merced reflects the increasing importance of corporate aviation from 8.9 percent of the fleet mix in 2004 to 17.6 percent in 2026.

The forecast of the fleet mix of general aviation aircraft located at Merced was based on the existing 2004 fleet mix, modified to reflect future trends in the CMA and information obtained from Merced Municipal Airport management.

Historic fleet mix information at Merced Municipal and the CMA are shown in Table 4-10. As may be noted, the fleet mix in the CMA and at Merced have historically consisted mostly of single and multi-engine aircraft. There are few jets (6) and helicopters (6) based in the CMA. No jets and only one helicopter are based at Merced.

The future based aircraft fleet mix at Merced Municipal was estimated based on the trends expected in the CMA as reflected in the FAA's 2005 Terminal Area Forecast. The fleet mix was modified under the Baseline and High Growth Forecast to incorporate specific information available from Merced Municipal Airport management on jet aircraft that are expected to locate at the Airport.

When applied to the total number of based aircraft forecast to locate at the airport, these assumptions result in the fleet mix of based aircraft shown in Table 4-11. Single engine piston aircraft are expected to be the predominant type of based aircraft located at Merced, followed by multi-engine piston, jet, and helicopter/other.

Significant conclusions resulting from the based aircraft forecast include:

- Merced Municipal Airport is projected to experience strong demand for new based aircraft over the forecast period. After experiencing virtually no growth at the airport over the past 24 years, the number of based aircraft located at the airport could increase by almost 80 percent by 2026 under the Baseline Scenario. The rate of growth at the airport under this scenario is over twice the rate expected in the CMA as a whole and over five times the rate expected in the greater California market. Under the High Growth Scenario, the number of based aircraft located at Merced could increase by 150 percent by 2026 over 2004 levels.
- The primary drivers of this growth include (1) strong population and economic growth in the CMA, (2) the opening of the new UC Merced campus near the airport which will result in new direct, indirect and induced jobs, increased incomes and new student and permanent population, (3) potential overflow demand from Bay Area airports, particularly for corporate aircraft, and (4) the competitive position of Merced Municipal Airport in the CMA, including its proximity to UC Merced.
- The future fleet mix of aircraft based at the Airport reflects the increasing importance of corporate aviation in the market. Corporate aircraft are generally multi engine propeller or jets and require higher levels of service such as fueling, maintenance, hangars, etc. The number of aircraft in these categories is expected to more than triple over the forecast period with the share of these categories expected to increase from 8.9 percent of the fleet based at the airport in 2004 to 17.9 percent by 2026 under the Baseline Scenario. The actual number of future corporate aircraft will be contingent on the assumed growth in the sector and the realization of plans by manufacturers and operators as presently understood.

**Table 4-10
 BASED AIRCRAFT FLEET MIX
 MERCED MUNICIPAL AIRPORT AND CMA
 1980 - 2004**

Year	Single Engine	Jet	Multi Engine	Helicopter	Other	Total
CMA						
1980	487	0	60	4	2	553
1985	558	3	54	6	0	621
1990	509	5	56	7	7	584
1995	520	6	63	7	8	604
2000	532	6	55	6	15	614
2004	539	6	57	6	15	623
Merced Municipal						
1980	99	0	4	1	0	104
1985	107	0	8	0	0	115
1990	76	0	13	1	1	91
1995	82	0	13	2	1	98
2000	90	0	9	1	1	101
2004	90	0	9	1	1	101
Merced Municipal % of CMA						
1980	20.3%	0.0%	6.7%	25.0%	0.0%	18.8%
1985	19.2%	0.0%	14.8%	0.0%	0.0%	18.5%
1990	14.9%	0.0%	23.2%	14.3%	14.3%	15.6%
1995	15.8%	0.0%	20.6%	28.6%	12.5%	16.2%
2000	16.9%	0.0%	16.4%	16.7%	6.7%	16.4%
2004	16.7%	0.0%	15.8%	16.7%	6.7%	16.2%

Sources: FAA 2004 Terminal Area Forecast; Airport records.

**Table 4-11
FORECAST BASED AIRCRAFT FLEET MIX
MERCED MUNICIPAL AIRPORT
2004 - 2026**

	Total				% Total			
	2004	2011	2016	2026	2004	2011	2016	2026
Baseline Forecast								
Aircraft Type								
Single Engine	90	102	116	142	89.1%	82.3%	80.4%	78.5%
Multi Engine	9	11	14	17	8.9%	9.2%	9.4%	9.6%
Jet	0	7	10	14	0.0%	6.0%	7.0%	8.0%
Helicopter	1	1	1	2	1.0%	1.0%	1.0%	1.0%
Other	1	2	3	5	1.0%	1.6%	2.2%	2.8%
Total	101	123	144	180	100.0%	100.0%	100.0%	100.0%
High Growth Forecast								
Aircraft Type								
Single Engine	90	121	146	196	89.1%	82.3%	80.4%	78.5%
Multi Engine	9	14	17	24	8.9%	9.2%	9.4%	9.6%
Jet	0	9	13	20	0.0%	6.0%	7.0%	8.0%
Helicopter	1	1	2	3	1.0%	1.0%	1.0%	1.0%
Other	1	2	4	7	1.0%	1.6%	2.2%	2.8%
Total	101	147	182	250	100.0%	100.0%	100.0%	100.0%
Low Growth Forecast								
Aircraft Type								
Single Engine	90	94	95	98	89.1%	87.8%	86.5%	85.2%
Multi Engine	9	10	10	11	8.9%	9.2%	9.4%	9.6%
Jet	0	0	1	2	0.0%	0.5%	0.9%	1.4%
Helicopter	1	1	1	1	1.0%	1.0%	1.0%	1.0%
Other	1	2	2	3	1.0%	1.6%	2.2%	2.8%
Total	101	107	109	115	100.0%	100.0%	100.0%	100.0%

Source: DMJM Aviation.

Comparison with Other Forecasts

Four other forecasts of based aircraft have been prepared for Merced. These forecasts - the 2005 Terminal Area Forecast (TAF) prepared by the FAA¹, the 1999 Statewide Forecasts prepared by the California Department of Transportation (CALTRANS)², the Merced County Regional Aviation System Plan 1997 Update³, and the 1990 Merced Municipal Airport Master Plan⁴ - are summarized in Table 4-12.

**Table 4-12
COMPARISON OF BASELINE FORECAST OF BASED
AIRCRAFT WITH FAA 2005 TAF, 1999 CASP,
1997 MERCED CO. RASP, AND 1990 AIRPORT MASTER PLAN**

Item	Forecast				Master Plan Forecast Percent Above (Below) Other Forecast			
	2004	2011	2016	2026	2004	2011	2016	2026
Baseline	101	123	144	180	-	-	-	-
2005 TAF	99	99	99	N/A	2%	24%	45%	-
1999 CASP	127	146	161	N/A	(20%)	(16%)	(11%)	-
1997 Merced Co. RASP	100	104	118	N/A	1%	18%	22%	-
1990 Master Plan	130	145	N/A	N/A	(22%)	(15%)	-	-

Sources: As noted.

As may be noted, the FAA 2005 TAF anticipates no growth in the number of general aviation aircraft based at Merced over the forecast period. The 1999 CASP and the 1990 Master Plan forecast are higher than the Baseline Forecast by the year 2016. This difference is largely due to a higher 2004 based aircraft estimate. The 1997 Merced County RASP anticipates less than one-half of the growth anticipated under the Baseline Scenario. Considering the large range of differences between other forecasts for the airport, the current Baseline Forecast appears reasonable.

MARKET ASSESSMENT FOR ENPLANED PASSENGERS

Fresno-Yosemite International Airport captures 94 percent of enplanements in Fresno, Merced, Madera, Mariposa and Stanislaus Counties. Modesto City-County Airport and Merced capture five and one percent, respectively.

An enplaned passenger is one that is departing the airport as a passenger on a commercial airline. This forecast value is used in developing projections of aircraft activity, as well as determining facility requirements for airport elements such as terminal space and auto parking.

The approach used to forecast enplaned commercial passengers at Merced involved the following steps: (i) project total enplaned passengers in the Merced Competitive Market Area (CMA); (ii) forecast the share of enplaned passengers served at CMA airports versus those traveling to airports outside the CMA for air travel (leakage) considering both supply (competitive airports) and demand factors; (iii) project the share of enplaned passengers captured by CMA airports; and (iv) project the share of CMA enplanements captured at Merced Municipal Airport. The methodology and assumptions used in each step are described below.

¹ FAA, 2005 Terminal Area Forecast Database, March 2005.

² CALTRANS Aeronautics Program, 1999 Statewide Forecasts, The California Aviation System Plan, September 1999.

³ Merced County Association of Governments, Merced County Regional Aviation System Plan 1997 Update, October 1997.

⁴ City of Merced, Merced Municipal Airport Master Plan Report, December 1990.

Passenger Enplanements at Competitive Market Area Airports

Merced Municipal Airport is located in the City of Merced and competes for passenger enplanements with other commercial service airports in a five county area including Fresno, Merced, Madera, Mariposa, and Stanislaus. Other commercial service airports in the CMA include Fresno-Yosemite International Airport (65 miles south of Merced) and Modesto City-County Airport (41 miles north of Merced). The CMA for Merced is depicted in Figure 4-2.

Over past 24 years (1980 to 2004), passenger enplanements in the CMA increased by an average of 0.7 percent per year, from 529,845 in 1980 to 619,861 in 2004 (see Table 4-13). Annual changes in the number of passenger enplanements in the CMA were variable with some years experiencing increases and others experiencing declines. In particular, the events of 9/11 resulted in dramatic declines in passenger activity in 2001 and 2002. Figure 4-3 graphically presents historical enplanements.

Fresno-Yosemite International Airport captures the largest share of passenger enplanements in the CMA, averaging approximately 94 percent of enplanements in the CMA. Modesto averages just under five percent of CMA enplanements, and Merced about one percent. However, after declining in the late 1990's, the introduction of service to North Las Vegas Airport increased Merced's share of CMA enplanements since 2000 to about 1.5 percent of total enplanements at CMA airports.

Commercial passenger enplanements in the CMA are largely limited to regional/commuter service. United Airlines served Merced through deregulation of the airline industry in October 1978 and terminated service in March 1979. Since then airline service at Merced has been provided by the following:

Period	Airline
April 1979 through February 1980	Air Pacific Airlines
March 1980 through August 1981	Golden Gate Airlines
June 1982 through September 1983	Inland Empire Airlines
April 1984 through August 1987	Wings West/American Air
August 1987 through May 1998	West Air/United Express
June 1998 through September 2001	Skywest/United Express
September 2001 through November 2006	Scenic Airlines
November 2006 to present	Mesa Airlines

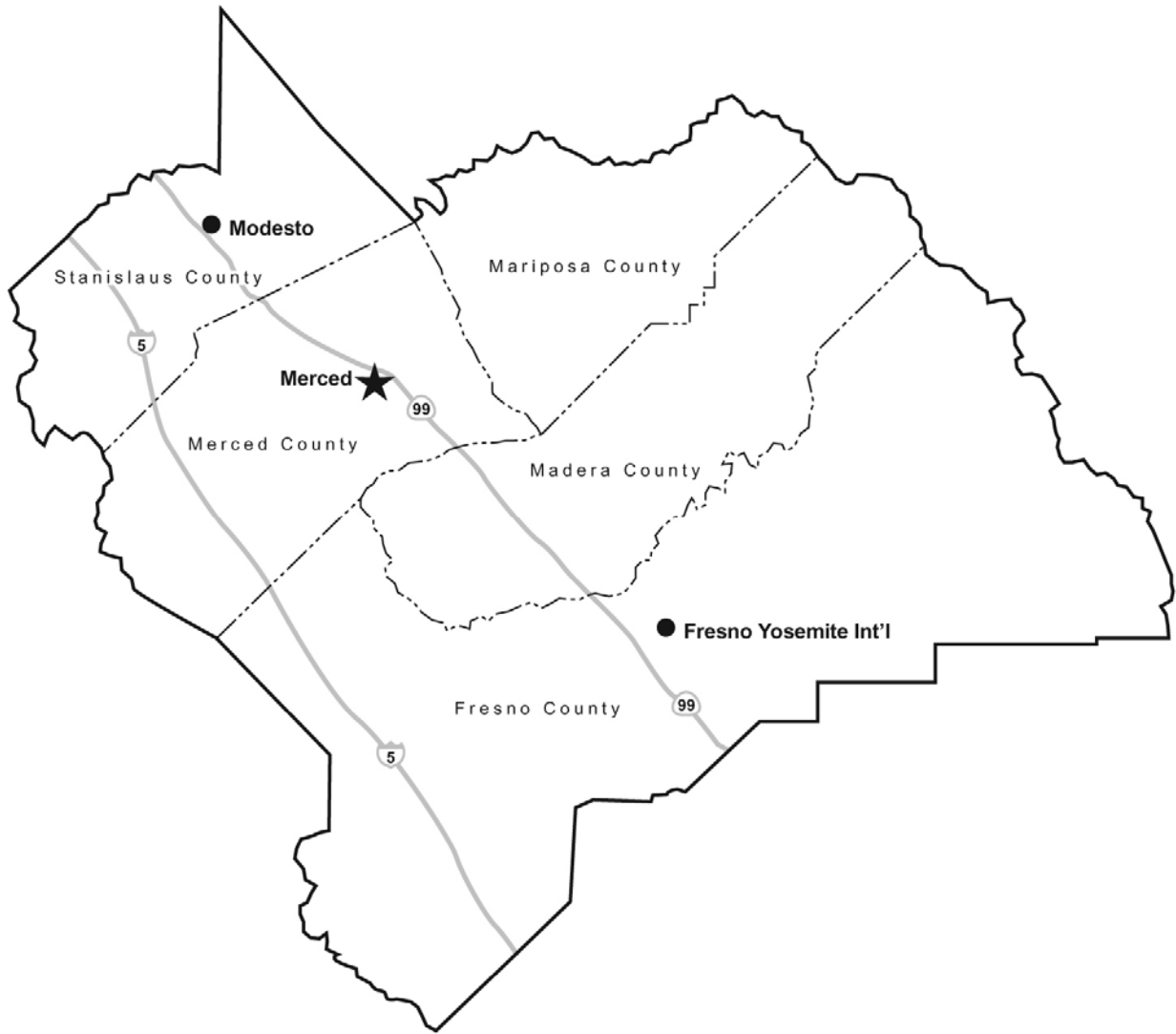
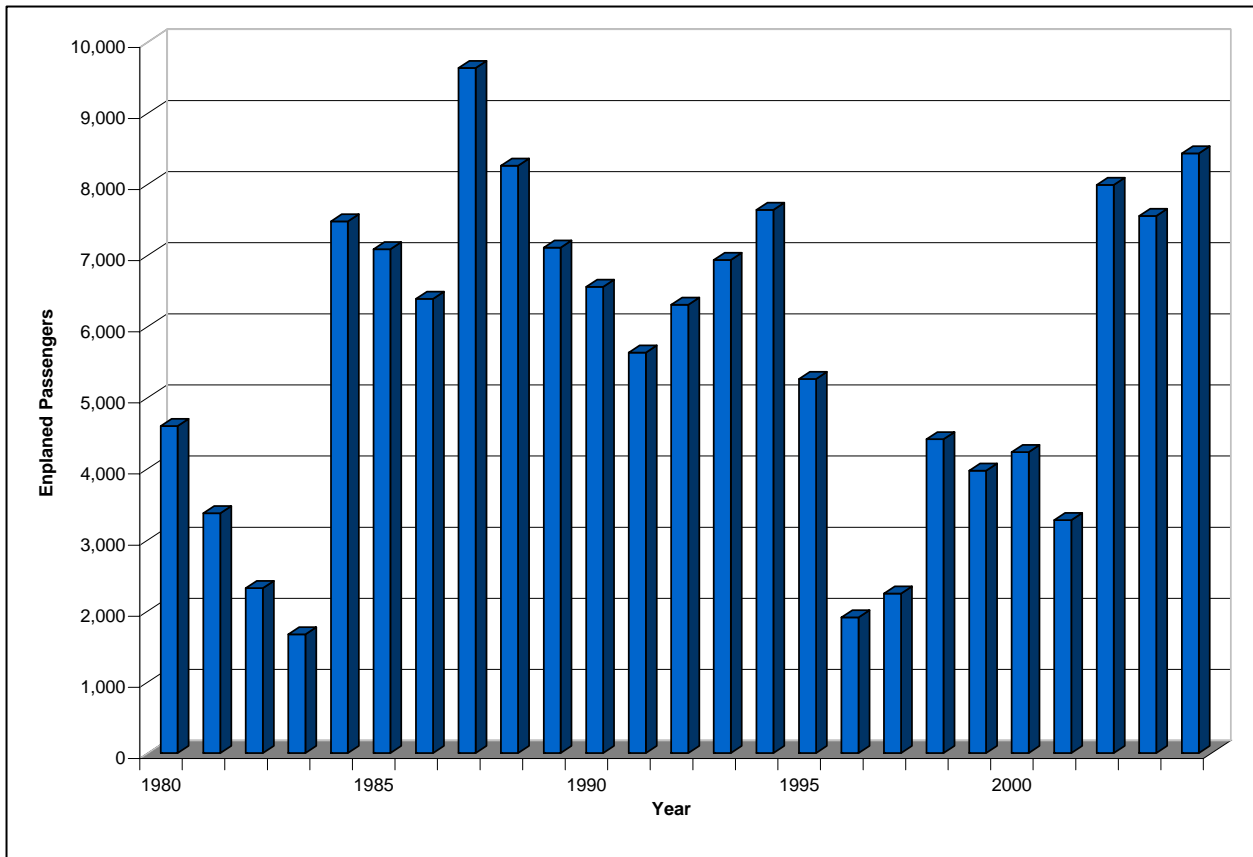


Figure 4-2
Merced Municipal Airport
Passenger Enplanement
Competitive Market Area

**Table 4-13
HISTORIC PASSENGER ENPLANEMENTS
IN THE MERCED MUNICIPAL AIRPORT CMA**

Year	Total Enplanements				% Total Enplanements			
	Merced	Modesto	Fresno	Total	Merced	Modesto	Fresno	Total
Total Enplanements								
1980	4,600	24,133	501,112	529,845	0.9%	4.6%	94.6%	100.0%
1981	3,372	14,724	335,985	354,081	1.0%	4.2%	94.9%	100.0%
1982	2,322	20,651	353,645	376,618	0.6%	5.5%	93.9%	100.0%
1983	1,669	22,738	419,208	443,615	0.4%	5.1%	94.5%	100.0%
1984	7,477	25,458	453,691	486,626	1.5%	5.2%	93.2%	100.0%
1985	7,087	23,099	411,584	441,770	1.6%	5.2%	93.2%	100.0%
1986	6,387	19,863	421,334	447,584	1.4%	4.4%	94.1%	100.0%
1987	9,633	21,622	482,728	513,983	1.9%	4.2%	93.9%	100.0%
1988	8,261	15,878	405,437	429,576	1.9%	3.7%	94.4%	100.0%
1989	7,108	24,119	424,313	455,540	1.6%	5.3%	93.1%	100.0%
1990	6,558	28,025	460,643	495,226	1.3%	5.7%	93.0%	100.0%
1991	5,631	48,610	576,230	630,471	0.9%	7.7%	91.4%	100.0%
1992	6,306	48,276	558,441	613,023	1.0%	7.9%	91.1%	100.0%
1993	6,935	39,651	514,840	561,426	1.2%	7.1%	91.7%	100.0%
1994	7,638	22,785	499,624	530,047	1.4%	4.3%	94.3%	100.0%
1995	5,260	20,276	457,803	483,339	1.1%	4.2%	94.7%	100.0%
1996	1,908	22,915	537,552	562,375	0.3%	4.1%	95.6%	100.0%
1997	2,243	20,992	521,016	544,251	0.4%	3.9%	95.7%	100.0%
1998	4,413	20,112	486,522	511,047	0.9%	3.9%	95.2%	100.0%
1999	3,973	25,321	501,792	531,086	0.7%	4.8%	94.5%	100.0%
2000	4,234	27,578	503,996	535,808	0.8%	5.1%	94.1%	100.0%
2001	3,278	26,263	463,519	493,060	0.7%	5.3%	94.0%	100.0%
2002	7,989	15,900	443,058	466,947	1.7%	3.4%	94.9%	100.0%
2003	7,553	14,518	498,359	520,430	1.5%	2.8%	95.8%	100.0%
2004	8,433	13,712	597,716	619,861	1.4%	2.2%	96.4%	100.0%
% Average Annual Change								
1980-1990	3.6%	1.5%	-0.8%	-0.7%	4.3%	2.2%	-0.2%	0.0%
1990-2000	-4.3%	-0.2%	0.9%	0.8%	-5.0%	-0.9%	0.1%	0.0%
2000-2004	18.8%	-16.0%	4.4%	3.7%	14.5%	-19.0%	0.6%	0.0%
1990-2004	1.8%	-5.0%	1.9%	1.6%	0.2%	-6.5%	0.3%	0.0%
1980-2004	2.6%	-2.3%	0.7%	0.7%	1.9%	-3.0%	0.1%	0.0%

Sources: FAA 2005 Terminal Area Forecast; Airport records.



**Figure 4-3
Historical Annual Enplaned Passengers (1980 - 2004)**

West Air/United Express provided schedule service with flights to Fresno, San Francisco and Los Angeles with frequencies up to seven departures per day with BAe Jetstream aircraft. Mesa Airlines currently provides two daily departures to Las Vegas (North Las Vegas Airport) with Beech 1900 aircraft. Modesto provides four daily departures to San Francisco International Airport, from which passengers have the ability to connect to locations throughout the nation and world. Fresno has the most diverse service, with 50 daily departures to nine cities by 11 airlines, as follows:

Destination City From Fresno	Daily Departures	No. of Airlines
Dallas (DFW)	2	1
San Francisco (SFO)	8	1
Denver (DVX)	4	1
Los Angeles (LAX)	17	4
Phoenix (PHX)	5	1
Salt Lake City (SLC)	5	1
Las Vegas (LAS)	6	2
Portland (PDX)	1	1
Seattle (SEA)	2	1
Total	50	

Four of these airports (DFW, LAX, PHX, and SFO) provide broad connecting opportunities for air travelers.

Mesa Airlines service to Merced is subsidized under the U.S. Department of Transportation's Essential Air Service Program (EAS). The EAS provides annual payments directly to the airline and Mesa's agreement is currently negotiated through August 2008. At that time, DOT will re-bid the service and may receive new proposals from other airlines. Mesa will have the opportunity to submit a proposal as part of the process. Merced qualifies for the subsidy due to its distance from a large or medium hub airport. Funding for the EAS has been reduced over time, and it is possible that the airport could lose its present subsidy in the future.

Air fares to popular destinations are generally more expensive from CMA airports than from other more distant airports outside the CMA. For example, Table 4-14 illustrates comparative air fares to major destinations from airports in the CMA and other airports outside the CMA that are used by CMA passengers.

**Table 4-14
COMPARATIVE ROUND TRIP
AIRFARE FROM SELECTED AIRPORTS**

Round Trip			Lowest Fare
From	To		
Merced	to Las Vegas	\$	238
San Francisco	to Las Vegas	\$	305
Fresno	to Los Angeles	\$	535
San Francisco	to Los Angeles	\$	424
Oakland	to Los Angeles	\$	183
Fresno	to Phoenix	\$	795
San Francisco	to Phoenix	\$	369
Fresno	to New York	\$	533
San Francisco	to New York	\$	468
Fresno	to Portland	\$	569
San Francisco	to Portland	\$	294

Source: Expedia.com

Given the fare differentials and larger selection of flight options at large commercial service airports outside of the CMA, a significant number of passengers choose to travel via surface transportation to large commercial service airports in the Bay Area (San Jose International Airport – 124 miles northwest of Merced, San Francisco International Airport - 137 miles northwest of Merced, and Oakland International Airport - 115 miles northwest of Merced) or Sacramento (Sacramento International Airport - 128 miles north of Merced). These airports are generally 120 to 140 miles from Merced, versus the 65 miles from Merced to Fresno. The airports provide multiple airlines with a broad range of domestic and international flights, as follows:

Airport	Avg. Daily Departures	No. of Airlines
San Francisco	1,000+	40+
Oakland	200+	12
San Jose	190	15
Sacramento	150	14

This export of passengers to airports outside the CMA, or "leakage" was estimated by statistically evaluating the relationship between domestic enplanements per capita in California, adjusted for CMA economic and population conditions. This evaluation resulted in a regression model that explains the observed differences in enplaned passengers per capita using non-farm employment, population and the statewide average cost of

air travel, with an adjustment since 2001 for the effects of 9/11. Applying the model to CMA population results in the estimates of total passenger activity and leakage from the CMA which are presented in Table 4-15. The analysis indicates that between 70 percent and 80 percent of air passenger enplanements generated in the CMA are using airports outside the CMA. This level of leakage is consistent with other areas served primarily by regional/commuter service that have alternative full service airports within a reasonable distance.

Factors Affecting Enplaned Passenger Demand

Demand for enplaned passengers at airports in the CMA will be driven by a variety of factors, including:

- Population and economic growth in the CMA.** According to forecasts prepared by NPA Data Services, adjusted to reflect the impacts from UC Merced as described below, between 2004 and 2026 the CMA is expected to experience strong growth in population, total jobs, non-farm jobs and personal income (see Table 4-16). The projected rate of growth is forecast to exceed the rate of growth in both California and the U.S., leading to the CMA representing a greater share of population, employment and income relative to the state and nation. In particular, as urbanization and development of the Central Valley continues, the economy of the region will strengthen in the non-farm sector. As income from these jobs is generally higher than farm employment, total personal income is expected to increase dramatically. As discussed below, a significant contributor to this growth will be UC Merced.

**Table 4-15
ESTIMATED ENPLANED PASSENGER
LEAKAGE MERCED CMA: 1981 - 2004**

Year	CMA Airport Enplanements	Total CMA Enplanements	Leakage	% Leakage
1981	354,081	1,084,248	730,167	67.3%
1982	376,618	1,122,875	746,257	66.5%
1983	443,615	1,205,163	761,548	63.2%
1984	486,626	1,206,145	719,519	59.7%
1985	441,770	1,326,866	885,096	66.7%
1986	447,584	1,469,435	1,021,851	69.5%
1987	513,983	1,621,310	1,107,327	68.3%
1988	429,576	1,637,313	1,207,737	73.8%
1989	455,540	1,663,972	1,208,432	72.6%
1990	495,226	1,798,537	1,303,311	72.5%
1991	630,471	1,877,446	1,246,975	66.4%
1992	613,023	1,929,089	1,316,066	68.2%
1993	561,426	1,909,136	1,347,710	70.6%
1994	530,047	2,004,546	1,474,499	73.6%
1995	483,339	2,114,988	1,631,649	77.1%
1996	562,375	2,137,567	1,575,192	73.7%
1997	544,251	2,181,949	1,637,698	75.1%
1998	511,047	2,226,818	1,715,771	77.1%
1999	531,086	2,379,263	1,848,177	77.7%
2000	535,808	2,442,761	1,906,953	78.1%
2001	493,060	2,003,112	1,510,052	75.4%
2002	466,947	2,290,871	1,823,924	79.6%
2003	520,430	2,252,696	1,732,266	76.9%
2004	619,861	2,511,874	1,892,013	75.3%

Source: DMJM Aviation.

**TABLE 4-16
POPULATION, EMPLOYMENT AND INCOME IN THE CMA, CALIFORNIA AND UNITED STATES
1980-2004, 2011, 2016 AND 2026**

year	Population (000s)			Non-Farm Employment (000s)			Total Personal Income (millions of constant 2000 dollars)		
	US	California	CMA	US	California	CMA	US	California	CMA
Historic									
1980	227,226.4	23,792.9	996.5	110,431.7	12,495.5	440.0	4,479,990	554,297	19,944
1981	229,467.2	24,286.0	1,022.4	111,552.2	12,693.6	443.0	4,605,114	570,575	19,225
1982	231,665.9	24,820.1	1,046.1	110,898.3	12,630.2	437.7	4,642,410	575,682	19,164
1983	233,793.4	25,360.1	1,075.5	112,174.5	12,929.2	444.0	4,739,997	593,508	19,233
1984	235,826.4	25,844.4	1,102.6	117,420.5	13,583.8	459.0	5,077,716	641,113	20,848
1985	237,925.2	26,441.1	1,129.1	121,044.0	14,105.8	474.3	5,268,187	673,235	21,939
1986	240,134.7	27,102.3	1,153.6	123,644.4	14,544.7	485.4	5,434,932	702,287	22,948
1987	242,290.6	27,777.2	1,187.3	127,138.9	15,149.2	512.5	5,586,896	732,571	24,283
1988	244,500.8	28,464.2	1,226.7	131,234.7	15,864.2	533.7	5,798,536	764,672	25,072
1989	246,820.5	29,218.2	1,275.5	134,038.6	16,280.7	552.2	5,983,845	792,245	26,304
1990	249,624.3	29,959.6	1,331.1	136,271.7	16,708.2	582.2	6,098,760	818,366	27,493
1991	252,982.4	30,470.8	1,373.9	135,549.0	16,605.3	596.3	6,090,049	805,338	27,491
1992	256,515.7	30,974.7	1,409.6	136,243.4	16,272.7	595.6	6,273,003	818,536	28,263
1993	259,920.1	31,275.0	1,441.8	138,864.2	16,233.8	605.4	6,380,004	813,798	28,734
1994	263,127.2	31,484.5	1,467.5	142,479.7	16,427.4	616.5	6,565,998	821,095	28,749
1995	266,279.7	31,696.6	1,480.9	146,258.2	16,809.3	633.5	6,761,251	842,350	28,802
1996	269,395.5	32,018.9	1,501.3	149,540.1	17,213.5	646.8	6,988,891	868,417	29,575
1997	272,648.4	32,486.0	1,524.0	153,127.4	17,564.2	650.6	7,265,264	903,433	30,225
1998	275,855.6	32,987.7	1,545.8	157,086.8	18,220.1	670.1	7,698,621	966,602	31,684
1999	279,217.2	33,499.2	1,573.6	160,291.4	18,681.3	684.4	7,945,567	1,015,899	32,589
2000	282,403.1	34,010.4	1,604.7	164,275.1	19,328.7	704.9	8,365,633	1,095,603	33,669
2001	285,318.0	34,578.7	1,642.6	164,563.5	19,533.4	710.7	8,472,033	1,102,382	34,356
2002	288,156.3	35,002.0	1,684.1	164,060.8	19,559.0	732.8	8,610,715	1,116,393	37,233
2003	290,828.9	35,484.5	1,725.4	163,956.4	19,426.3	719.3	8,647,940	1,120,555	36,607
2004	293,846.6	35,850.1	1,732.9	167,721.2	20,189.3	760.6	9,152,116	1,195,989	39,669
Forecast									
2011	315,388.3	39,322.5	1,965.1	192,665.9	23,702.4	904.0	11,675,306	1,560,406	55,276
2016	331,836.7	41,908.7	2,153.2	207,164.7	25,810.6	996.1	13,337,170	1,799,036	66,123
2026	369,627.0	47,632.4	2,469.9	230,433.8	29,282.9	1,137.1	16,755,828	2,291,123	88,548
% Average Annual Change									
1980-1990	0.9%	2.3%	2.9%	2.1%	2.9%	2.8%	3.1%	4.0%	3.3%
1991-2000	1.2%	1.2%	1.7%	2.2%	1.7%	1.9%	3.6%	3.5%	2.3%
2000-2004	1.0%	1.2%	1.8%	0.6%	1.1%	2.3%	2.6%	2.8%	4.9%
1980-2004	1.1%	1.7%	2.3%	1.8%	2.0%	2.3%	3.0%	3.3%	2.9%
2004-2011	1.0%	1.3%	1.8%	2.0%	2.3%	2.5%	3.5%	3.9%	4.9%
2011-2016	1.0%	1.3%	1.8%	1.5%	1.7%	2.0%	2.7%	2.9%	3.6%
2016-2026	1.1%	1.3%	1.4%	1.1%	1.3%	1.3%	2.3%	2.4%	3.0%

Source: NPA Data Services; DMJM Aviation

- **U.C. Merced.** The 2005 opening of the new University of California campus in Merced will affect both the number and type of population and employment in the City and CMA. Based on the EIR prepared for the UC Merced Development Plan, at build out in 2030 the campus will serve 25,000 students and provide 6,300 direct jobs. An additional 7,000 indirect/induced jobs are expected to be created by support and spin-off activity generated by the campus. Further, between new students and non-local employees and dependents that could move to new jobs generated by the campus, an additional 48,000 people are expected to live in the CMA at build out of UC Merced. It was assumed that the campus would achieve 50 percent build out by 2016 for purposes of estimating the effects of UC Merced on population, employment and income in the CMA and will reach 100 percent buildout by 2026.
- **Level of Service.** As noted above, commercial service airports in the CMA provide relatively limited regional/commuter airline service to airports in the western United States. The majority of these destination airports provide a broad range of connecting opportunities to domestic and international destinations. Given the CMA's proximity to four major commercial airports (San Francisco, San Jose, Sacramento, and Oakland), it is likely that CMA airports will continue providing regional service, although opportunities for expanded activity and additional destination airports should appear as the area continues to grow.
- **Cost of Air Travel.** Overall, the cost of air travel has declined over the years. According to the FAA, this trend is expected to continue through the forecast period, with the national cost of traveling by air, as measured by revenue per passenger mile (yield), projected to decline by 0.9 percent per year over the period. While the cost of traveling from CMA airports is higher than the national or state average, this trend should be reflected in lower air travel costs in the CMA. Air travel costs from CMA airports should be further reduced if additional service is developed in the CMA.

CMA and Merced Municipal Airport Enplaned Passenger Demand Forecast

Enplaned passengers are projected to increase from 8,433 in 2004 to 52,818 in 2026 under the Baseline Forecast; 104,452 under the High Growth Forecast; and, 14,828 under the Low Growth Forecast.

Three scenarios were developed to estimate the potential range of future demand for enplaned commercial passengers in the CMA:

- **Baseline Forecast:** The Baseline Forecast assumes (1) overall enplaned passenger demand in the CMA will increase due to population and employment growth and declining costs of air travel, (2) the CMA will capture an increasing share of the overall CMA market for enplaned passengers consistent with trends experienced since 2000, and (3) Merced will capture an increasing share of the enplaned passenger demand at CMA airports consistent with trends experienced since 1980. This scenario reflects conditions where Merced will continue to support regional commercial service with some potential increase due to anticipated demand generated by UC Merced and associated development.
- **High Growth Forecast:** The High Growth Forecast assumes the Baseline Forecast in terms of overall CMA enplaned passenger demand and capture by CMA airports, but assumes Merced's capture of CMA airport demand increases at the rate experienced between 1980 and 1990. This scenario reflects conditions where increased demand generated by the development of UC Merced and associated activity is sufficient to attract regional airline service to additional destinations, such as SFO, LAX, or other major connecting airports.
- **Low Growth Forecast:** The Low Growth Forecast assumes the Baseline Forecast level of overall CMA enplaned passenger demand, but assumes the capture rates experienced at CMA airports and Merced Municipal remain constant at 2004 levels.

Using this approach, the total number of enplaned passengers in the CMA and Merced Municipal Airport under the Baseline, High Growth and Low Growth Forecasts are shown in Table 4-17.

**Table 4-17
PROJECTED PASSENGER ENPLANEMENTS
CMA AND MERCED MUNICIPAL AIRPORT**

	CMA Enplanements			Merced Enplanements	
	Total	% Capture	At CMA Airports	% Capture of CMA	Total
Baseline					
2004	2,511,874	24.7%	619,861	1.4%	8,433
2011	3,190,846	29.2%	933,231	2.3%	21,293
2016	3,639,261	32.3%	1,176,959	2.6%	30,613
2026	4,416,808	38.1%	1,684,027	3.1%	52,818
High Growth					
2004	2,511,874	24.7%	619,861	1.4%	8,433
2011	3,190,846	29.2%	933,231	3.0%	28,239
2016	3,639,261	32.3%	1,176,959	4.1%	47,860
2026	4,416,808	38.1%	1,684,027	6.2%	104,452
Low Growth					
2004	2,511,874	24.7%	619,861	1.4%	8,433
2011	3,190,846	24.7%	787,413	1.4%	10,712
2016	3,639,261	24.7%	898,069	1.4%	12,218
2026	4,416,808	24.7%	1,089,946	1.4%	14,828

Source: DMJM Aviation.

Comparison with Other Forecasts

Three other enplaned passenger forecasts have been prepared for Merced. These forecasts - the 2005 Terminal Area Forecast (TAF) prepared by the FAA⁵, the 1999 Statewide Forecasts prepared by the California Department of Transportation (CALTRANS)⁶, and the 1990 Merced Municipal Airport Master Plan⁷ - are summarized in Table 4-18.

As may be noted, the FAA 2005 TAF anticipates no growth in enplaned passengers at Merced over the forecast period. The 1999 CASP is lower than the Baseline Forecast in both 2011 and 2016, while the 1990 Master Plan anticipated a higher level of enplanements by 2010 compared to the 2011 Baseline Forecast. However, the 1990 Master Plan anticipated a significantly higher level of enplanements by 2004 that actually occurred (28,000 versus 8,433). Overall, the current Baseline Forecast is more optimistic than other forecasts. However, the forecast is considered reasonable given current and anticipated conditions in the CMA, as discussed above.

⁵ FAA, 2005 Terminal Area Forecast Database, March 2005.

⁶ CALTRANS Aeronautics Program, 1999 Statewide Forecasts, The California Aviation System Plan, September 1999.

⁷ City of Merced, Merced Municipal Airport Master Plan Report, December 1990.

**Table 4-18
COMPARISON OF BASELINE ENPLANED PASSENGER
FORECAST WITH 2005 FAA TAF, 1999 CASP AND 1990
MERCED MASTER PLAN FORECASTS**

Item	Forecast				Master Plan Forecast Percent Above (Below) Other Forecast			
	2004	2011	2016	2026	2004	2011	2016	2026
Baseline	8,433	21,293	30,613	52,818	-	-	-	-
2005 TAF	7,404	7,384	7,384	N/A	14%	188%	315%	-
1999 CASP								
Low	9,640	11,480	12,860	N/A	(13%)	85%	138%	-
High	10,540	13,060	14,860	N/A	(20%)	63%	106%	-
1990 Master Plan	28,000	36,400	N/A	N/A	(70%)	(42%)	-	-

Sources: As noted.

MARKET ASSESSMENT FOR AIR CARGO

Air cargo service involved 446,000 enplaned pounds of cargo in 2004. This is projected to quadruple in the year 2026 under the Baseline Forecast; increase by a factor of 6 under the High Growth Forecast; and triple under the Low Growth Forecast.

Air cargo service at the airport is provided by Ameriflight, a feeder cargo airline for UPS' Oakland regional hub. Ameriflight provides 12 departures per week (two on each weekday and one on each weekend day), or 624 departures per year. In 2004, Ameriflight enplaned approximately 446,000 pounds of air cargo and deplaned approximately 14,000 pounds.

Merced's future air cargo role is likely to remain as a feeder to a regional hub. If sufficient demand were present to significantly upsize the aircraft serving the area, the upsized service would probably locate at Castle Airport. Ameriflight's outlook over the forecast period is for a modest increase in operations, on the order of one to two additional daily departures per day using equipment similar to existing service. Based on this outlook, three air cargo forecast scenarios were developed for the airport:

- **Baseline Forecast:** the Baseline Forecast assumes average weekly activity at the airport quadruples over the forecast period. The type of equipment and average cargo volumes per operation would remain unchanged.
- **High Growth Forecast:** the High Growth Forecast assumes average weekly activity at the airport increases by a factor of 6 over the forecast period. The type of equipment and average cargo volumes would remain unchanged.
- **Low Growth Forecast:** the Low Growth Forecast assumes average weekly activity at the airport triples over the forecast period. The type of equipment and average cargo volumes would remain unchanged.

Using this approach, the volume of enplaned air cargo at Merced Municipal Airport under the Baseline, High Growth and Low Growth Forecast is shown in Table 4-19. No other forecast of enplaned air cargo at the airport was available for review.

**Table 4-19
ENPLANED AIR CARGO FORECAST
MERCED MUNICIPAL AIRPORT 2004 - 2026**

	Cargo Departures	Lbs/ Departure	Enplaned Cargo (lbs)
2004	624	715	446,160
<u>Baseline Forecast</u>			
2011	936	715	669,240
2016	1,248	715	892,320
2026	2,496	715	1,784,640
<u>High Growth Forecast</u>			
2011	1,248	715	892,320
2016	1,872	715	1,338,480
2026	3,744	715	2,676,960
<u>Low Growth Forecast</u>			
2011	780	715	557,700
2016	936	715	669,240
2026	1,872	715	1,338,480

Source: DMJM Aviation.

FORECAST OF AIRCRAFT OPERATIONS

An aircraft operation, or movement, is defined as either a takeoff or landing with each operation being categorized as either local or itinerant. A local operation is one that is performed by aircraft that: (1) operate in the local traffic pattern or within sight of the airport; (2) are known to be departing for or arriving from flights in local practice areas within a 20-mile radius of the airport; or (3) execute simulated instrument approaches or low passes at the airport. Itinerant operations are all operations other than local.

Annual Operations

Annual aircraft operations for the years 1980 to 2004 are shown in Table 4-20. Annual aircraft operations at Merced Municipal Airport between 1980 and 2004 have declined over time. In 1980 the airport handled 77,833 operations, by 2004 the number had declined to an estimated 28,200 (the air traffic control tower ceased operation in 1985, the number of aircraft operations since then are estimated by the FAA).

The technique used to develop the forecast of annual operations was as follows:

Commercial passenger operations: Current passenger service is provided by 19 passenger Beech 1900 aircraft. It is reasonable to assume that as passenger levels increase, airlines serving the airport may choose to provide some longer range service using larger turboprop or regional jet aircraft. Therefore, passenger enplanements were converted to passenger aircraft operations using the following assumptions relative to future aircraft fleet mix and load factors:

- **Baseline and High Growth Forecast:** Larger regional jet or turboprop aircraft will enter the fleet serving Merced by 2011, accounting for 20 percent of operations by 2026 and increasing the average

aircraft size from 19 seats in 2004 to 25.2 seats in 2026. Average load factors will remain at 2004 levels, or 61 percent.

- **Low Growth Forecast:** The aircraft fleet and load factor will remain constant at 2004 levels.

**Table 4-20
ANNUAL AIRCRAFT OPERATIONS BY TYPE
MERCED MUNICIPAL AIRPORT 1980 - 2004**

Year	Itinerant			Local		Total
	Commercial	General Aviation	Military	General Aviation	Military	
1980	2,430	43,058	399	31,394	552	77,833
1981	4,359	35,295	242	28,349	1,348	69,593
1982	1,652	43,000	500	30,000	500	75,652
1983	2,000	39,000	475	31,000	475	72,950
1984	2,000	39,000	475	31,000	475	72,950
1985	5,680	17,500	2,000	17,000	0	42,180
1986	5,680	17,501	2,000	17,002	0	42,183
1987	5,288	16,000	200	16,000	0	37,488
1988	5,288	16,500	200	16,500	0	38,488
1989	5,288	17,000	200	17,000	0	39,488
1990	3,500	18,000	500	28,000	0	50,000
1991	4,730	18,000	500	28,000	0	51,230
1992	4,730	18,000	500	28,000	0	51,230
1993	8,230	18,000	500	28,000	0	54,730
1994	8,230	18,000	500	28,000	0	54,730
1995	8,230	18,000	500	28,000	0	54,730
1996	8,240	18,000	500	18,270	0	45,010
1997	2,600	10,000	500	15,000	0	28,100
1998	2,600	10,000	500	15,000	0	28,100
1999	2,600	10,000	500	15,000	0	28,100
2000	2,600	10,000	500	15,000	0	28,100
2001	2,600	10,000	500	15,000	0	28,100
2002	2,600	10,000	500	15,000	0	28,100
2003	2,600	10,000	500	15,000	0	28,100
2004	2,704	10,000	500	15,000	0	28,204

Commercial Cargo Operations: Commercial air cargo service is provided by twin engine Beech C99 turboprop aircraft with a 3,800 pound cargo capacity. The current cargo carrier estimates that an average of 1,500 pounds of air cargo per day, or approximately 715 pounds per departure, are enplaned at Merced. The aircraft also makes an intermediate stop at Modesto before completing its route at Oakland, where the cargo is transferred to large UPS aircraft. Given the nature of service at the airport and the presence of Castle Airport with its 11,000 foot runway 13 miles to the north, it is unlikely that larger cargo aircraft will serve the airport in the future. Therefore it was assumed that future service would be provided by similar type of aircraft, and the enplaned cargo volume was translated into operations assuming an average 715 pounds per departure. Total operations were forecast by doubling annual departures.

General Aviation Operations: General aviation aircraft operations were forecast by applying the current ratio of general aviation aircraft operations per based aircraft at Merced to future levels of based aircraft. The percent distribution of operations between local and itinerant was assumed to remain constant at 2004 levels.

Military Aircraft Operations: According to airport management, military aircraft operations are primarily large twin turboprop aircraft, such as C130 transports, practicing instrument approaches at the airport. The level of operations has remained relatively constant and is assumed to remain so in the future.

Castle Training School Operations: The training schools at Castle conduct touch-and-go and instrument approach practice operations at Merced. Recently training operations have experienced a large increase and now approximately 56,000 training operations a year occur at Merced. Training operations are anticipated to remain at these levels throughout the forecast period.

The results of the Baseline, High Growth and Low Growth Forecasts are shown in Table 4-21. Under the Baseline Forecast total annual operations at Merced are projected to increase from 84,204 in 2004 to 110,400 in 2026. Under the High Growth Forecast total annual operations are projected to reach 134,100 by 2026; under the Low Growth Forecast, operations increase slightly to 91,300 by 2026.

**Table 4-21
ANNUAL AIRCRAFT OPERATIONS BY TYPE
MERCED MUNICIPAL AIRPORT 2004 - 2026**

Year	Itinerant				Local			Total
	Commercial	General Aviation	Military	Castle Training Schools	General Aviation	Military	Castle Training Schools	
2004	2,704	10,000	500	5,600	15,000	0	50,400	84,204
Baseline Forecast								
2011	4,100	12,300	500	5,600	18,400	0	50,400	91,300
2016	5,200	14,200	500	5,600	21,400	0	50,400	97,300
2026	9,300	17,800	500	5,600	26,800	0	50,400	110,400
High Growth Forecast								
2011	5,500	14,600	500	5,600	22,000	0	50,400	98,600
2016	7,900	18,000	500	5,600	27,000	0	50,400	109,400
2026	16,000	24,600	500	5,600	37,000	0	50,400	134,100
Low Growth Forecast								
2011	3,400	10,600	500	5,600	15,900	0	50,400	86,400
2016	4,000	10,800	500	5,600	16,200	0	50,400	87,500
2026	6,300	11,400	500	5,600	17,100	0	50,400	91,300

Sources: FAA 2005 Terminal Area Forecast; DMJM Aviation.

Comparison with Other Forecasts

The 2005 FAA Terminal Area Forecast (TAF), 1999 Caltrans CASP, 1997 Merced COG RASP, and 1990 Merced Municipal Airport Master Plan also provide forecasts of aircraft operations for the airport. As may be noted in Table 4-22, the 2005 FAA TAF anticipates no growth in aircraft operations over the forecast period. The other three forecasts show significantly lower total levels of aircraft operations over the forecast period compared to the Baseline Forecast. However, this is due to the recent training operations reflected in this forecast. The annual growth rates reflected in the other forecast are lower than the rates projected in the Baseline Forecast. Considering the large range of differences between other forecasts for the airport, the current Baseline Forecast appears reasonable.

**Table 4-22
COMPARISON OF BASELINE FORECAST OF AIRCRAFT
OPERATIONS WITH FAA 2005 TAF, 1999 CALTRANS CASP,
1997 MERCED COG RASP, AND 1990 MASTER PLAN**

Item	Forecast				Master Plan Forecast Percent Above (Below) Other Forecast			
	2004	2011	2016	2026	2004	2011	2016	2026
Baseline	84,204	91,300	97,300	110,400	-	-	-	-
2005 TAF	28,100	28,093	28,093	N/A	201%	225%	246%	-
1999 CASP	42,800	49,000	54,000	N/A	97%	86%	80%	-
1997 Merced COG RASP	59,000	60,000	70,000	N/A	43%	52%	39%	-
1990 Master Plan	60,000	75,000	N/A	N/A	40%	22%	-	-

Sources: As noted.

Aircraft Operations by Type of Aircraft

Aircraft operations by type of aircraft were forecast based on the following assumptions:

- **Commercial Aircraft.** The assumptions for future commercial passenger and air cargo aircraft operating at the airport were outlined in the enplaned passenger and air cargo sections of this report.
- **General Aviation Aircraft.** Detailed information on the mix of general aviation aircraft operating at the airport is not available. The existing 2004 operations mix was developed through discussions with airport staff. The future mix is based on trends reflected in the forecast of based general aviation aircraft.
- **Military Aircraft.** According to airport staff, the primary military aircraft operating at the airport are C130 transports (a four engine turboprop aircraft) conducting instrument training. It was assumed this activity would continue into the future.
- **Training Operations.** Assumptions of types of aircraft based on discussions with Castle Training Schools.

Table 4-23 presents aircraft operations by type at the airport under the Baseline, High Growth and Low Growth Forecast.

Peak Hour Aircraft Operations

Peak hour operations were forecast for the average day of the peak month (ADPM). The peak month was assumed to account for approximately 10 percent of annual aircraft operations. The average day number of operations is obtained by dividing the peak month activity by 30 days. A peak hour factor of 12 percent of ADPM operations was applied to project peak hour operations. Table 4-24 presents the forecast of peak hour airport operations.

Aircraft Operations by Time of Day

Aircraft operations were forecast for the following time periods: day (between 7 a.m. to 7 p.m.); evening (between 7 p.m. and 10 p.m.); and night (between 10 p.m. and 7 a.m.). The assumed distribution of operations by time period was developed through discussions with airport staff and Castle Training Schools, and is shown in Table 4-25.

**Table 4-23
FORECAST OF ANNUAL OPERATIONS BY AIRCRAFT TYPE
MERCED MUNICIPAL AIRPORT 2004 - 2026**

	Estimated	Forecast		
	2004	2011	2016	2026
<u>Baseline Forecast</u>				
Commercial				
Multi Engine	2,704	3,988	4,932	8,438
Jet	0	112	268	862
Total	2,704	4,100	5,200	9,300
General Aviation				
Single Engine	21,777	25,252	28,622	35,031
Multi Engine	2,228	2,811	3,346	4,301
Jet	500	1,842	2,492	3,568
Helicopter	248	305	356	448
Other	248	490	783	1,251
Total	25,000	30,700	35,600	44,600
Training Operations				
Single Engine	42,840	42,840	42,840	42,840
Multi Engine	10,360	10,360	10,360	10,360
Jet	2,800	2,800	2,800	2,800
Total	56,000	56,000	56,000	56,000
Military	500	500	500	500
Total	84,204	91,300	97,300	110,400
<u>High Growth Forecast</u>				
Commercial				
Multi Engine	2,704	5,350	7,484	14,296
Jet	0	150	416	1,704
Total	2,704	5,500	7,900	16,000
General Aviation				
Single Engine	21,777	30,105	36,180	48,384
Multi Engine	2,228	3,351	4,230	5,941
Jet	500	2,196	3,150	4,928
Helicopter	248	364	450	619
Other	248	584	990	1,728
Total	25,000	36,600	45,000	61,600
Training Operations				
Single Engine	42,840	42,840	42,840	42,840
Multi Engine	10,360	10,360	10,360	10,360
Jet	2,800	2,800	2,800	2,800
Total	56,000	56,000	56,000	56,000
Military	500	500	500	500
Total	84,204	98,600	109,400	134,100

Table 4-23 (cont'd)
FORECAST OF ANNUAL OPERATIONS BY AIRCRAFT TYPE
MERCED MUNICIPAL AIRPORT 2004 - 2026

	Estimated	Forecast		
	2004	2011	2016	2026
<u>Low Growth Forecast</u>				
Commercial				
Multi Engine	2,704	3,400	4,000	6,300
Jet	0	0	0	0
Total	2,704	3,400	4,000	6,300
General Aviation				
Single Engine	21,777	22,857	23,058	24,095
Multi Engine	2,228	2,426	2,538	2,749
Jet	500	530	540	570
Helicopter	248	264	270	286
Other	248	423	594	799
Total	25,000	26,500	27,000	28,500
Training Operations				
Single Engine	42,840	42,840	42,840	42,840
Multi Engine	10,360	10,360	10,360	10,360
Jet	2,800	2,800	2,800	2,800
Total	56,000	56,000	56,000	56,000
Military	500	500	500	500
Total	84,204	86,400	87,500	91,300

Source: DMJM Aviation

**Table 4-24
FORECAST OF PEAK HOUR OPERATIONS
DURING THE AVERAGE DAY OF THE PEAK MONTH (ADPM)
MERCED MUNICIPAL AIRPORT 2004 - 2026**

	Estimated	Forecast		
	2004	2011	2016	2026
<u>Baseline Forecast</u>				
Annual Operations	84,204	91,300	97,300	110,400
Peak Month Percentage	10%	10%	10%	10%
Peak Month Operations	8,420	9,130	9,730	11,040
Days in Peak Month	30	30	30	30
ADPM Operations	281	304	324	368
Peak Hour Percentage	12%	12%	12%	12%
Peak Hour Operations	34	37	39	44
<u>High Growth Forecast</u>				
Annual Operations	84,204	98,600	109,400	134,100
Peak Month Percentage	10%	10%	10%	10%
Peak Month Operations	8,420	9,860	10,940	13,410
Days in Peak Month	30	30	30	30
ADPM Operations	281	329	365	447
Peak Hour Percentage	12%	12%	12%	12%
Peak Hour Operations	34	39	44	54
<u>Low Growth Forecast</u>				
Annual Operations	84,204	86,400	87,500	91,300
Peak Month Percentage	10%	10%	10%	10%
Peak Month Operations	8,420	8,640	8,750	9,130
Days in Peak Month	30	30	30	30
ADPM Operations	281	288	292	304
Peak Hour Percentage	12%	12%	12%	12%
Peak Hour Operations	34	35	35	37

Source: DMJM Aviation.

**Table 4-25
AIRCRAFT OPERATIONS BY TIME OF DAY
MERCED MUNICIPAL AIRPORT 2004 - 2026**

	Estimated	Forecast		
	2004	2011	2016	2026
<u>Baseline Forecast</u>				
7 am - 7 pm	72,902	79,572	85,212	97,526
7 pm - 10 pm	11,020	11,375	11,675	12,330
10 pm - 7 am	282	353	413	544
Total	84,204	91,300	97,300	110,400
<u>High Growth Forecast</u>				
7 am - 7 pm	72,902	86,434	96,586	119,804
7 pm - 10 pm	11,020	11,740	12,280	13,515
10 pm - 7 am	282	426	534	781
Total	84,204	98,600	109,400	134,100
<u>Low Growth Forecast</u>				
7 am - 7 pm	72,902	74,966	76,000	79,572
7 pm - 10 pm	11,020	11,130	11,185	11,375
10 pm - 7 am	282	304	315	353
Total	84,204	86,400	87,500	91,300

Source: DMJM Aviation.

FUEL FLOWAGE

Fuel flowage was projected using historic ratios of fuel flowage to annual operations by type: avgas; airline jet fuel; and retail (non-airline) jet fuel. These ratios were assumed to continue into the future and were applied to the number of commercial (for airline jet fuel), general aviation jet and multi engine (for retail jet fuel), and non-jet aviation (for avgas) operations to forecast fuel flowage as shown in Table 4-26.

Forecasted fuel flowage does not include training operations as it is assumed the pilots take on fuel at Castle Airport.

CONCLUSION

Three scenarios were developed to estimate a range of potential future aviation demand in this master plan. These were the Baseline, High Growth and Low Growth Forecasts. The Baseline Forecast was selected as the basis for the master plan for the following reasons.

- It reflects the commercial service and general aviation roles and types of uses identified for the airport by the Technical Advisory Committee.
- It represents the projected population, employment and income growth of the competitive market area relative to California and the U.S.
- It reflects conditions where Merced will continue to support commercial service and general aviation with some potential increase due to anticipated demand generated by UC Merced and associated development. It also reflects the ongoing urbanization and increased non-farm employment base.
- It provides demand levels deemed by the City, Technical Advisory Committee and planning team to be realistic estimates for planning future facilities and evaluating environmental and financial aspects of the master plan.

Table 4-26
FUEL FLOWAGE FORECAST
MERCED MUNICIPAL AIRPORT 2004 - 2026

	Actual	Forecast		
	2004	2011	2016	2026
<u>Baseline Forecast</u>				
Avgas (gallons)	72,238	76,630	87,916	108,957
Jet Fuel (gallons)				
Airline	87,147	132,139	167,590	454,471
Retail	67,887	115,796	145,305	195,854
Total	155,034	247,935	312,895	650,324
<u>High Growth Forecast</u>				
Avgas (gallons)	72,238	91,357	111,129	150,488
Jet Fuel (gallons)				
Airline	87,147	177,259	254,608	515,663
Retail	67,887	138,050	183,672	270,507
Total	155,034	315,309	438,280	786,169
<u>Low Growth Forecast</u>				
Avgas (gallons)	72,238	68,961	70,262	74,166
Jet Fuel (gallons)				
Airline	87,147	109,578	128,916	203,042
Retail	67,887	73,573	76,605	82,595
Total	155,034	183,151	205,520	285,637

Sources: Airport records (actual); DMJM Aviation (forecast).

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