
1. REGIONAL CONTEXT

This chapter describes the commercial air transportation service and the demand for air transportation in the Los Angeles region. In describing the relationship between air transportation and the regional economy, the chapter explains the growing importance of air transportation over other long distance modes for both passengers and freight. Given this background, the chapter then examines why airport improvements will be needed at Los Angeles International Airport (LAX) to satisfy future regional demand. This chapter also contains information on the use of other airports or modes of transportation to satisfy all of this demand, which provides a necessary context for the discussion of alternatives in Chapter 3, *Alternatives (Including Proposed Action)*.

1.1 The Region's Air Transportation System

The Los Angeles region is made up of five of the six counties that are members of the Southern California Association of Governments (SCAG): Los Angeles, Ventura, Orange, Riverside, and San Bernardino. Imperial County is not considered because of its remote location from Los Angeles. The five-county area considered in the Master Plan encompasses over 35,000 square miles and contains over 15 million people. The geographic size of the Los Angeles region coupled with the widespread distribution of population and employment has caused the evolution of a multi-airport system found in only a few large metropolitan areas.

1.1.1 Allocation of Air Service Among Regional Airports

The Los Angeles region's airport system comprises eight commercial service airports, as well as five military bases that have been converted or are being considered for conversion to civilian or joint use commercial service airports. These airports, listed in **Table 1-1**, Existing and Potential Commercial Service Airports in the Los Angeles Region, are also depicted in **Figure 1-1**, Existing and Potential Commercial Service Airports in the Los Angeles Region. There also are many general aviation airports in the region serving private (non-scheduled) aircraft. As discussed in Chapter 3, *Alternatives (Including Proposed Action)*, increased use of these airports by general aviation operations, or other users that they are capable of serving, is not a reasonable alternative to improvements at LAX.

In 1997, these commercial service airports served approximately 80.7 million total passengers. Of that number, 29 million passengers connected to flights to other destinations; 51 million began or ended their trips in the Los Angeles region (often referred to as "origin and destination" or "O&D" passengers). This represents a greater number of domestic O&D passengers than found in any other U.S. metropolitan region. The current use of these airports in terms of passenger and aircraft activity is shown below in **Table 1-2**, Los Angeles Region Airports Comparison of Air Passenger Service and Market Share.

LAX is the Los Angeles region's primary airport, serving 74.5 percent of total passengers (1997),² and providing all of the international air service and two-thirds of the domestic air service. As urbanization of the region has extended east and south over the past four decades, the LAX share of total air passenger demand has declined from 88 percent in 1960. The historical activity contained in **Table 1-3**, Historic Distribution of Passenger Activity Among Los Angeles Region Airports, shows the growing share of passenger activity served by the other regional airports, a trend expected to continue along with development in the Los Angeles region.

In 1960, Burbank was the principal secondary airport with over 11 percent of the region's passenger demand. Burbank's market share has declined to about 6 percent today. Ontario and John Wayne Airports have become important secondary airports, serving approximately 8 and 10 percent, respectively, of the region's air travel demand in 1997. The other four commercial airports in the region together account for 3 percent of the region's activity. Palm Springs' growth has paralleled the growth in population in that area, accommodating about 1.5 percent of the region's demand in 1997. Despite its relatively accessible location, Long Beach served just 0.8 percent of the region's passenger activity in 1997 due to aircraft noise issues and related litigation. Air service at Oxnard, a small outlying commercial airport, consists of commuter connections to LAX. In 1998, commercial service at Palmdale was discontinued by the sole remaining air carrier, United Express.

² As explained in Chapter 3, the base year for activity in the environmental analysis in this document is 1996; however, activity levels for other years are used throughout this chapter because they are the most up to date information and are needed to illustrate particular points.

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Table 1-1

Existing and Potential Commercial Service Airports in the Los Angeles Region

Primary Airport – the region's dominant international and domestic air service airport providing most of the region's air service.

- ◆ Los Angeles International Airport (LAX)

Secondary Airports – smaller airports that augment air service provided by the primary airport.

- ◆ John Wayne Airport (SNA)
- ◆ Ontario International Airport (ONT)
- ◆ Burbank-Glendale-Pasadena Airport (BUR)
- ◆ Long Beach Airport (LGB)
- ◆ Palm Springs International Airport (PSP)

Commuter Airports – provide connecting air service by offering commuter flights to the region's primary and secondary airports.

- ◆ Oxnard Airport (OXR)
- ◆ Palmdale Regional Airport (PMD) scheduled commercial passenger service ceased as of April 1998

Other Airports with Potential for Commercial Aviation Use – former military bases.

- ◆ San Bernardino International Airport (SBD)
- ◆ March Air Reserve Base (RIV) (March Inland Port)
- ◆ Naval Air Station Point Mugu (NTD) (possible joint use)
- ◆ Southern California Logistics Airport (VCV)
- ◆ Marine Corps Air Station El Toro (NZJ) - closed July 1999

Source: Landrum & Brown, 2000

Table 1-2

**Los Angeles Region Airports
Comparison of Air Passenger Service and Market Share**

Airport	1997		% Share	
	Passengers ¹	Departures ²	Passengers ¹	Departures ²
Los Angeles Int'l.	60,143,000	375,000	74.5%	72.1%
John Wayne	7,719,000	48,000	9.6%	9.2%
Ontario	6,296,000	44,000	7.8%	8.5%
Burbank	4,718,000	32,000	5.8%	6.2%
Long Beach	611,000	3,000	0.8%	0.6%
Palm Springs	1,179,000	13,000	1.5%	2.5%
Oxnard	62,000	3,000	0.1%	0.6%
Palmdale	19,000	2,000	0.02%	0.4%
Total	80,747,000	520,000	100.0%	100.0%

¹ Airport records (rounded to nearest thousand)

² LAX Master Plan, Chapter I

Source: Landrum & Brown, 2000



Los Angeles International Airport
 Master Plan EIS/EIR

Existing and Potential Commercial Service
 Airports in the Los Angeles Region

Figure
 1-1

Table 1-3

Historic Distribution of Passenger Activity Among Los Angeles Region Airports

Airport	Total Passengers (in Millions of Annual Passengers)					Percent Share				
	1960	1970	1980	1990	1997	1960	1970	1980	1990	1997
Los Angeles	6.06	20.78 ¹	33.04	45.81	60.14	88.0%	85.3%	82.4%	74.2%	74.5%
Ontario	0.02	0.87 ¹	2.00	5.42	6.30	0.3%	3.6%	5.0%	8.8%	7.8%
John Wayne	0.01	0.95 ¹	2.38	4.59	7.72	0.2%	3.6%	5.9%	7.4%	9.6%
Burbank	0.86	1.32 ¹	1.92	3.49	4.78	11.5%	5.4%	4.8%	5.7%	5.8%
Long Beach	0.00	0.89 ¹	0.16	1.46	0.61	0.0%	1.0%	0.4%	2.4%	0.8%
Palm Springs	0.00	0.27 ¹	0.52	0.92	1.18	0.0%	1.1%	1.3%	1.5%	1.5%
Oxnard	0.00 ⁵	0.00 ⁴	0.05 ²	0.49 ²	0.62	0.0%	0.0%	0.1%	0.1%	0.1%
Palmdale	0.00	0.00 ¹	0.01 ³	0.48	0.19	0.0%	0.0%	0.0%	0.1%	0.0%
Region Total⁶	6.95	24.23	40.08	61.78	80.75	100.0%	100.0%	100.0%	100.0%	100.0%

¹ Air Carrier and Military Forecasts, prepared by R. Dixon Speas Associates, Inc. for SCAG, July 1979
² Represents a ten-year average used as a 1992 baseline for OXR in the *NAWS Point Mugu Joint Feasibility Study*
³ LAWA records
⁴ Southern California Regional Aviation System Study, 1972
⁵ Estimated
⁶ Totals may not add due to rounding

Sources: SCAG unless otherwise noted; Landrum & Brown, 2000

1.1.2 The Role of Air Transportation in the Regional Economy

A key factor in the economic health of the region is the ability of transportation to keep pace with the growth in population and economic activity. The Los Angeles region is the largest center for manufacturing in the United States, the headquarters for many large corporations, an important worldwide tourist destination, and the center of the world's entertainment and movie industries. A well-developed network of essential transportation facilities currently sustains the population and economic activities of the region. In addition to the regional airport system, the region is served by two railroad lines, three major seaports, and an extensive highway system. Two key goals of the Regional Transportation Plan (RTP) prepared by SCAG, which identifies the need for improvement of all travel modes, are to satisfy the forecast demand for movement of people and cargo, and to maximize the international economic prominence of the region.

The role of airports in this transportation system and the region's economy is set forth in great detail in Chapter I of the Master Plan. As explained there, economic growth in the Los Angeles region depends on an adequate supply of air transportation and the air transportation business itself is an increasingly significant source of jobs and regional economic production. Business travel is increasingly dependent on air transportation, as more and more businesses function in a worldwide context. Proximity to a full-service hub (or gateway) airport is a significant corporate location criterion for many companies. Commercial airports directly and indirectly contribute to regional economic growth.

1.1.3 Regional Demand for Air Transportation

As shown in **Table 1-4**, Historic Air Transportation Activity in the Los Angeles Region, demand for air transportation has increased steadily over the past four decades as the region has grown and as flying has become an accepted and affordable mode of travel. Air cargo service – including traditional freight, express, and mail – has also grown dramatically during the period. According to SCAG, air transport is the fastest growing method of transporting goods in and out of the region.

1. Regional Context

Table 1-4

Historic Air Transportation Activity in the Los Angeles Region

Year	1960	1970	1980	1990	1999
Annual Passengers	6,941,000	24,278,000	40,022,000	61,681,000	85,313,000
Annual Cargo Tons	262,000 ¹	552,000	888,000	1,571,000	2,760,000

¹ 1965

Source: SCAG, 2000

Demand for all forms of transportation is most directly a function of local and regional demographic and economic factors. Consequently, the levels of passenger and aircraft activity are primarily measures of the population, employment, and personal income levels of the areas nearby, although they may also reflect the airline service, accessibility, facilities, and policies at these airports. These key factors directly affecting aviation demand in the Los Angeles region indicate that the historical growth in air transportation will continue over the next 15 years:

- ◆ Population – SCAG forecasts a 1.5 percent average annual rate of growth for the Los Angeles region during 1990-2015, with a projected 2015 population of 21.4 million.
- ◆ Employment - SCAG expects that employment will increase at the same rate as population, increasing the region's employment from 6.87 million in 1990 to 9.9 million in 2015.
- ◆ Income - SCAG estimates that per-capita personal income in the Los Angeles region will increase to \$26,550 in 2015, an average annual growth rate of 1.9 percent over a 25-year period.

Demand for air transportation of cargo is tied to both the level and the type of economic activity in the region. Some businesses, such as high-technology and Internet-based firms, have a higher propensity to ship goods by air. International trade is also increasingly and heavily dependent on air transportation of cargo. As these economic sectors have expanded and grown in importance in the Los Angeles region, cargo demand has grown accordingly. The total volume of air cargo in the five-county Los Angeles region increased 6.0 percent annually between 1988 and 1994, from 1.5 million tons to 2.15 million tons. This increase is especially notable since it occurred during a period of economic recession. Since 1994, the annual growth rate has been 6.8 percent, with 2.6 million tons of air cargo processed in the region in 1997.

1.1.3.1 Population Growth in the Los Angeles Region

The Los Angeles region is the second largest metropolitan area in the U.S., trailing only the greater New York City area, and accounting for nearly 6 percent of the national population and 50 percent of the population of the State of California. **Table 1-5**, 1993 Los Angeles Region Population Distribution by County, lists the population in the Los Angeles region and **Table 1-6**, Comparison Of U.S., California, and Los Angeles Region Population, shows the region's population growth relative to national population levels. Given SCAG forecasts of a 1.5 percent average annual rate of regional population growth in the period 1990 to 2015, the projected population for 2015 is 21.4 million residents.

Table 1-5

1993 Los Angeles Region Population Distribution by County

County	Regional Population	Percent of Region
Los Angeles	9,133,600	60.0
Orange	2,515,300	16.5
San Bernardino	1,546,000	10.2
Riverside	1,321,300	8.7
Ventura	693,900	4.6
Total Region	15,210,100	100.0

Source: Regional Economic Models, Inc., 2000

Table 1-6

Comparison of U.S., California, and Los Angeles Region Population

Year	United States Population	California Population	Percent of U.S.	Population of Los Angeles Region	Percent of California	Percent of U.S.
1970 Actual	203,982,310	20,044,220	9.8%	10,014,820	50.0%	4.9%
1980	227,225,620	23,792,840	10.5%	11,468,000	48.2%	5.0%
1990	249,399,350	29,903,190	12.0%	14,630,000	48.9%	5.9%
2000 Forecast	275,260,030	33,663,730	12.2%	17,105,000	50.8%	6.2%
2010	298,528,740	36,882,750	12.4%	19,884,000	53.9%	6.6%
2015	312,268	41,413	13.3%	21,374,000	51.6%	6.8%

Source: Woods & Poole Economics, Inc. SCAG, and U.S Census Bureau, 1996

Regional O&D passenger demand is based on the population of the region as a whole, but changes in demographics can shift the geographic distribution of passenger demand. The distribution of regional population and employment in the five-county Los Angeles region has been projected by SCAG. Los Angeles County is forecast to remain the most populous area in 2015, exceeding 11.9 million residents, a 34 percent increase in population over a 25-year period. The other counties will increase at the same or higher rate. Orange County’s population is expected to grow at about the same rate as that of Los Angeles County, reaching 3.2 million in 2015. San Bernardino and Riverside counties are forecast to double in population, reaching 2.7 million and 2.6 million people, respectively, by 2015. Ventura County population is forecast to increase population by approximately 250,000 to just over 900,000 people.

1.1.3.2 Economic Activity in the Los Angeles Region

Employment and per capita income - the other two key factors affecting aviation demand - illustrate the economic vitality of the Los Angeles region. SCAG forecasts indicate that employment will increase at 1.5 percent annually and per capita income will increase at 1.9 percent annually. The existing and projected Los Angeles region employment and per capita income levels are listed in **Table 1-7**, Los Angeles Region Employment and Per Capita Income, and **Table 1-8**, Basic Industry Employment in the Los Angeles Region, 1972 – 1997 (in 1,000s).

Table 1-8 summarizes employment growth in major industry sectors. Manufacturing jobs have claimed a steadily declining share of the employment base. Services, technology, tourism, entertainment, and international trade have outstripped manufacturing and national defense as important components in the region’s economy. These growing sectors are among the areas of economic activity that most heavily depend on air transportation.

1.1.3.3 Future Demand for Air Passenger and Cargo Transportation

Based on these demographic and economic factors, passenger demand for air transportation is projected to increase at an annual rate of between 3 and 3.8 percent, and cargo demand is projected to grow at 7.8 percent - almost double the passenger growth rate. The cargo forecast generally reflects the trend toward increased use of air cargo by the region’s businesses and residents. The growth of international trade and Internet sales, two driving forces behind the cargo growth (Internet sales in particular) is expected to increase the use of express package air freight.

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Table 1-7

Los Angeles Region Employment and Per Capita Income

Year	Los Angeles Region Employment ¹	Los Angeles Region Per Capita Income ¹	U.S. Per Capita Income ²
1975 Actual	4,515,000	\$13,832	\$15,195
1980	5,244,000	\$15,200	\$17,149
1985	5,968,000	\$15,870	\$18,995
1990	6,866,000	\$16,540	\$20,603
1995	N/A	N/A	\$21,500
2000 Forecast	7,743,000	\$21,190	\$23,119
2005	8,525,000	N/A	\$24,631
2010	9,364,000	\$24,310	\$26,184
2015	9,895,000	\$26,550	\$27,750

¹ SCAG; 1998

² Woods & Poole Economics 1998 desktop data files.

N/A = Not Available

Source: Landrum & Brown, 2000

Table 1-8

Basic Industry Employment in the Los Angeles Region, 1972-1997 (in 1,000's)

Industry Sector	1972	1992	1997	Growth			
				1972-1992		1992-1997	
				Number	%	Number	%
Professional Services	328.5	798.8	925.7	470.3	143.2%	126.9	15.9%
Diversified Manufacturing	673.9	721.8	763.3	47.9	7.1%	41.5	5.7%
Transportation & Wholesale Trade	329.5	526.5	561.5	197.0	59.8%	35.0	6.6%
Tourism/Entertainment	107.0	248.3	314.0	141.3	132.1%	65.7	26.5%
Defense-Related	250.1	236.2	153.0	-13.9	-5.6%	-83.2	-35.2%
Resource-Based	78.6	116.8	74.1	74.1	48.6%	-42.7	-36.6%
High Technology Mfg.	80.9	111.9	102.5	31.0	38.3%	-9.4	-8.4%
TOTAL	1,848.3	2,760.3	2,894.2	911.8	49.3%	133.8	4.8%

Source: SCAG (1972 & 1992 data); Center for the Continuing Study of the California Economy (1997 data); HR&A, Inc. Prepared by Landrum & Brown, 2000

The 1998 RTP prepared by SCAG forecast air passenger and cargo activity for the entire region. SCAG estimates that existing airport capacity in the region was approximately 100 Million Annual Passengers (MAP) as of 1995. SCAG's passenger forecasts for 2020 ranged from approximately 148 MAP to 170 MAP. The lower figure was based solely on projected population increases; the higher figure on the additional demand that would be created by airports converting to civilian commercial service and the regional employment induced by those new airports. The medium forecast of 157.4 MAP was chosen by SCAG as the preferred forecast for the RTP. SCAG forecasts indicate that regional air cargo demand will grow similarly from 2.9 million tons in 1996 to 7.5 million tons in 2015 and to 8.9 million tons in 2020.

International air cargo is forecast to grow even faster than international passengers, increasing from 30 percent of total cargo in 1996 (0.8 million tons) to 38 percent of the total by 2015 (2.9 million tons), a trend which reflects anticipated major growth in Asia-Pacific cargo activity over the next two decades. International air express is forecast to rise the fastest of all demand segments increasing 10 times from 16,316 tons in 1994 to 193,000 tons in 2015. Domestic air express is forecast to rise from 336,057 tons in 1994 to 1,376,000 tons in 2015.

The Master Plan forecasts indicate that O&D passengers in the region are expected to increase from approximately 53.0 MAP in 1994 to approximately 107.0 MAP in 2015. This is an annual growth rate of 3 percent. Including connecting passengers, the Master Plan forecasts that total regional demand will reach 146.5 MAP in 2015. This is an annual growth rate of 3.4 percent compared with the 3.8 percent

annual growth rate in the SCAG RTP forecast. (A background on aviation forecasting and details of these forecasts are also contained in the Master Plan, Chapter III, *Forecasts of Aviation Demand*.)

What all of these forecasts reveal is that the regional airport system must add capacity to meet the projected demand in order to sustain economic growth in the Los Angeles region. As explained in the following sections, failure to provide sufficient airport capacity to accommodate this activity would mean increasing levels of congestion and delay, and ultimately passenger and cargo air service going to other regions. As the region's economy continues to grow, its airport system must adapt to keep up and meet the air transportation demand.

1.2 The Nature of Demand for Air Transportation

Numerous factors influence the level and character of aviation demand. These factors are a result of global, national, and regional trends encompassing social, economic, political, environmental, technical, and industry events and circumstances. Regional demographic and economic factors, in particular, are generally acknowledged as primary influences on the local demand for aviation service. Regions with a larger population, more jobs and higher incomes translate into higher overall demand for air service. In a multi-airport system, this demand will not be distributed evenly among the region's airports. The allocation among airports is influenced by factors such as market accessibility and airline service. Given a choice, passengers and cargo shippers will use those airports that offer the best combination of accessibility and air service (including flight frequency and pricing).

The type and location of available air service, therefore, are as important as total capacity in meeting projected demand. The right kind of air service must be available in the right places and at the right time and at the right price to meet the specific needs of individuals and businesses. As this section describes, the nature of air transportation demand and of the airline industry are key factors in determining how and where the increasing demand for air transportation should be met. Decisions about infrastructure improvements at the existing commercial airports or construction of new airport facilities must take these factors into account.

Forecasts of aviation demand were conducted by SCAG and LAWA using a sophisticated computer model called Regional Air Demand Allocation Model (RADAM). RADAM analyzes not only population and employment, but also includes an analysis of the type of service, the supply of airline/airport services, and the relative accessibility to an airport. These forecasts help to predict, as this section describes, where in the region infrastructure improvements will be needed to meet the demand for air transportation. Complete background information on the RADAM model is provided in the Master Plan, Chapter III, *Forecasts of Aviation Demand*, and is available from SCAG.

1.2.1 Passenger Demand

This section examines the four basic elements that determine the demand for commercial air transportation at the region's airports. First, the characteristics of the passengers influence their decision criteria. Second is the relative accessibility of the airports in the region to the local points of O&D of the passenger demand. Third is the amount and type of airline service at each of the airports in the region. Fourth is the availability and quality of airport facilities at each of the region's airports. Collectively, these factors determine the level and character of passenger demand among the region's airports. The factors are presented in the following sections.

1.2.1.1 Passenger Characteristics

There were approximately 80 million annual passengers using the Los Angeles region's airports in 1997. One way to characterize these passengers is by their points of O&D. In this way, passengers can be characterized as local O&D or connecting. O&D passengers begin or end their trip in the Los Angeles region – they are either local residents traveling outside the region (origin) or visitors to the region (destination). Connecting passengers merely change planes at an airport and do not spend significant time in the region. Based on their points of O&D, passengers are also characterized as domestic or international. Of the 80 million passengers within the region in 1997, the majority (76 percent) were O&D passengers. Most of these O&D passengers were traveling to/or from other domestic cities. Passengers traveling to or from cities within 500 miles of Los Angeles represented the largest segment of passenger demand in the Los Angeles region (26.8 percent). The second largest passenger market segment is long-haul domestic including the East Coast, Alaska and Hawaii (24.2 percent). The next largest passenger market segment (24 percent) are connecting passengers. These passengers choose their

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travel route based on the air service provided by the airlines serving the region's airports. LAX is the primary connecting airport within the region. Recent passenger activity estimates of the region's airports are shown below in **Table 1-9**, 1997 Estimated Los Angeles Region Air Passenger Trips by Destination and Passenger Type.

According to the LAX Master Plan analysis using 1994 passenger data (the latest available), approximately 30 percent of LAX passengers were connecting passengers. Of these more than half (54 percent) were making an international trip.

Table 1-9

**1997 Estimated Los Angeles Region Air Passenger Trips
by Destination and Passenger Type**

Passenger Category	Passengers	% of Total
Origin/Destination Passengers		
Domestic		
Short Haul (western region)	21,492,000	26.8%
Medium Haul (mid-continent)	10,580,000	13.2%
Long Haul (east coast, Alaska & Hawaii)	19,365,000	24.2%
Domestic O&D Subtotal	51,437,000	64.2%
International	9,442,000	11.8%
Total Los Angeles Region O&D	60,879,000	76.0%
Connecting Passengers (domestic and international)	19,243,000	24.0%
Total Passengers	80,122,000	100.0%

Source: DOT (1997) 10% Ticket Sample (Data varies slightly from airport records).

Prepared by Landrum & Brown, 2000

The distribution of the region's O&D passengers generally mirrors where residents live and work and where visitors stay. As shown in **Table 1-10**, 1994 and 2015 Population, Employment and Domestic O&D Passenger Demand by County, the highest concentrations of O&D passengers are located in the counties with the highest levels of population and employment. Over 55 percent of the region's population and employment is forecast to be in Los Angeles County in 2015, while over 65 percent of the region's employment and domestic O&D is forecast to be in Los Angeles County. **Figure 1-2**, 2015 Concentration of Domestic O&D Passenger Demand in the Los Angeles Region, shows that the highest concentrations of O&D passengers in 2015 will continue to be centered on LAX.

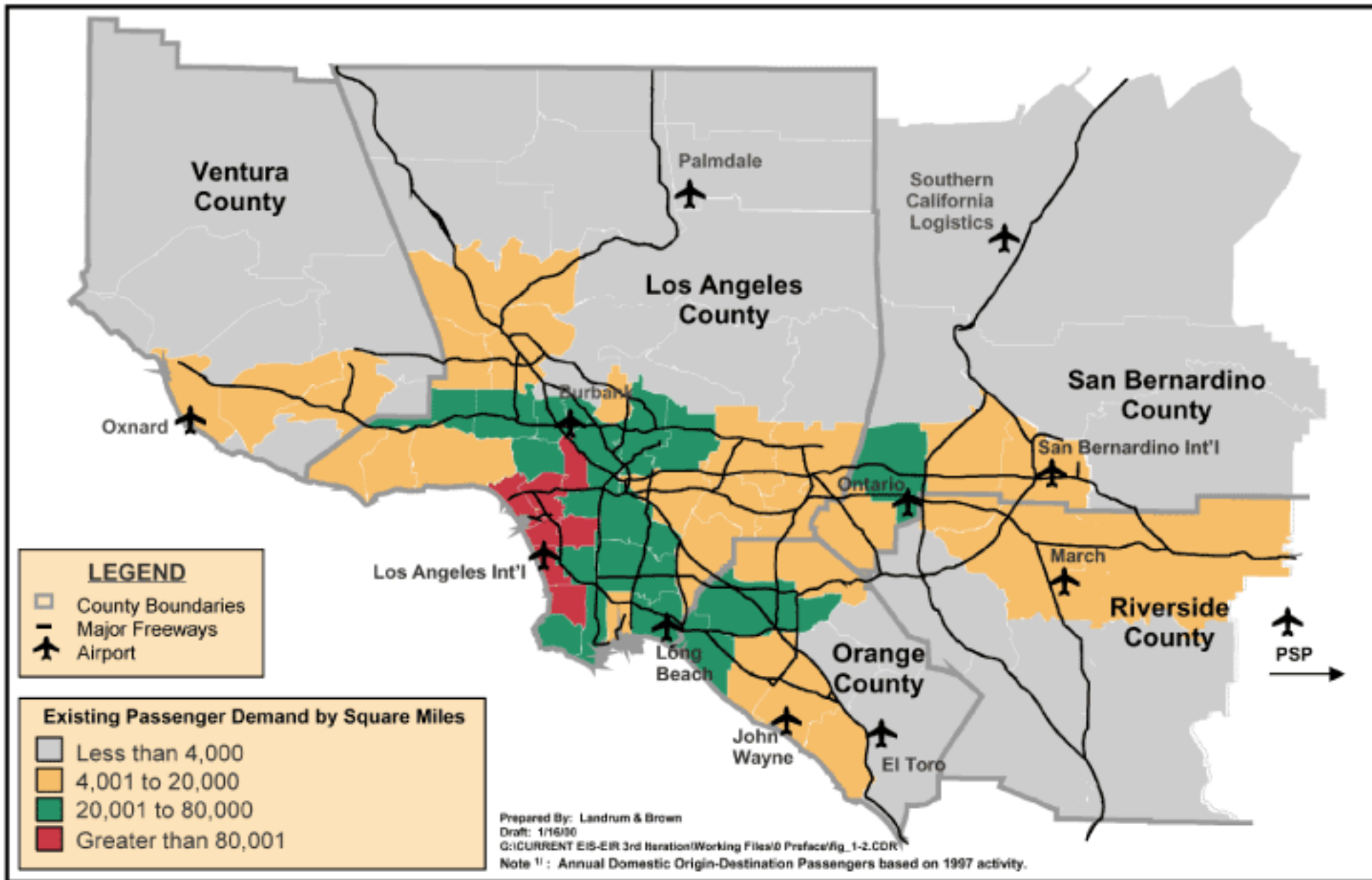
Table 1-10

**1994 and 2015 Population, Employment and Domestic O&D Passenger Demand
by County**

County	Population (% of Total)		Employment (% of Total)		Domestic O&D Passenger Demand			
	1994	2015	1994	2015	(% of Total)		MAP	
					1994	2015	1994	2015
Los Angeles	59.7	55.8	63.1	65.1	69.3	65.7	31.5	55.5
Orange	16.8	15.1	19.3	18.7	16.2	14.6	7.4	12.3
Riverside	8.9	12.3	5.9	5.5	4.9	8.3	2.2	7.0
San Bernardino	10.0	12.5	7.4	6.4	4.9	7.0	2.2	5.9
Ventura	4.6	4.3	4.3	4.3	4.7	4.4	2.1	3.7
Totals	100.0	100.0	100.0	100.0	100.0	100.0	45.5	84.5

Note: Some totals may not add due to rounding

Source: SCAG and Landrum & Brown, 2000



**Los Angeles International Airport
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**2015 Concentration of Domestic O&D
Passenger Demand in the Los Angeles Region**

Figure
1-2

Different kinds of travelers are influenced by different factors. Business travelers may be motivated primarily by convenience, while leisure travelers are often more sensitive to the cost of air travel. Airports and airlines both generally strive for a combination of business and leisure travelers. The frequent flights attractive to business travelers can be supported by airlines selling excess seats to tourists at lower fares. The synergy between business and leisure travelers enhances overall air service. In 1996, approximately 52 percent of the O&D passengers at LAX were leisure travelers and 46 percent were business travelers.

1.2.1.2 Market Accessibility

Because a large base of O&D passengers is the most important contributor to the service potential of an airport, market accessibility is critical to assessing local demand for air service. Unlike connecting passengers who are simply moving through the airport between flights and thus not concerned about the airport location, O&D passengers are influenced in their choice of airport by the distance and relative ease of travel to and from the airport.

The concept of “market accessibility” applies not only to the distance a passenger must travel, but also to the traffic conditions of the road system and the availability of alternative modes of travel to and from the airport. The geographic area in which an airport has a locational advantage – in other words, the area for which it is the most convenient airport – is referred to as a *catchment area*. The catchment areas for the Los Angeles region’s airports were identified based on the closest airport in terms of ground access travel time by private automobile, and are displayed in Chapter I of the Master Plan.

Another way to evaluate the general market potential of an airport is to identify the number of passengers located within 60 minutes ground travel time or “access zone” of an airport. The 60-minute “access zone” approach recognizes that passengers may bypass the absolutely closest airport in order to obtain more frequent service, lower fares, or more convenient facilities. The 60-minute access zones for the region’s airports are displayed on **Figure 1-3**, Los Angeles Regional Airport System Airport Travel Time Zones (60 Minute Accessibility).

1.2.1.3 Airline Service

Another factor influencing airport choice is the quality of air service. Passengers might opt to use a more distant airport that offers more frequent flights or point-to-point service over an airport that is closer. As discussed in more detail below, the type and level of air service at a given airport is determined by the collective business decisions of the airlines, generally in response to local O&D demand. As the frequency of service and number of destinations increase based on the strength of the local O&D market, an airport may draw passengers from outside its catchment area.

1.2.1.4 Airport Facilities

The type and condition of facilities at an airport affect its ability to accommodate both passengers and air service. An airport’s ability to accommodate existing and projected demand may be constrained by one or more of the following conditions:

- ◆ Airport Infrastructure – the size and condition of the airfield, terminal, ground access facilities, cargo facilities, federal inspection services, freight forwarding facilities, fueling systems, and other physical infrastructure elements
- ◆ Policy – the airport owner’s policies regarding future airport development and the utilization of existing facilities
- ◆ Environmental – significant environmental considerations that may limit airport activity or future development
- ◆ Airspace – airspace limitations due to terrain or interactions with other airports

In a multi-airport system where passengers, cargo operators, and airlines have alternatives, these conditions may result in certain airports failing to capture their potential market share.

1.2.2 Allocation of Air Service Among Regional Airports

The use of other regional commercial service airports, or “dispersal of growth” has been a primary consideration throughout the development of the Master Plan. That is, one often-mentioned approach to meeting the forecast growth in air transportation demand is to disperse demand to under-utilized airports

1. Regional Context

in the region. This section discusses how demand is distributed among regional airports on the basis of market forces.

Since passage of the federal Airline Deregulation Act of 1978, which terminated the functions of the Civil Aeronautics Board, the airlines, and not government, make the decision about which airports they will serve. As a general rule, airlines will choose to serve the airports near the highest concentrations of conveniently located customers. Within this general framework, however, airlines must make strategic decisions about air service to maximize their investments and gain competitive advantages. For instance, in regions with multiple airports, airlines tend to concentrate their air service at a single, well-located primary airport for reasons of economic efficiency. Concentrating service at a dominant airport also facilitates connecting service, which can significantly increase an airline's market and allow even greater frequency to more destinations. International service in particular relies on the availability of domestic connecting flights to a wide range of destinations.

Airlines will establish additional service at secondary airports in the region only if the local market generates sufficient demand. In some cases, secondary airports can offer a competitive advantage over a primary airport by reducing airline costs, or by providing more convenient access to and from a central business district or tourist destination. However, airlines may be reluctant to serve secondary airports even under these circumstances, if doing so will dilute their market share or significantly increase operating costs. An airline that attempts to shift service from one airport to another may instead end up losing that share of the market to a competitor.

Each of the commercial service airports in the regional system was analyzed in the Master Plan, Chapter I, *Air Transportation in the Los Angeles Region*, to determine its capacity and potential service level. General aviation airports were excluded from the analysis because 1) there are no existing commercial facilities and markets to build from; 2) all of the general aviation airports are constrained from large-scale expansion; and 3) there is a concern to avoid displacing general aviation operations from those busy facilities into other commercial-service airports in the region.

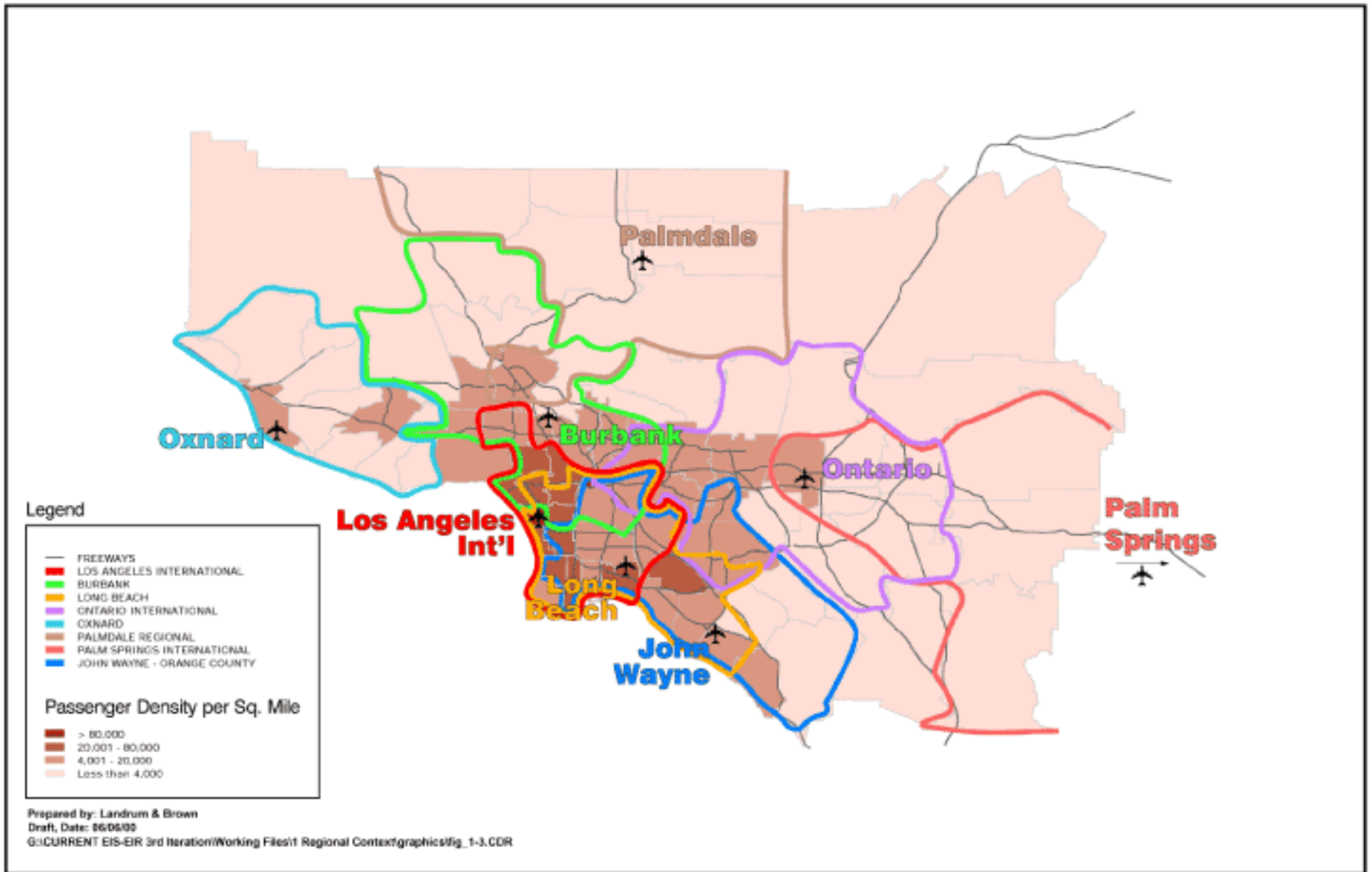
This chapter examined the existing and proposed facilities at the airports identified in **Table 1-1**, Existing and Potential Commercial Service Airports in the Los Angeles Region, and then analyzed the potential for additional air service at each airport, which would be needed to distribute demand throughout the region. Its analysis included consideration of historical levels of air service and physical constraints on airport expansion. The following is a summary of Chapter I's findings regarding the potential for additional air service at each of the region's commercial service airports.

1.2.2.1 Los Angeles International Airport

LAX has several historical and natural advantages over other commercial airports in the region. As the first jet facility in the region, it already was well established by the time the region had grown enough to support a multiple airport system. Many businesses in the region that depend on air transportation chose to locate near LAX and made substantial investments in facilities and improvements. The airport's proximity to the Los Angeles Central Business District is a great advantage and, although perhaps not the original intent, its proximity to the ocean has helped mitigate the effect of aircraft noise.

In 1997, LAX's scheduled air service accounted for approximately 72 percent of the region's departures. Two-thirds of the short- and medium-haul flights in the region originate at LAX, as do 87 percent of the region's long-haul flights. LAX also provides virtually 100 percent of the region's international air service, including the most air service to the Asia-Pacific region of any airport in North America and the third highest number of flights to Latin America.

In 1997, LAX handled a total of 60 million passengers, of which approximately 19 million were connecting passengers (primarily connecting between international and domestic flights). LAX was the origin or destination for another 9 million international passengers. Currently, LAX serves 74 percent of the air passenger demand and 78 percent of air cargo demand in the region. While the absolute numbers continue to grow at LAX, its share of the region's air transportation has been declining as the shares of Ontario and John Wayne airports have increased.



**Los Angeles International Airport
Master Plan EIS/EIR**

**Los Angeles Regional Airport System
Airport Travel Time Zones (60 Minute Accessibility)**

Figure
1-3

LAX's domestic O&D activity in 1997 was approximately 33 MAP, 7 MAP greater than the passenger market within the airport's 60-minute access zone; that is, it drew 7 MAP from outside its own access zone, from the access zones of the other regional airports. This higher level of activity probably is a result of the greater level of air service at LAX compared with other airports in the region. More than 80 U.S. and foreign airlines provide over 1,000 departures a day to more than 130 worldwide destinations from LAX, giving it a network of airline connections provided by no other airport in the region. Service to many destinations at a greater frequency tends to strengthen the competitiveness of an airport for O&D and connecting passengers. Connecting passengers contribute to higher aircraft load factors, allowing airlines to increase service and, in turn, benefit the O&D market.

The Master Plan forecasts that LAX will remain the airport accessible to most people in the region in 2015, with 52 percent (44 MAP) of the region's domestic O&D air travelers within its 60-minute access zone. (See **Figure 1-2** and **Figure 1-3**). Given that LAX has more airline service and more in-place facilities such as runways, terminals, customs, cargo processing, and other facilities than any other airport in the region, it is projected to remain as the region's primary international airport with or without any expansion of facilities.

This same projection can be made for LAX's cargo operations. LAX has the second highest volume of cargo in the U.S. Airlines, cargo shippers, and integrators have made major facility investments at LAX, and many more off-airport freight forwarding facilities are located nearby. However, the primary reason for LAX's dominance in cargo activity is the shippers' ability to rely on the major passenger air service network for cargo transport. Approximately 46 percent of LAX cargo is carried in the bellies of passenger aircraft. For international cargo, the percentage of belly cargo is about 52 percent. Because of the large number of cities that passenger airlines serve from LAX, cargo shippers can offer low cost, conveniently scheduled, worldwide cargo service without having to fly dedicated freighters to more remote or less popular destinations.

1.2.2.2 John Wayne Airport-Orange County

About 28 percent of the region's domestic O&D demand (23.8 MAP) in 2015 will be located within its 60-minute access zone, but only 5.6 MAP in its catchment area. The airport has only one relatively short air carrier runway (and a general aviation runway), limited facilities, no room for expansion, significant environmental constraints, and severe policy restrictions. A court order issued in 1985 restricts passenger activity to 8.4 MAP until 2005, and a recent voter initiative requires a two-thirds vote of the electorate to expand the airport. Based on these factors, the airport is expected to continue to provide service primarily to short-haul markets with limited service to major medium- and long-haul markets.

1.2.2.3 Marine Corps Air Station El Toro

This former military base was closed in July 1999, and Orange County is exploring its conversion to a civilian airport. The airport is well located to attract air travelers from the Orange County area as well as potentially drawing passengers from San Diego County. In the *County of Orange Airport System Master Plan*, March 1999, 15 percent of San Diego County air passengers currently use Los Angeles region airports. The airport's infrastructure with proposed improvements could support the El Toro Master Plan's projected activity levels of 23.4 MAP in 2015 and 28.8 MAP in 2020. Several factors, however, may limit the level of future air service at El Toro, as described more fully in Chapter I of the Master Plan, and as discussed above for John Wayne Airport. On March 7, 2000 voters in Orange County passed Measure F, which requires a two-thirds majority approval countywide by voters before an airport can be constructed or expanded. The measure will make the conversion of El Toro into a commercial airport substantially more difficult. As of August 2000, work on the environmental documentation has been suspended, project management is undergoing reorganization, and new project descriptions are being investigated.

1.2.2.4 Ontario International Airport

Ontario International Airport, owned by the City of Los Angeles and operated by LAWA, is located approximately 35 miles east of downtown Los Angeles. About one-third of the airport's 1,463 acres is available for future expansion. The airport is well located within the regional ground transportation system, lying between the I-10 Freeway on the north and the SR-60 Pomona Freeway on the south; it is also accessible via a well-developed system of arterial and local roadways. Ontario Airport has two parallel runways, both of which are capable of accommodating large jet aircraft, but are too closely spaced to permit independent aircraft arrivals. A new 26-gate terminal, which opened in 1998, was designed to allow for future expansion that would add 13 more jet gates.

1. Regional Context

Ontario's air service has grown over the past 15 years as development in the region has expanded into the eastern end of the Los Angeles region, known as the Inland Empire, and air travel demand in the area has correspondingly increased. The airport currently serves 16 non-stop markets: seven short-, six medium-, and three long-haul markets. Ontario provides 13 percent of the region's air service in the top 25 markets. Ontario's passenger activity in 1997 of 6.3 MAP was slightly larger than its catchment area of 5.9 MAP. This suggests that Ontario is fully serving its local market, and is drawing 0.4 MAP from other airports that share portions of its 60-minute access zone. In 1997, Ontario's scheduled air service accounted for approximately 8 percent of the region's departures. The cargo volume at the airport in 1997 was 461,747 tons.

Ontario's catchment area, is forecast to include 11.7 MAP in 2015. An additional 3 MAP will be within the airport's 60-minute access zone, but closer to LAX. (Ontario and LAX share portions of their 60-minute access zone.) The airport has runways and a new terminal that provide capacity for growth. The local community supports its growth, and Ontario has the potential to capture a larger share of total regional demand.

1.2.2.5 Burbank-Glendale-Pasadena Airport

Burbank's catchment area is the second largest in the region, with 17.7 percent of domestic O&D demand (14.9 MAP in 2015), and approximately 24 million domestic air travelers projected to originate their trips within the 60-minute access zone in 2015. However, the SCAG forecast shows Burbank with an activity level of only 9.2 MAP in 2020. The forecast, prepared as part of the recently completed terminal study, estimates that the new terminal will handle approximately 10 MAP in 2010. Both of these forecasts took into account the physical constraints of the airport's infrastructure and the policy constraints of the governing body that owns the airport. Accordingly, the airport has environmental, physical, and policy constraints that will severely limit its ability to fully serve the demand potential of its market area.

1.2.2.6 Long Beach Airport

Approximately 43 percent of the region's domestic O&D market is projected to fall within Long Beach's 60-minute access zone by 2015, making it the airport accessible to the greatest number of the region's O&D passengers after LAX. However, the catchment area for Long Beach overlaps the 60-minute access zones for LAX and John Wayne Airport, both of which have more extensive existing airline service. Long Beach's potential to attract additional passenger activity is further constrained by the current City of Long Beach policy limiting air carrier flights to 41 per day.

1.2.2.7 Palm Springs International Airport

This airport is located 105 miles from Los Angeles in Riverside County, at the edge of the Los Angeles region, and is a resort destination--not an alternative arrival location for Los Angeles. Palm Springs' air service is limited to commuter service and some long distance resort-oriented service.

1.2.2.8 Airports in Ventura County (Oxnard Airport and Naval Air Station (NAS) Point Mugu)

These airports are located approximately 65 miles from downtown Los Angeles. Oxnard's catchment area in 2015 is forecast to contain 3.9 MAP. As the area's population and employment increase over the next 20 years, Oxnard has the potential for expanded air service. The airport consists of a single short runway with limited terminal, parking, and ground access facilities. Increased air service at Oxnard will depend primarily on local demand and the willingness of airlines to establish service to other markets.³

Nearby NAS Point Mugu has more extensive airfield facilities with greater potential capacity. Point Mugu's air carrier-length runways could accommodate commercial service by jet aircraft under a joint use agreement, although terminal and ground access facilities would need to be developed to facilitate commercial air service. While feasibility studies have been conducted, NAS Point Mugu has not been designated for closure or realignment pursuant to the Defense Base Closure Act of 1990, and this facility is presently not available for civilian use.

³ In addition, the airport sponsor has no plans to improve airport facilities, thus limiting the airport's potential to provide direct service to most markets.

1.2.2.9 San Bernardino International Airport

San Bernardino's primary market area overlaps with much of the existing catchment areas of Ontario and Palm Springs. San Bernardino International Airport is 23 air miles east of Ontario International Airport. The close proximity of these two airports and the fact that Ontario has established air service with additional unused capacity makes the establishment of passenger service at San Bernardino International more difficult. Terminal facilities have been improved and the airport is attempting to attract passenger service. Currently it serves only as an aircraft maintenance facility. Its potential to attract air service is dependent on its ability to compete with well-established service at other airports, and with proposed commercial air service at March Air Reserve Base/March Inland Port.

1.2.2.10 Southern California Logistics Airport

Southern California Logistics Airport is located in San Bernardino County near the City of Victorville along I-15 approximately 100 miles northeast of LAX. The airport is currently focusing its efforts on attracting cargo activity.

1.2.2.11 March Air Reserve Base/March Inland Port

This is a civilian/military joint use facility located 65 miles east of the Los Angeles downtown and within Ontario Airport's current catchment area. Three hundred acres have been set aside for commercial cargo operations with the name of March Inland Port. It is currently marketed only for cargo operations. Consequently, its ability to attract scheduled passenger air service is untested and uncertain.

1.2.2.12 Palmdale Regional Airport

Palmdale Regional Airport is located on leased land of the Air Force at the Palmdale Production/Test Installation Air Force Plant No. 42, a military installation. This facility is separate and apart from the adjacent 17,000 acres purchased by the City of Los Angeles in the 1960s for future airport development. Civilian use of the Plant 42 airfield is permitted under a joint use agreement with the Air Force. The airfield includes two air carrier-length runways. The terminal facilities on the Plant 42 property consist of one 9,000 square foot terminal with two aircraft parking positions. The terminal includes eight counter spaces for airline passenger check-in, a passenger screening area, and baggage claim area. Presently, the terminal building is being upgraded and improved including new paint, new carpeting, new air conditioning, and roof repairs. Interior terminal restoration and upgrade will be completed by December, 2000. The automotive parking area located immediately west of the terminal has approximately 300 parking spaces. The airport is approximately 61 miles from the Los Angeles Central Business District with access from State Route 14 (no direct freeway access is provided).

Conceptual Plan

LAWA's conceptual plan for Palmdale consists of aircraft parking improvements of up to 600,000 square feet for a new passenger terminal building to accommodate widebody aircraft with space for 33 aircraft parking positions, 9,000 public parking spaces, 600 employee parking spaces, and a cargo terminal, including warehouse space and four aircraft parking positions. The plan was designed in phases to be implemented when demand reaches certain thresholds.

Joint Use Agreement with U.S. Air Force (USAF)

In 1989, LAWA and the USAF entered into a Joint Use Agreement for military and civil aircraft operations at Air Force Plant 42, which permits LAWA to use runways at the adjacent Air Force Plant 42 for up to 50 operations per day. The agreement defers the construction of runways or flight facilities on LAWA property until civil aircraft use at Plant 42 exceeds a three-month average of 200 operations per day, with provisions for this minimum to be raised to 400 per day. The USAF will permit facility improvements on Plant 42 property if they do not conflict with Plant 42's current installation Master Plan, if they are in accordance with USAF airfield criteria, and if they are compatible with current and foreseeable USAF flight operations. The agreement stipulates that all facility improvements to be made by LAWA must be specifically approved by the USAF.

The USAF is cooperating with LAWA to open Plant 42 to international maintenance and cargo carriers. LAWA has also obtained a commitment from the Department of Treasury to coordinate for customs and federal inspection services at Palmdale as the need arises.

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Environmental Review

In 1996, a joint administrative Draft Environmental Impact Review/Environmental Impact Statement (Draft EIR/EIS) was prepared by LAWA and the USAF for the proposed expansion of commercial aviation at the Palmdale Regional Airport as envisioned in the 1989 Joint Use Agreement. The administrative Draft EIR/EIS received review by the USAF and was determined to insufficiently address air quality conformity for the proposed increase from 200 to 400 operations a day. The Draft EIR/EIS has not been completed and is on hold by the USAF.

Under previous agreement with the USAF, Palmdale may have up to 50 operations per day. Under the Joint Use Agreement with the USAF, LAWA may make facility improvements with the approval of the USAF, who will require environmental review under NEPA. LAWA will complete a further review when demand necessitates it.

Air Service and Passenger Activity

Palmdale's remote location and limited local passenger market have made it difficult for airlines to maintain air service at the airport despite past subsidies by LAWA. Palmdale's only air service in the past consisted of commuter operations into LAX. About 19,000 passengers used the airport in 1997. Cargo enplaned at the airport in 1997 was less than 1 ton. In early 1998, the sole airline providing service at Palmdale ceased operations. Currently, Palmdale has no scheduled air service.

Results of LAX Master Plan and SCAG RTP Forecast

Both the LAX Master Plan and the SCAG RTP evaluated the future passenger demand potential for Palmdale. The LAX Master Plan determined that approximately 1.3 million domestic O&D passengers are within 60 minutes access time of Palmdale. Most of these air travelers (67 percent), however, are closer to Burbank Airport. Based on the forecasts of regional population and employment, Palmdale's catchment area will be the fastest growing in the region over the next 20 years by percentage. However, it will remain the region's smallest airport catchment area at only 1.5 MAP. Approximately 2.3 million domestic O&D passengers will be within 60 minutes access time of Palmdale in 2015; like today, however, 67 percent of these air travelers will be closer to Burbank Airport. The most likely market for commercial air service at Palmdale would be commuter service to LAX and Ontario. These studies concluded that the potential for Palmdale Regional Airport would be between 200,000 and 700,000 annual passengers in the 2015 to 2020 timeframe.

Palmdale Airport Study

While the SCAG RTP and LAX Master Plan provide similar conclusions regarding the activity potential and need for facility improvements at Palmdale, LAWA commissioned a study in 1998 to determine the maximum theoretical long-term potential of Palmdale Airport, without regard to costs, to improve access or develop airport facilities.⁴ The study, prepared by Hagler Bailly, was completed in October 1999 and concluded that the Palmdale facility was unlikely to be an international gateway or major domestic airport in the 2020 timeframe. The high-end potential demand for Palmdale, including passengers from Kern County, was estimated at 4 MAP in 2010 and 7.3 MAP in 2020. The underlying assumptions of this forecast help explain the higher results compared to the LAX Master Plan and the SCAG RTP. The Palmdale Study noted that:

The projections presented in this report are not, therefore, most likely estimates of potential demand at Palmdale. Instead, they represent the optimum theoretical potential. The actual results will almost certainly be lower, and depending on regional development and investments in the regional transportation system, potentially significantly lower.

Although the study recognized that the passenger potential was highly speculative, it did conclude that the airport could take a role in assisting the regional demand for air cargo service and aircraft fleet maintenance. SR Technics recently announced location of its new North American maintenance facility on a portion of the 17,000-acre airport site owned by the City of Los Angeles. This site has access to the runways at Air Force Plant 42.

⁴ [Palmdale Airport Study](#), Executive Summary, page 1.

To support that role, LAWA, the City of Los Angeles, and the members of a Palmdale Working Group⁵ have aggressively supported the development of high-speed rail to Palmdale as well as various road and highway improvements for access to Palmdale Regional Airport. LAWA has actively supported development of a high-speed rail system that will serve the Antelope Valley in general and Palmdale in particular. LAWA and the Palmdale Working Group are working with California Department of Transportation (Caltrans) to identify key projects in the Route 14/138 corridor that would improve freeway access to the Palmdale Airport. The City of Los Angeles approved the transfer of an easement from LAWA to Caltrans, allowing Caltrans to expand Route 138 on LAWA property.

1.2.3 International Demand

During the past thirty years or more, the U.S. international air traffic has been concentrated at three entry points, or “gateways”, even though smaller amounts of international traffic exist at many other U.S. airports. John F. Kennedy International Airport in New York City dominates the Atlantic air routes, Miami International Airport is the main connecting point for Latin American traffic, and Los Angeles International Airport has been the primary gateway to the Asia-Pacific region. Even today, each of the three primary gateway airports have approximately twice as much international demand as fourth place Chicago-O’Hare. The 1997 listing of U.S. airports with more than 1 million international enplanements⁶ is presented in **Table 1-11**, Identification of the Largest U.S. International Gateway Airports in 1997.

Table 1-11
Identification of the Largest U.S. International Gateway Airports in 1997

Airport	Passengers Enplaned on International Flights	Intl. Enplanements ¹ as % of Airport Total
New York-Kennedy	8,656,000	57.4%
Miami	7,766,000	47.1%
Los Angeles	7,491,000	26.4%
Chicago-O’Hare	3,893,000	12.0%
San Francisco	3,518,000	18.7%
Honolulu	3,138,000	28.7%
Newark	2,823,000	19.1%
Houston-Intercontinental	1,922,000	14.8%
Atlanta	1,739,000	5.3%
Boston	1,698,000	14.1%
Dallas/Ft. Worth	1,680,000	6.1%
Detroit	1,580,000	10.6%
Washington-Dulles	1,430,000	23.4%
Orlando	1,012,000	8.1%

¹ For the 12 months ended December 31, 1997; ranked on 1997 enplanements

Source: DOT, Schedules T-3 and T-100 for international enplanements; ACI-NA, North American Airport Traffic Report for total passengers in 1997.

The development of these three primary gateway airports is due, in part, to their traditional role as the ocean port to their respective regions and the large population with cultural and family associations to the countries served by these gateways. As a result of this historic position, the regions around each of the three primary gateway airports have developed specialized industries including customs processing, warehouses, international packing, storage, and other import-export facilities.

⁵ Members of the group include LAWA, the City of Palmdale, Los Angeles City Councilmember Galanter’s Office, Los Angeles County, Supervisor Antonovich’s Office, the U.S. Air Force, Caltrans, FAA, Metropolitan Transportation Authority, Southern California Association of Governments and the airlines. The purpose of the group is to develop work plans and timetables to move the development of Palmdale Regional Airport forward.

⁶ Enplanements include only passengers boarding a departing flight; whereas, passengers include both enplanements and deplanements. Consequently, passenger levels are approximately double the amount of enplanements.

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An important function of a gateway airport is to serve both local O&D passengers and connecting passengers with good quality air service. Connecting passengers may comprise from 30 to 60 percent of the passengers on international flights. These connecting passengers provide added value to both the airline and the region. The value of these connecting passengers to the airline is that they can increase the load factor of a single international flight with passengers from multiple domestic cities in their network. The value to the region is better international air service than what could be justified based on O&D passengers alone. With 50 percent connecting passengers, an airline can operate twice as many flights than what the local market alone could support. For some international markets, non-stop air service cannot be justified without the addition of connecting passengers from other domestic cities. As the number of international markets served by airlines at the gateway airport increases, opportunities for connecting passengers increases, including opportunities for connections between one international city to another international city. These air service benefits of a gateway airport are similar to that of a major domestic hub airport, but with greater economic value to the region because of the higher value of international air service. The value of a single international flight can be several times greater than the average domestic flight.

LAX's success as a primary U.S. international gateway is due to its ability to provide the infrastructure that allows the airlines to serve the market demand. The three key factors that have been critical to LAX's success as a gateway airport are its local market strength, air service, and airport facilities. These factors are explained in the following paragraphs.

Local Market Strength

The most critical gateway factor is the strength of the local market to attract international air service. The Los Angeles region has a strong international O&D base, particularly to the Asia-Pacific and Latin American regions. In fact, the Los Angeles region has the most O&D passengers to Asia of any U.S. metropolitan region. Over one-third of the passengers and cargo traveling between the United States and Asia pass through LAX. The trade in high-value consumer and electronic goods with Asia provides the Los Angeles region with economic benefits totaling several billion dollars annually. Growth in Latin American markets has created new opportunities for stronger economic ties to Los Angeles in areas such as agriculture, financial services, telecommunications, and entertainment.

Air Service

Air service is not only important to meet the local needs for air transportation but to also attract connecting passengers in order to increase the level of air service, thereby, increasing its benefit to the local residents and businesses. The connecting passengers are also the most competitive element among international gateways. While a direct flight is preferable, for passengers in many cities a connecting flight may be the only option or it may be a better option due to flight frequencies, airline choices, or fare. The competitive strength of a gateway, therefore, depends on the airport's relative level of air service to both international and domestic markets. It is important to consider the balance of domestic air service with international air service. There is little value to the connecting passenger if a particular gateway airport offers 10 flights a day to or from the domestic originating city but only one flight a day to/from the international city. Another important aspect of the international air service is the opportunity for passengers to transit between international flights. For example, LAX functions as a connecting point for travelers between Asia-Pacific and Latin America.

Even though LAX is not a domestic hub airport, it does have a high level of domestic to international connecting passengers. Approximately 55 percent of all international passengers in 1994 were connecting passengers. This high level of international connecting passengers is evidence of the high quality of international air service provided at LAX.

Airport Facilities

A final factor that contributes to an airport's strength as an international gateway is its infrastructure. To serve the type of aircraft that are utilized on intercontinental routes, an airport needs the runway length and other airside facilities capable of handling the largest and longest-range aircraft. All-weather landing capability (and the prevailing weather conditions) is important to ensure access to the airport. Extensive ramp, terminal, and customs facilities are also critical for the peak periods of international activity. While LAX has been able to provide efficient airport facilities, the future ability to provide adequate facilities to meet growing air travel demand will depend on the implementation of the Master Plan.

No other airport in the region, existing or proposed, possesses comparable market accessibility, airport facilities, and domestic air service to support extensive high frequency overseas international air service in the foreseeable future (2015 to 2020). The continued concentration of international air service in the Los Angeles region at LAX is most likely for several reasons. LAX has the facilities in place necessary to support international travel that would be difficult and costly to duplicate elsewhere—runways, terminals, warehouses, and U.S. Customs facilities, which are particularly difficult to relocate due to minimum staffing requirements. Also at LAX there is a vast network of off-airport warehouses, customs brokers, freight forwarders, and other businesses that form an intricate network supporting a complex international trade center. Bilateral agreements between the U.S. and many foreign governments specifically designate LAX as the U.S. port of entry. Other airports in the region cannot provide these same qualities necessary to attract additional international air service. Neither Ontario Airport nor a new El Toro Airport would have the local international O&D demand or domestic air service to support significant overseas international activity until well after 2015. Accordingly, while secondary airports may establish some limited international service to niche markets in Canada or Mexico, LAX will be the only airport during the planning period able to serve the bulk of the Los Angeles region's international travel needs.

LAX also provides the best opportunity for the region to leverage its local base of international passengers to attract greater international air service by airlines providing opportunities for connecting passengers. This leverage benefit will result in increased flights to major international cities and new flights to smaller international markets that currently do not have direct service from Los Angeles.

Although LAX's role as an international gateway cannot readily be duplicated by other airports within the region, there is a chance that future growth in international service – and the jobs and investment stimulated by this activity – could be lost to airports outside the region, perhaps outside the state. Unlike O&D demand, demand for connecting service can be met at airports within a wide geographic area. International connecting passengers are especially susceptible to competition from out-of-region airports, such as San Francisco, Phoenix, Las Vegas, and Denver. All of these airports have made or are making substantial investments in new capacity at their principal commercial service airports. The competition from other potential gateways is supported by other significant trends:

- ◆ New opportunities for bilateral agreements and additional gateways in the continually deregulating international market have opened under "Open Skies" initiatives. If the "Open Skies" initiative continues, market forces will be an even stronger determinant of the future competitive environment.
- ◆ Advances in aircraft technology have permitted non-stop overseas flights to inland cities. Many of these inland cities (such as Denver, Chicago, Phoenix, and Dallas) have developed sufficient demand for international air service.
- ◆ Capacity limitations at primary gateways have made it less attractive and more costly to use these facilities.
- ◆ Major domestic hubs have vast domestic air service networks to use as a competitive edge in providing cost effective and efficient connecting service.

Competition among airlines for U.S. gateways will only intensify as the domestic markets become more mature and international markets continue to expand. The most critical factor in the competition for gateway connecting passengers will remain the strength of the local market for international air service--that is, the O&D demand between gateway cities and international markets - with the secondary factor being the potential for international connecting activity.

1.2.4 Forecast Distribution of Demand

Both the LAX Master Plan and the SCAG 1998 RTP prepared forecasts of passenger demand among the regional airports. Both studies used RADAM to assess the effect of market accessibility, air service, and other market-based variables on the allocation of passenger demand. The SCAG forecast included three separate scenarios of low, medium, and high projections as shown below on **Table 1-12**, 1998 SCAG Regional Transportation Plan 2020 Air Passenger Activity Forecasts in Million Annual Passengers (MAP).

Both the SCAG and the Master Plan forecasts increased demand for air service at LAX, despite anticipated growth at other airports. The LAX share of the region's total demand is projected to decline, but the number of passengers using LAX will continue to increase throughout the next 20 years.

Additional forecast modeling was conducted by SCAG and is detailed in Chapter I, Appendix I-A.1 of the Master Plan. These additional SCAG scenarios differ from the market-based analysis of the RTP in that

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they consider theoretical constraints that were developed on LAX and other airports. Under these SCAG scenarios, passenger activity ranging from 6.8 MAP to 26.9 MAP would be lost to the region if LAX were constrained.

Table 1-12

1998 SCAG Regional Transportation Plan 2020 Air Passenger Activity Forecasts in Million Annual Passengers (MAP)

Airport	1995	SCAG RTP Scenarios		
	Actual	2020 Low	2020 Medium	2020 High
Burbank	4.9	8.4	9.2	9.7
John Wayne	7.2	6.4	7	7.3
Long Beach	0.4	2.6	2.8	3.6
Los Angeles	53.9	90.7	94.2	101
Ontario	6.4	13.9	15.3	17.2
Oxnard	0.1	0.1	0.2	0.1
Palmdale	0	0.1	0.1	0.2
So Cal Logistics	0	0.1	0.1	0.1
March	0	0.7	0.9	1.3
Palm Springs	1	1.7	1.7	1.8
El Toro (proposed)	0	20.1	22.2	23.6
San Bernardino	0	1.6	1.8	1.9
Point Mugu (potential)	0	1.6	1.8	2
Totals	73.9	148.0	157.3	170.0

Source: SCAG, 1998 Regional Transportation Plan, Table 21

The questions regarding the amount of growth at other airports in the region also prompted additional modeling for the LAX Master Plan. To test the effects of various alternatives for Burbank and the Orange County airports, at which future facility development is uncertain, the Master Plan nonetheless considered these three airport system scenarios:

- ◆ **Scenario 1** assumes that El Toro is fully developed and John Wayne is closed. Additional terminal capacity is assumed to be developed at Burbank. Consequently, Ontario and Long Beach airports, although not constrained by facility limitations, do not achieve higher passenger demand because of the additional air service at El Toro.
- ◆ **Scenario 2** assumes that El Toro is not built and John Wayne is constrained to its physical capacity. Ontario's facilities are assumed to be unconstrained. As a result of Orange County's limited capacity, Ontario and Long Beach achieve a high air service potential. Burbank is also assumed to be constrained in this scenario, creating an opportunity for additional air service development at Palmdale. Oxnard realizes additional air service as a result of the Burbank limitation.
- ◆ **Scenario 3** assumes that El Toro is built and Burbank's capacity is expanded. All other airports are assumed to be unconstrained, but the additional air service at El Toro keeps Ontario and Long Beach at more moderate air service levels. Likewise, additional air service at Burbank limits Palmdale's air service development potential.

LAX's domestic O&D market share in these three scenarios ranges between 48 to 58 percent. These new scenarios created a greater range of potential passenger activity at Ontario Airport, ranging from a 13 to 19 percent share. The activity forecasts from these scenarios, summarized in **Table 1-13**, Los Angeles Region Airport System Scenarios 2015 Passenger Activity Forecasts, reflects an assessment of how passengers and airlines would choose an airport based on market accessibility.

Table 1-13

Los Angeles Region Airport System Scenarios 2015 Passenger Activity Forecasts

Airport	LAX Master Plan	Additional LAX Master Plan Scenarios		
	Forecast	Scenario 1	Scenario 2	Scenario 3
Los Angeles	97,960,000	97,500,000	105,700,000	96,500,000
Ontario	48,510,000	13,862,500	20,750,000	13,875,000
John Wayne		N/A	11,625,000	7,862,500
El Toro		28,750,000	N/A	21,625,000
Burbank		6,777,778	6,333,333	7,666,667
Long Beach		1,000,000	1,300,000	860,000
Palm Springs		1,080,000	900,000	1,100,000
Oxnard/Point Mugu		344,000	355,000	300,000
Palmdale		305,000	700,000	230,000
Region Total	146,470,000	149,619,278	147,663,333	150,019,167

Source: Prepared by Landrum & Brown, 2000

The precise numbers vary among the different forecasts and scenarios; but the consistent conclusion of this analysis is that demand for air service at LAX will increase regardless of the service available at the region’s secondary airports, and that increased capacity at LAX will be needed to avoid lost regional economic opportunity. Although excess capacity exists at some of the region’s existing or proposed commercial service airports, the limited ability of airport operators and even airlines to allocate demand on this basis means that certain airports will become increasingly congested. Ultimately, lack of capacity at the airports with highest demand will lead to a loss of connecting passengers to airports outside the region. This pattern will be most evident – and the economic impact most strongly felt – in international service. An increasing share of future demand can be accommodated by the region’s secondary airports, but these airports are not well positioned to capture a significant share of the international market. Because LAX is the only airport in the region that can effectively compete with other international gateways, maintaining international service at LAX is a critical component in any regional air transportation plan.

1.3 Meeting the Demand for Transportation in the Region

Over the next 15 years, several key trends are likely to affect the transportation system in the Los Angeles region. Such trends include changes in the region’s demographics and economic conditions that will likely increase the demand for transportation of both passengers and cargo. In addition to aviation demand, the 1998 SCAG RTP states that truck, rail, and maritime demand will increase dramatically along with population and job growth. For example:

- ◆ Truck traffic is forecast to grow 2 to 3 percent per year and constitute over 40,000 trips per day on certain corridors by 2020 completely overwhelming some freeways. There is almost no capacity to deal with this increase.
- ◆ The proportion of the regional freeway system, considered extremely congested, will rise from 3 percent in 1994 to 25 percent in 2020.
- ◆ Ocean-going cargo is expected to increase greatly from the 120 million tons moved in 1995, as international cargo is expected to double.
- ◆ Rail traffic, which carried 91 million tons of cargo into and out of the region in 1995, is also expected to increase with the completion of two new rail lines—the Alameda Corridor connecting the ports of Los Angeles and Long Beach with downtown Los Angeles - and the Alameda Corridor East connecting East Los Angeles to San Bernardino.

The RTP makes particular note of the need for maritime and aviation capacity in light of the projected doubling of international trade. The RTP also notes that aviation and maritime facilities are self-funding through fees and that other modes are severely underfunded.

1. Regional Context

Non-aviation modes of transportation serve distinct markets and may also satisfy a portion of the demand for air travel. However, while other travel modes may offer competitive service in terms of cost and convenience, they do not offer the speed of air travel and therefore are unable to fully satisfy the projected demand for the region. Similarly, although the use of teleconferencing, video-conferencing, and various forms of electronic communications have replaced some business travel, this technology has also made it easier to conduct business on a national and international scale which, in turn, has generated additional demand for air transportation.

At LAX, four of the top five O&D markets are cities within 400 miles (Oakland, Las Vegas, San Francisco, and Phoenix), as shown in **Table 1-14**, Major Los Angeles Region Domestic and International Passenger Markets. These markets represent approximately 27 percent of the region's total domestic O&D demand, which suggests that at least some of this demand could be met by rail or highway. The LAX Master Plan (Chapter III, *Forecasts of Aviation Demand*) considered these other modes of transportation and communication in the formulating of the forecasts for air transport at LAX and concluded that despite the importance and growth of other modes, a large and growing demand for air travel remains.

Table 1-14

Major Los Angeles Region Domestic and International Passenger Markets

	City	Domestic O&D Passenger ¹	% Domestic O&D	Driving Miles	Air Miles	Driving Hours	Air Hours
1	Oakland	3,966,180	8.4%	370	344	8	1
2	Las Vegas	3,228,810	6.8%	270	227	5	1
3	San Francisco	3,013,130	6.4%	381	344	8	1
4	New York/Newark	2,978,940	6.3%	2,770	2,465	55	5
5	Phoenix	2,646,230	5.6%	372	356	8	1
6	San Jose	2,459,730	5.2%	340	320	7	1
7	Sacramento	2,178,340	4.6%	384	377	8	1
8	Seattle/Tacoma	1,902,480	4.0%	1,120	957	21	2
9	Chicago	1,680,530	3.6%	2,017	1,738	40	4
10	Honolulu	1,392,490	2.9%	N/A	2,556	N/A	5
11	Portland	1,160,280	2.5%	963	837	20	2
12	Salt Lake City	1,137,890	2.4%	685	585	13	1
13	Denver	1,002,180	2.1%	1,016	848	20	2
14	Washington, DC	988,490	2.1%	2,648	2,291	55	5
15	Dallas/Fort Worth	886,470	1.9%	1,437	1,221	28	3
16	Boston	801,420	1.7%	2,988	2,606	60	5
17	Reno	684,360	1.4%	518	393	10	1
18	Atlanta	637,330	1.3%	2,218	1,936	44	4
19	Houston	626,320	1.3%	1,551	1,372	31	3
20	Tucson	565,560	1.2%	488	445	10	1
21	Miami	563,030	1.2%	2,771	2,339	56	5
22	Albuquerque	524,860	1.1%	787	667	15	2
23	Philadelphia	498,520	1.1%	2,712	2,395	55	5
24	Minn./St. Paul	471,770	1.0%	1,928	1,527	40	3
25	Detroit	461,780	1.0%	2,284	1,971	45	4
Subtotal of Top 25 Markets		36,457,120	77.1%				
All Other Domestic Markets		10,845,350	22.9%				
Total All Domestic Markets		47,302,470	100.0%				
			%				
International Markets ²		International Passengers	International Passengers				
	Asia/Pacific	1,678,342	33.1%				
	Central America/Mexico	1,511,749	29.8%				
	Europe	1,209,734	23.8%				
	Oceania	549,940	10.8%				
	South America	120,865	2.4%				
	Africa	4,154	0.8%				
Total International Markets		5,076,781	100.0%				

¹ DOT 10% sample ticket survey, calendar year 1995 (Latest available information at the time of the analysis.)

² LAX Master Plan Chapter III, *Forecasts of Aviation Demand*

Source: Landrum & Brown, 2000

1.3.1 Highway Travel

Inter-city travel by automobile or bus is a readily available and commonly used alternative to air travel, especially for trips that are less time sensitive; and cargo transport by truck is an important element of the regional economy. For trips over 500 miles, highway travel becomes less practical because of the lengthy travel time and increased costs for lodging and other expenses. In spite of the cost advantages of highway travel for destinations within 500 miles, passengers and shippers may opt for air transportation when time is an important consideration, as demonstrated by the strength of the air service market for destinations such as Oakland, San Francisco, and Las Vegas. Overnight package service and one-day business trips to these destinations are a growing phenomena made possible by air transportation.

Inter-city bus transportation is also available, but not much used by regional travelers. Greyhound provides service from its downtown Los Angeles terminal to approximately 1,600 destinations in 48 states. Between September 1998 and August 1999, there were approximately 48,000 bus departures. Greyhound declined to release precise passenger figures; however, assuming very high load factors this number of departures would yield at most 2,000,000 passengers per year. There are 44 buses that depart during the week for San Diego. Eleven buses depart daily for Santa Barbara, five for Seattle, six for Chicago (with an additional two leaving on Friday, and one additional bus on Saturday), and six for Orlando. While bus fares are competitive with airfares, travel times are significantly longer. A one-way fare from Los Angeles to Seattle is \$81; the travel time is 27 hours. The one-way fare from Los Angeles to Orlando is \$128 and the trip takes three days.

There are no new developments in highway travel that would make it more competitive with air transportation in terms of travel time. As highways become more congested, travel time and costs relative to air transportation increases. Highway travel is not a feasible means of serving the international market, and there are no indications that inter-city bus travel will expand from its present volume to supplant the demand for domestic air travel. For these reasons, increased use of automobiles, buses, or trucks is not a reasonable alternative for meeting regional air transportation demand.

1.3.2 Rail Technology

Inter-city railroad service is readily available but underutilized by passengers. Amtrak provides service on four lines from downtown Los Angeles to other U.S. cities. A total of 1,050,143 passengers (arrivals and departures) used inter-city rail to and from Los Angeles during the year between September 1998 and August 1999. Eight trains per day connect to San Diego, one train leaves for Seattle, and another leaves for Chicago. Three days per week a train leaves for Orlando. Like bus fares, rail fares may be competitive with airfares but travel times are significantly longer. A one-way fare to Seattle ranges in cost between \$98 to \$163, and travel time is 35 hours; the one-way fare to Orlando ranges between \$150 to \$279 for the three-day trip.

To compete with air travel, rail transportation must provide a comparable level of convenience and cost. Current conventional rail does not provide competitive travel time. Potential future high-speed rail may provide competitive travel times for some door-to-door trips.

Among the top ten domestic markets served by airlines at LAX, the most likely markets for competitive rail transportation are Sacramento, San Francisco, Oakland, San Jose, and Las Vegas. As indicated in **Table 1-14**, these markets represent over 31 percent (nearly 15 million annual passengers for those five cities) of the domestic O&D air passenger activity in the Los Angeles region.

One proposed high-speed rail project involves SCAG vying with six other states for a \$950 million federal grant to construct a high-speed rail demonstration project that would connect LAX to downtown Los Angeles, the San Gabriel Valley, Ontario International Airport, and March Air Reserve Base/March Inland Port. The application for this competition was submitted in June 2000, and a preliminary selection is scheduled for this fall and final selection next year. A preliminary analysis by the Federal Railway Administration indicates the travel benefits of the SCAG proposal outweigh those of all other proposals combined. Should SCAG be awarded this grant, construction could begin within five years.

In addition, a larger project is being proposed by the California High-Speed Rail Authority (CH-SRA) which is mandated by state legislation to develop plans for a statewide high-speed rail system. Their publicly released Draft Business Plan, dated January 2000, sets forth a recommended route to be studied in the environmental clearance process and sets forth a proposed development schedule. The route to be studied would connect several cities in the Bay Area, San Francisco International Airport, Sacramento,

1. Regional Context

Bakersfield, Palmdale, Burbank, downtown Los Angeles, LAX, Riverside, Anaheim, San Diego, and several cities in between.

The development schedule for the CH-SRA system is 16 years. The process begins with a three year "EIR/federal-level Tier 1 environmental impact statement" followed by three additional years of site-specific environmental assessments. Environmental work and preliminary engineering is expected to cost \$370 million. The state budget for 2000 included \$5 million to begin the environmental work. Construction of the entire 700-mile system is expected to require a total of 10 years following environmental clearance and to cost approximately \$26.6 billion. The first segments completed are expected to be intra-regional, and links between San Francisco, Los Angeles, and San Diego are not expected to be completed until later in the construction period.

Travel times, fares, and passengers for the high-speed rail are also forecast in the Draft Business Plan. Typical express travel times are expected to be one hour between the downtowns of Los Angeles and San Diego and two and one-half hours between the downtowns of Los Angeles and San Francisco. Total travel costs (not just fares) for high-speed rail express service between Los Angeles and either San Francisco or San Diego are expected to be about 40 percent of the cost of air travel. (Air travel cost in the Draft Business Plan includes, in addition to fares, travel time to and from the airport and other costs.) Ridership in 2020 is expected to be 11.2 MAP between Los Angeles and San Francisco and 5.3 MAP between Los Angeles and San Diego. Total ridership is forecast at 32 MAP in 2020.

As indicated on **Table 1-14**, a total of 11.6 MAP travel between the Los Angeles region and the cities proposed to be served by the CH-SRA system - Oakland, San Francisco, San Jose, and Sacramento.

A potential high-speed rail system would compete with the airlines providing service at each of the Los Angeles region airports. Reallocation of this demand among the region's airports and a future potential high-speed rail system would depend on the relative convenience of the inter-city travel options and the passengers' sensitivity to those convenience factors. The two primary convenience factors are travel time and cost. The passenger would weigh each option's relative total travel time and cost in making a choice of travel modes. The passenger would also consider the perceived risk of delays with each of the options. If the proposed CH-SRA system is developed as outlined in the business plan, it is likely that some air trips would be reallocated to high-speed rail trips.

In the Los Angeles region, it is uncertain how much demand would be reallocated from air trips to high-speed rail trips and which airports would have reduced air trips as a result of the new service. It is most likely that airports with the least convenient travel options - due to lower service, higher travel times, or higher cost - could see a reduction in demand. Given the high level of air service from LAX to these high-speed rail markets, LAX would likely see the lowest passenger diversion to high-speed rail. Also, LAX's growing markets are in the international markets, which high-speed rail will provide a supporting role to LAX by providing more connecting opportunities for some passengers. However, even for the airports that currently have less air service to these markets, the reallocation would depend on the airlines' response to this competitive service mode.

In any case, it is highly speculative to forecast the number of air trips reallocated to high-speed rail trips at this time. The CH-SRA system, if implemented, will not be available until at least 2017. If and when it does come on-line, there are many uncertainties that will determine its potential impact on the Los Angeles region airports in general and LAX in particular. Based on the information currently available, it is clear that increased use of rail, which may occur as a result of a potential future high-speed rail system, is not a reasonable alternative to meeting regional air travel demand.

1.3.3 Ocean Surface Vessels

International shipping by ocean surface vessels accounts for large volumes of cargo that is not time sensitive. The Port of Los Angeles served 3.2 million 20-foot equivalent units of cargo during 1998. The cargo value was \$73.8 billion and the top five imports were crude petroleum, petroleum oils, iron and steel shapes, and ethers. The top five exports were coal, petroleum coke, petroleum oils, iron and steep scrap, and waste paper. The Port of Los Angeles' top trading partners were Japan, China, Taiwan, South Korea, and Ecuador. There were 2,569 vessel arrivals in 1998. The Port of Los Angeles is also the busiest cruise terminal on the West Coast, serving nearly 1 million passengers annually. Most cruises are bound for Mexico; however, Los Angeles also serves as a stop for cruise ships sailing to Alaska and other world destinations.

Located directly adjacent to the Port of Los Angeles, the Port of Long Beach is the busiest cargo container port in the U.S. In 1998, it generated \$80.4 billion in trade; and, more than 4.1 million 20-foot cargo container units moved through the Port. East Asian trade accounts for more than 90 percent of its shipments. The top trading partners are China, Hong Kong, Japan, Korea, and Taiwan. In 1998, the cargo tonnage through the Port of Long Beach totaled 60.8 million metric tons, with a value exceeding \$80 billion. The leading import commodities by volume were bulk petroleum, electronics, electrical machinery, plastics products, clothing, furniture, machinery, and parts. The leading export commodities by volume were petroleum coke, bulk petroleum, chemicals, waste paper, foods (meats, fruits, nuts), machinery, and feeds.

Despite planned expansion of seaports, ocean surface travel lacks the economy, convenience, and speed associated with air travel. Passenger travel via ocean surface is primarily devoted to recreational travel. Furthermore, the capacity of cruise ships to carry passengers is limited. Currently there are only 31 certified vessels, all but one of which have less than 100 berths. Federal law prohibits non-U.S. registered ships from carrying passengers to and from U.S. ports. The Federal Maritime Commission issues certifications only to vessels built in the U.S. The small number of shipyards in the U.S. limits expansion of the fleet. Although one certified ship has 1,021 passenger berths and three other ships with capacity over 1,000 berths are under construction, passenger capacity remains limited.

Even with increased capacity, passenger ships are likely to continue to be used for recreational purposes by a limited segment of the population, and are not expected to regain their former status as the dominant means of transoceanic travel. Cargo transport via ocean surface remains suitable primarily for bulky and heavy items that are not time sensitive. For these reasons, increased use of ocean surface travel is not a reasonable alternative to meeting regional air travel demand.

1.3.4 Telecommunications and Video-Conferencing

The impact of new communications technologies has been considered in the formulation of air transport demand forecasts. Two-way video technology has been available for nearly 30 years, with limited impact on the transportation industry, although recent improvements in the affordability, quality, and speed of transmission have made video-conferencing a more accepted alternative to face-to-face meetings. Considerable progress has been made in the last decade in improving the reliability and speed of voice and data communication. High-speed communication services are now provided over existing telephone lines, and the widespread installation of fiber optics and state-of-the-art electronic signal technology is expected to result in notable technological improvements in the next decades.

Two primary studies have been conducted to assess the impact of communication technology on air travel demand: the *Strategic Assessment Report* for the Massachusetts Aeronautics Commission and *Making Connections: How Telecommunications Technologies Will Affect Business and Leisure Air Travel*, by Apogee Research. The *Strategic Assessment Report* indicated that by 2010, a reduction in air travel demand of 7 percent at Boston Logan International Airport could result as video-conferencing is used as a substitute for face-to-face meetings; by 2030, video conferencing could reduce demand for air travel at Logan by 15 percent.

Two key findings of the Apogee study that may be applicable to LAX include:

- ◆ For non-discretionary travel (typically a business traveler), video-conferencing has the potential to satisfy between 5 to 30 percent of air travel demand in 2030.
- ◆ For discretionary travel (pleasure/personal) technology is believed to be very limited (less than 5 percent).

Given that 50 percent of LAX users are leisure travelers, it is projected that less than 5 percent of air travel demand at LAX could be satisfied by communication technologies in 2015. These amounts were factored into the assumptions of the LAX Master Plan forecasts.

1.4 The Need to Improve LAX

International trade and travel combined with a rapidly growing demand for air cargo make convenient air transportation an essential ingredient of the region's economic activity. The economy of the Los Angeles region is bolstered by the creation of about 408,000 jobs and approximately \$60 billion in annual economic activity by the region's airports. In particular, the health of the economy in the Los Angeles region depends in large part on the continuing role of LAX as an international gateway.

1. Regional Context

As described above, LAX's international service and accompanying domestic connecting flights could not be dispersed to other airports within the region. Constraints on LAX's ability to serve the international market likely would result in a loss of international air traffic to other regions and a corresponding economic loss to the Los Angeles region and the State of California. This conclusion, supported by examples from around the world, is described in Chapter I of the Master Plan, *Air Transportation in the Los Angeles Region*.

A state-of-the-art sensitivity analysis conducted in 1998 by SCAG also reached this conclusion. The SCAG study, fully explained in Chapter I of the Master Plan establishes that if LAX were constrained in an effort to redirect the market to other airports, the international air traffic would be lost to the region, and would move to other airports with the requisite air service route structure such as San Francisco, Denver, or Dallas. The study demonstrates that attempting to accommodate future growth in regional demand by artificially dispersing it to the region's secondary airports would not meet the goals of SCAG or the City of Los Angeles and LAWA to maximize the international economic prominence of the region.

Forecasts of aviation demand developed for the Master Plan as well as those conducted by SCAG underscore the need to accommodate some portion of the increased regional demand for air transportation at LAX. Despite projections for growth at other airports and LAX's reduced proportion of regional air transportation, LAX is projected to serve a larger volume of passengers and cargo over the next 15 to 20 years. Currently, LAX has the capacity, with certain fleet mix changes and other operational adjustments, to serve approximately 78.7 MAP and 3,120,00 annual cargo tons. The Master Plan forecasts indicate that there is a need for LAX to serve 97.9 MAP and 4,172,000 annual cargo tons.

As described in Chapters 2, *Purpose and Need for the Proposed Action*, and 3, *Alternatives*, the existing facilities at LAX cannot accommodate the existing demand and forecasted increase in the numbers of aircraft, cargo and passengers without significant delays and a very poor level of service. As the existing facilities are used beyond their design capacity, the level of service provided to the user degrades. This lowering of the level of service will be demonstrated by increased congestion within the passenger terminals, the various surface roads on and around the airport, and on the airfield itself. The consequences of taking no action to solve this problem will result in a loss of air service and declining economic benefits (jobs) for the Los Angeles region. Air service and economic benefits would likely relocate to other regions both within the state of California and to other states. Therefore, any comprehensive solution to meeting the regional demand for transportation over the next two decades must include increased capacity at LAX.