Technical Report
LAX Master Plan Supplement to the Draft EIS/EIR

S-3. Supplemental Economic Impacts Technical Report

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Prepared for:

Los Angeles World Airports

U.S. Department of Transportation
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1. EXECUTIVE SUMMARY

Regional airports play an essential role in supporting the growth of a metropolitan economy like that of the five-county Southern California region.[1] They directly employ thousands of workers and produce millions of dollars per year in taxes and other revenues for the host jurisdiction. More generally, they support the growth of the regional economy by facilitating the efficient movement of people, goods and services that originate in, or are transported through, the region in response to its amenities and market opportunities. Airports and related aviation facilities create competitive advantages for a region that become structurally integrated into its economy by enabling industries that either depend on, or learn to take advantage of, efficient air transportation to access domestic and international markets. Los Angeles International Airport (LAX), which is managed for the City of Los Angeles by Los Angeles World Airports (LAWA), plays this growth-facilitating role in Southern California.

The scale of current and future economic activity associated with a regionally significant airport like LAX -- expressed in numbers of jobs and dollars of economic output -- can be measured by tracing the relationships between sectors of the economy that depend on air transportation and the number of air passenger enplanements and deplanements and tons of air cargo loaded and unloaded at the airport. **Figure S1,** Economic Impact Accounting Framework for LAX Master Plan Alternatives, illustrates the analytic framework that has been used to estimate the direct economic impacts of air passenger and air cargo activity at LAX in the Southern California regional economy for each of five LAX Master Plan alternatives. The No Action/No Project Alternative and three build alternatives that involve constructing new airport facilities were analyzed in the Draft Environmental Impact Statement/Environmental Impact Report (Draft EIS/EIR) published in January 2001. This report for the Supplement to the Draft EIS/EIR presents analysis of a new "build" alternative, Alternative D - Enhanced Safety and Security Plan.

The relationships between regional airports and their host economies change over time in response to changes in the structure of the economy, the nature of the industries in it and the costs of doing business. In order to account for the dynamic character of these relationships over the planning horizon of the LAX Master Plan, the economic impacts of Alternative D, like the original four alternatives analyzed in the Draft EIS/EIR, were estimated, in part, using an econometric forecasting model of the Southern California region developed by Regional Econometric Models, Inc. (REMI). This approach differs from the one-time "snapshot" approach of LAX's impact on the regional economy that has been prepared in the past, and from similar analyses that have been performed for other airports around the nation. It has been designed specifically to account for the complexities of the economic interactions between LAX and the regional economy over time, the network economics characteristics of regional airports, and explicitly accounts for productivity changes over time.

As with the Draft EIS/EIR analysis, use of the REMI model to evaluate Alternative D was supplemented with a wide range of data to establish the statistical relationships between changes in the regional economy and the principal variables that define alternative LAX Master Plan concepts - volume of air transportation services, passenger volumes, by type of passenger, and cargo tonnage, by type of cargo. These data were assembled from historical records, surveys of passengers and interviews with a wide range of businesses in the region, which depend on air transportation services. Special efforts were made to also understand the geographic distribution of the economic impacts of LAX Master Plan alternatives within the five-county region, particularly within the City and County of Los Angeles.

Based on the economic impact accounting framework described in the Draft EIS/EIR, it is estimated that LAX was directly related to over $60 billion[2] in total economic output and about 408,000 jobs in the regional economy in 1996, the base year for the analysis reported here and in the Draft EIS/EIR[3]. Total direct LAX-related employment represents about one out of every 20 jobs in the regional economy. The total includes about 59,000 (14%) jobs at, or in the area immediately surrounding, LAX. The balance of jobs is in a wide range of passenger spending-related industries and air cargo-related manufacturing industries in other locations within the region. When the multiplier effect of these direct impacts is taken

[1] For purposes of this analysis, the five-county Southern California region includes the counties of Los Angeles, Orange, Riverside, San Bernardino, and Ventura.

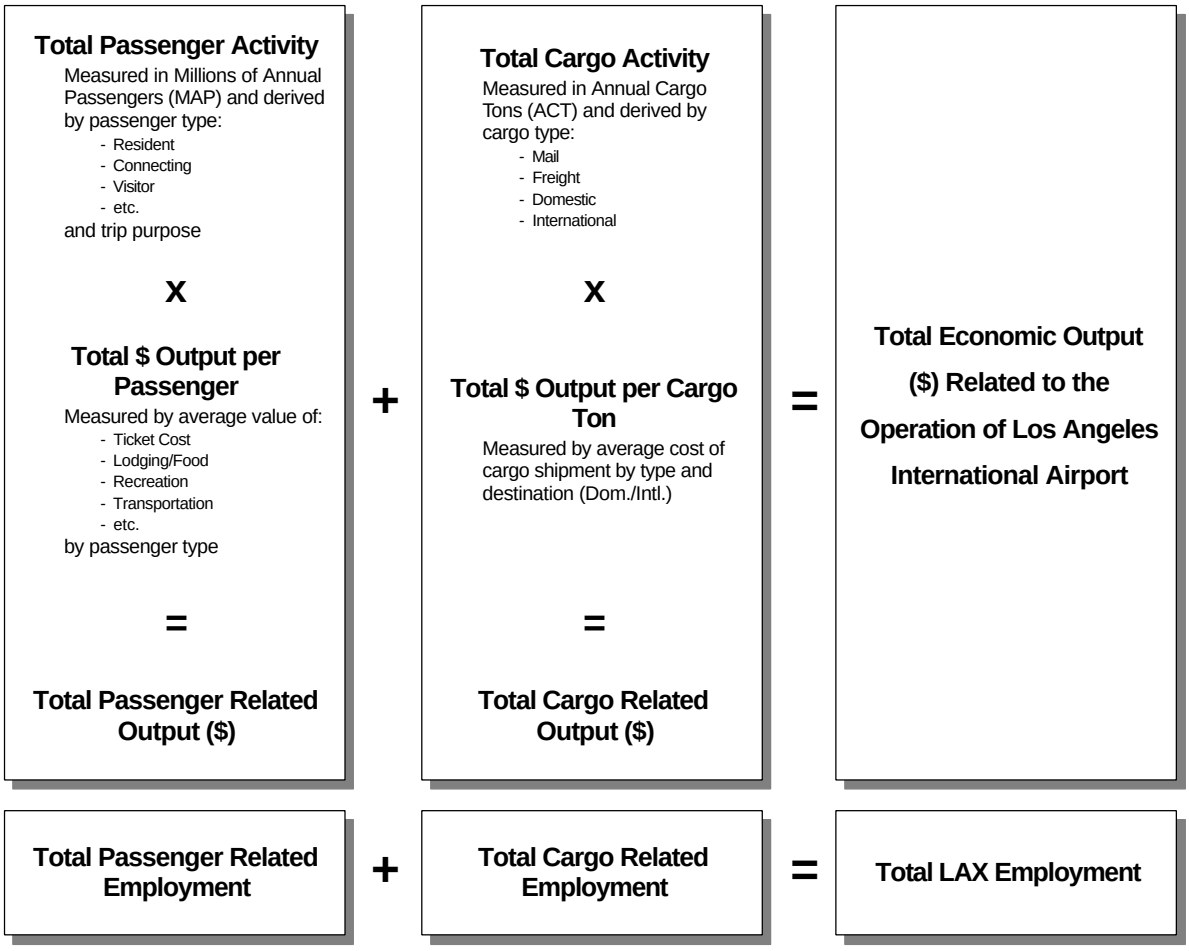
[2] All dollar amounts are expressed in constant 1996 dollars, unless noted otherwise.

[3] By 2000, when LAX handled 67.3 million annual passengers and 2.3 million annual tons of air cargo, activity at LAX accounted for $65 billion in total direct economic output in the region and approximately 425,000 jobs.

into account, LAX's impact in the region swells to $110 billion and 932,000 jobs. Most of this impact occurs in the City and County of Los Angeles, and more particularly, within a 20-mile radius around LAX. About 48,700 (12%) of these jobs are in the air transportation and airport government sectors. An additional 109,500 (27%) jobs are in various passenger spending sectors. The remaining 249,500 (61%) jobs are in the manufacturing sectors, which rely heavily on LAX in order to move manufactured goods into and out of the regional economy.

Figure S1

Economic Impacts Accounting Framework for the LAX Master Plan Alternatives



If LAX could expand operations to fully accommodate the projected future growth of the regional economy by the year 2015, it would be associated with about 448,000 jobs throughout the region, a 10 percent increase. But, full accommodation of this demand is not being contemplated. Instead, LAWA is analyzing four "build" alternatives for the future of LAX, two of which would not meet projected future demand, including a new Alternative D that is the subject of this report, as well as a No Action/No Project Alternative. The economic impacts of the No Action/No Project Alternative and Alternatives A, B, and C were analyzed in the Draft EIS/EIR.

The physical characteristics of Alternative D are described in Section 5.1, *Description of Alternative D*, below. Construction of these improvements would enable LAX to accommodate 71.2 million annual passengers (MAP) by 2005. By 2015, completion of the Alternative D improvements would enable LAX to accommodate 78.9 MAP, or slightly more passengers than the No Action/No Project Alternative (78.7 MAP), but considerably less than any of the other build alternatives (89.6-97.9 MAP). These improvements would also enable LAX to handle 3.1 million tons of cargo annually in 2005, with no further increase by 2015. This is the air cargo volume assumed for the No Action/No Project Alternative, and about one million tons less in 2015 than any of the other build alternatives. **Table S1**, Aviation Activity Characteristics of the LAX Master Plan Alternatives, compares the passenger and air cargo volumes assumed for Alternative D with those for the No Action/No Project and three other build alternatives that were analyzed in the Draft EIS/EIR.

Table S1

Aviation Activity Characteristics of the LAX Master Plan Alternatives

	NA/NP		Alt. A		Alt. B		Alt. C		Alt. D	
	2005	2015	2005	2015	2005	2015	2005	2015	2005	2015
MAP[1]	71.2	78.7	71.2	97.9	71.2	97.9	71.2	89.6	71.2	78.9
MAT[2]	3.1	3.1	3.1	4.2	3.1	4.2	3.1	4.2	3.1	3.1

[1] MAP = millions of annual passengers
[2] MAT = millions of annual air cargo tons

Source: Landrum & Brown. 2002

When the aviation activity levels assumed for Alternative D are analyzed using the economic impact accounting framework described above, it is estimated that Alternative D would produce slightly more economic output ($63.7 billion) and jobs (350,557) in 2015 than the No Action/No Project Alternative, but less than the jobs and output associated with the other build alternatives analyzed in the Draft EIS/EIR. These relationships are shown in **Table S2,** Total Direct Economic Output and Employment Impacts of the LAX Master Plan, by Alternative, 1996, 2005, and 2015.

Table S2

Total Direct Economic Output and Employment Impacts of the LAX Master Plan, by Alternative, 1996, 2005 and 2015 (dollar amounts in millions)

	Base Year	NA/NP		Alt. A		Alt. B		Alt. C		Alt. D	
Impacts	**1996**	**2005**	**2015**	**2005**	**2015**	**2005**	**2015**	**2005**	**2015**	**2005**	**2015**
Construction Impacts in Los Angeles County											
Total Economic Output[1]	NA	NA	NA	NA	$21,836	NA	$24,523	NA	$19,414	NA	$11,326
Employment	NA	NA	NA	NA	211,507	NA	237,234	NA	187,621	NA	102,244
Annual Operations Impacts in Southern California											
Direct Economic Output[2]	$60,439	$73,210	$63,697	$73,210	$83,726	$73,210	$83,726	$73,210	$82,175	$73,210	$63,729
Employment	407,670	424,968	350,110	424,968	448,083	424,968	448,083	424,968	425,369	424,968	350,557

[1] in 1997 $
[2] in 1996 $

Source: Hamilton, Rabinovitz & Alschuler, Inc., 2000, 2003.

As with the alternatives analyzed in the Draft EIS/EIR, the economic output and total number of direct jobs in 2015 and the incremental jobs over the 1996-2015 project implementation period for Alternative D were distributed within the five-county region by census tract. HR&A's employment distribution model assumes that jobs in each of the industry sectors affected by the LAX Master Plan will be distributed geographically in the same proportions that all jobs in those industry sectors were distributed in 1990, according to the U.S. Census.

The distributional patterns of employment resulting from Alternative D are similar to those for the other four alternatives analyzed in the Draft EIS/EIR. About three-quarters (78%) of the total and incremental Alternative D direct jobs would be located within 20 miles of LAX. The largest concentration of jobs would be within the City of Los Angeles, but other concentrations would occur in the cities immediately adjacent to or near LAX (e.g., Torrance) and a few cities further afield (e.g., Burbank, Long Beach and Anaheim), where there are concentrations of industries that depend on efficient international air transportation services. When the results of the estimates are sorted by City of Los Angeles Community Plan Area (CPA), the Western area, including the Westchester CPA around LAX, would capture almost half (47%) of total Alternative D jobs in 2015.

The analysis in this report demonstrates that Alternative D (i.e., incremental passenger growth to 78.9 MAP and 3.1 MAT by 2015) would result in modest net output and employment gains by 2005 that are equal to those projected for the other LAX Master Plan EIS/EIR alternatives. But by 2015, the effects of constrained LAX capacity would yield just slightly more economic output, and actually fewer LAX-related jobs, in the region (and the City and County of Los Angeles) than were there in 1996, as technology and other factors raise the level of output per worker.

2. PURPOSE AND SCOPE OF THE ANALYSIS

2.1 Introduction

This report presents estimates of the economic impacts of LAX Master Plan Alternative D - Enhanced Safety and Security Plan on the economy of Southern California, particularly Los Angeles County and its political subdivisions, including the City of Los Angeles (City). The estimates presented here are intended to assist the City Council, the staff and governing board of LAWA, the operator of LAX, and the general public, in the process of assessing the relative merits of the LAX Master Plan alternatives.

This report was prepared by Hamilton, Rabinovitz & Alschuler, Inc. (HR&A), under a subcontract to Camp Dresser and McKee, Inc. a principal consultant to LAWA. This report, and the analysis contained in it, builds on the work contained in Technical Report 5, *Economic Impacts Technical Report*, of the Draft EIS/EIR concerning the economic and employment impacts of the No Action/No Project Alternative and Alternatives A, B, and C, which was also prepared by HR&A.

2.2 Overview of Los Angeles International Airport

An overview of LAX, its role in the regional air transportation system, and a summary of forecasted demand for air passengers and air cargo are provided in Section 2.2 of Technical Report 5, *Economic Impacts Technical Report*, of the Draft EIS/EIR.

2.3 Purpose of the Analysis

Though not strictly required as part of either an EIS or EIR, an assessment of economic impacts is clearly an important consideration in the decision making process about the future of LAX. In addition, some of the EIS/EIR analysis topics are related to the effects of each alternative on the regional economy. This report presents estimates of the impact that Alternative D would have on the regional economy in terms of total economic output (i.e., a general measure of total economic activity) and employment, including both its construction and of operation of the airport following construction. This economic impact analysis will be used in assessing various environmental topics (e.g., socioeconomics, public schools and induced growth) in the Supplement to the Draft EIS/EIR, as well as informing City decision-makers and the public about the possible economic consequences of Alternative D, and how these impacts compare with the other four alternatives analyzed in the Draft EIS/EIR. The methods used to prepare the impact estimates for Alternative D are the same as those contained in the Draft EIS/EIR, and thus the results reported

herein are directly comparable to those for the other four alternatives, as reported in the Draft EIS/EIR and its associated Technical Report 5, *Economic Impacts Technical Report*.

2.4 Organization of the Report

The five sections of the report that follow this general introduction are as follows:

- **Section 3. Methodology for Assessing the Economic Impacts of LAX and the LAX Master Plan EIS/EIR Alternatives**. This section notes that the methodology used to estimate the economic impacts of Alternative D is the same as that used to estimate the impacts of the other alternatives analyzed in the Draft EIS/EIR.
- **Section 4. Overview of LAX's Role in the Los Angeles Regional Economy.** This section identifies changes in the economy of Southern California through the Year 2000. A complete discussion of the economy of Southern California, and LAX's interactions with it, including case studies of specific industries that make extensive use of LAX, and are dependent on LAX, are included in Section 4 of Technical Report 5, *Economic Impacts Technical Report,* of the Draft EIS/EIR.
- **Section 5. Summary of Regional Impacts of LAX Master Plan Alternative D.** This section presents the results of applying the analytic framework summarized in Section 4 to Alternative D, defined in terms of millions of annual passengers and tons of air cargo. The estimates of economic impact in 2005 and 2015 are presented in terms of total economic output – a summary measure of economic activity – and employment. Estimates are also presented for the number of households and population associated with on-site LAX-related employment.
- **Section 6. Geographic Distribution of LAX Employment Impacts.** Next, the direct regional employment impacts presented in Section 5 are disaggregated by several geographic perspectives – by county and several subareas of Los Angeles County, including the City of Los Angeles and the other South Bay cities and communities that are immediately adjacent to LAX. Within the City of Los Angeles, the estimates are further disaggregated by Community Plan Areas.
- **Section 7. Conclusions.** The final section provides summary observations about the significance of LAX to the regional economy, today and under LAX Master Plan Alternative D.

3. METHODOLOGY FOR ASSESSING ECONOMIC IMPACTS

To estimate the economic impacts of LAX under LAX Master Plan Alternative D, baseline employment and economic output conditions are compared with conditions under Alternative D in 2015 and over the period 1996-2015. The analytic approach is the same one used to estimate the impacts of the alternatives addressed in the Draft EIS/EIR. The details of the analytic approach are contained in Section 3 of Technical Report 5, *Economic Impacts Technical Report*, of the Draft EIS/EIR.

Construction-related economic impacts in Los Angeles County are also presented for Alternative D. As with the alternatives analyzed in the Draft EIS/EIR, the economic impacts of the expenditures that would be made for building Alternative D were estimated from the IMPLAN input-output model for Los Angeles County and are based on construction cost estimates prepared for the proposed Master Plan alternatives. The cost estimate line items, excluding land acquisition, were linked with their corresponding industry sectors in the IMPLAN model to produce estimates of employment and total economic output in Los Angeles County that would result from construction of Alternative D.

4. OVERVIEW OF LAX'S ROLE IN THE LOS ANGELES REGIONAL ECONOMY

A detailed discussion of LAX's role in the Los Angeles Regional Economy is provided in Section 4 of Technical Report 5, *Economic Impacts Technical Report*, of the Draft EIS/EIR. A brief discussion of basic industry employment in Southern California, including changes through the Year 2000, is provided below.

Table S3, Basic Industry Employment in the Southern California Region, 1972-1997, summarizes employment growth in seven major industry sectors of the region's economic base between 1972 and

1997. Most of the new jobs in basic industries were created in the services sector, particularly professional services and tourism/entertainment, both of which had job gains over 100 percent between 1972 and 1992, and double-digit gains between 1992 and 1997. The three manufacturing sectors – defense-related, high technology and diversified manufacturing – had only modest job growth between 1972 and 1992, and they all experienced job losses between 1992 and 1997.

Table S3

Basic Industry Employment in the Southern California Region, 1972-1997

Industry Sector	1972	1992	1997	1972-1992 Growth		1992-1997 Growth	
				Number	Percent	Number	Percent
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 and Wholesale	329.5	526.5	561.5	197.0	59.8%	35.0	6.6%
Tourism and 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	38.2	48.6%	-42.7	-36.6%
High Technology Manufacturing	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.

Between 1997 and 2000, there was further modest growth in the region's basic industry employment (196,000 jobs), led by professional services (124,000 jobs) and transportation and wholesale trade (50,000 jobs). Defense-related manufacturing declined further (-24,000 jobs), but there were small increases in diversified manufacturing (29,000 jobs) and high-technology manufacturing (5,000 jobs), as well as 12,000 additional jobs in the tourism and entertainments sector.

The regional employment outlook depends to a great extent on the health of the California and national economies. Foreign trade, high-technology manufacturing, professional services and tourism and entertainment, in particular, propelled the State's economy during the 1980s. These sectors are particularly significant because: (a) they are expected to have above-average growth in national and international markets; (b) California has a high and rising share of U.S. jobs and output in these sectors; and (c) all four sectors play a significant role in the Southern California economy.

The entire State of California economy fared worse than the U.S. economy as a whole during the recession of the early 1990s. However, California experienced rapid job growth after 1994 in almost all major sectors. Most of the job gains occurred in services (497,300 new jobs) and trade (193,200), with the fastest rates of increase occurring in construction (18.8%) and services (14.0%). The 1990-1997 employment trends are shown in **Table S4**, California Jobs by Major Industry Sector, 1992-1997.

Table S4

California Jobs By Major Industry Sector, 1990-1997 (in thousands)

Sector	1990	1994	1997	Change 1990-1994 Number	Change 1990-1994 Percent	Change 1994-1997 Number	Change 1994-1997 Percent
Agriculture	363.6	379.7	401.5	16.1	4.4%	21.8	5.7%
Mining	37.7	31.9	29.4	-5.8	-15.4%	-2.5	-7.8%
Construction	561.8	464.3	551.7	-97.5	-17.4%	87.4	18.8%
Manufacturing	2,068.8	1,777.3	1,907.7	-291.5	-14.1%	130.4	7.3%
Transp., Public Util.	612.2	619.0	663.1	6.8	1.1%	44.1	7.1%
Trade	2,992.7	2,845.1	3,038.3	-147.6	-4.9%	193.2	6.8%
Fin., Ins., Real Estate	808.8	770.6	756.9	-38.2	-4.7%	-13.7	-1.8%
Services	3,343.1	3,558.2	4,055.5	215.1	6.4%	497.3	14.0%
Government	2,074.8	2,093.2	2,151.8	18.4	0.9%	58.6	2.8%
Total	**12,863.5**	**12,539.3**	**13,555.9**	**324.2**	**2.5%**	**1,016.6**	**9.9%**

Source: California Employment Development Dept., Center for Continuing Study of the California Economy, HR&A

In the last three years of the decade, total employment in the State grew by another 1.3 million jobs (10%), with the largest gains in services (557,400 jobs), trade (257,300 jobs) and construction (175,200).

Further discussion about the prospects for future regional and State economic growth are discussed in Technical Report 5 of the Draft EIS/EIR.

5. ECONOMIC IMPACTS OF MASTER PLAN ALTERNATIVE D

This section presents projections of the economic impacts of LAX Master Plan Alternative D using the estimation framework summarized above, which is the same approach that was used to analyze the other four alternatives in the Draft EIS/EIR. As in the analysis of the other alternatives, this analysis of Alternative D impacts is expressed in terms of employment and total economic output for the five-county Southern California region.

Estimates of population and households associated with on-site employment at LAX are also presented. These estimates were made using the regional distribution of the households of employees working at LAX as of 1990, which was derived from a special data set available from the 1990 U.S. Census. No comparable data set is available yet from the 2000 census.

Construction-related economic impacts in Los Angeles County are also presented for Alternative D. These impacts were estimated from the IMPLAN input-output model for Los Angeles County and are based on construction cost estimates prepared by the LAX Master Plan project team.

All dollar amounts of economic output in this section are expressed in constant 1996 dollars, unless noted otherwise. The calculation factor details for the economic output analysis are presented in Appendix A.

5.1 Description of Alternative D

Alternative D would provide a new landside Ground Transportation Center (GTC) to the east of the existing Central Terminal Area (CTA) and would include airfield modifications that would improve the level of service at LAX. Alternative D would also include space for additional gate facilities on the west side of the Tom Bradley International Terminal (TBIT) and for a new linear concourse to the west of TBIT. Runway 24L would be moved to the south to allow a parallel taxiway to be constructed between the north runways in order to reduce the potential for runway incursions. This would require the demolition of the pier concourses associated with Terminals 1, 2, 3, and the TBIT north concourse. An east/west linear concourse would be constructed in their place.

The net result would be the ability to accommodate larger gates at a higher level of service than in the No Action/No Project Alternative. Because the gate frontage available in Alternative D would be more similar

to existing conditions than Alternative C, the average aircraft size associated with Alternative D is similar to the No Action/No Project Alternative. However, the landside and terminal improvements would allow more international and origin and destination demand to be served than in the No Action/No Project Alternative.

Although Alternative D consists of a four-runway airfield system that is capable of accommodating 89.6 MAP (i.e., the same level of activity as Alternative C), the proposed gate facilities cannot accommodate this level of activity. Instead, Alternative D would be able to accommodate 78.9 million annual passengers (MAP), or slightly more passengers than the No Action/No Project Alternative. This is also slightly higher than the Southern California Association of Government's (SCAG) estimation of the capacity of the existing airport facilities. The existing facility capacity estimations in the LAX Master Plan were determined using a different method than SCAG used, but the two approaches resulted in similar projections that differ by only about one percent.

While the annual passenger capacity associated with Alternative D is very similar to the No Action/No Project Alternative, the makeup of that activity is very different. The number of air carrier operations is less than the No Action/No Project Alternative due the reduced gate frontage. However, the size of the domestic fleet is larger in Alternative D than with the No Action/No Project Alternative. There would be more international activity in Alternative D than in the No Action/No Project Alternative but the enplanements/departure ratio would be slightly lower than the No Action/No Project Alternative due to the gate restrictions.

Construction of the improvements included in Alternative D would enable LAX to accommodate 71.2 MAP by 2005. By 2015, completion of the Alternative D improvements would enable LAX to accommodate 78.9 MAP, or slightly more passengers than the No Action/No Project Alternative (78.7 MAP), but considerably less than any of the other build alternatives (89.6-97.9 MAP). These improvements would also enable LAX to handle 3.1 million tons of cargo annually in 2005, with no further increase by 2015. This is the air cargo volume assumed for the No Action/No Project Alternative, and about one million tons less in 2015 than any of the other build alternatives.

5.2 Construction Impacts

URS Corporation estimates that the cost of constructing Alternative D would total about $7.4 billion (in 2002 $) over the period 2004 to 2015. **Table S5,** Order of Magnitude Cost Estimate for Construction of Alternative D**,** presents the component costs in this estimate.

Table S5

Order of Magnitude Cost Estimate for Construction of Alternative D (in millions of 1997 $)

Cost Category	Amount
Airfield Facilities	
North Airfield	$730
South Airfield	223
Subtotal	**$953**
Terminal Facilities/Systems	
Central Terminal Area	$1,806
West Terminal Area	1,772
Subtotal	**$3,528**
Parking Facilities	**$1,079**
Cargo Facilities	**$ 0**
Ancillary Facilities	**$ 365**
Land Acquisition/Relocation	**$ 186**
Regional Transportation	
Roadways	**$396**
Automatic People Mover	851
Transit	0
Subtotal	**$1,247**
Total (in 2002 $)	**$7,358**
Total not including Land & Relocation (in 2002 $)	**$7,172**
Total not including Land & Relocation (in 1997 $)	**$6,367**

Source: URS Corporation, 2003; HR&A, Inc., 2003.

Construction expenditures on this scale, but not including land acquisition and relocation,[4] will support 48,778 jobs directly involved in building the improvements required for Alternative D over the 11 year duration of the construction process. When the "multiplier" effect of these construction expenditures is taken into account, the total employment impact in Los Angeles County from constructing Alternative D is 102,244 jobs. The direct expenditure to construct Alternative D (not including land acquisition and relocation) would also yield $11.3 billion (1997 $)[5] in total economic output in Los Angeles County, including the multiplier effect of the direct construction expenditure. These results are summarized in **Table S6**, Summary of Employment and Economic Output Impacts in Los Angeles County from Construction of Plan Alternative D (individual jobs and millions of 1997 $).

Table S6

Summary of Employment and Economic Output Impacts in Los Angeles County from Construction of Alternative D (individual jobs and millions of 1997 $)

Industry Sector	Employment	Economic Output
All Sectors (includes Industrial/Commercial Buildings, Roads/Highways, etc.)	102,244	$11,326

Source: HR&A, Inc., 2003.

[4] Expenditures for land acquisition and relocation costs generally do not circulate through the County economy in the same ways that construction expenditures do, and therefore are omitted in this analysis, as they were in the Draft EIS/EIR analysis of Alternatives A, B, and C.

[5] Output impacts are expressed in 1997 dollars for direct comparison with estimates that were prepared for the Draft EIS/EIR Alternatives A, B, and C, which were also expressed in 1997 dollars.

5.3 Employment Impacts

Based on the per MAP and per-MAT relationships developed through HR&A's analysis, it is estimated that Alternative D would support 424,968 jobs in the five-county Southern California region in 2005, and about 350,557 jobs in 2015. The decline in total jobs over the planning period shows clearly that productivity increases (i.e., producing more economic output per worker) overwhelm the incremental new jobs associated with the very limited growth in MAP and MAT in this Alternative. This effect occurs in every industry sector, but particularly the manufacturing sectors related to air cargo activity, as shown in **Table S7** Direct Employment Impacts in the So. California Region, Alternative D, by REMI Model Sector, 1996, 2005 and 2015.

Table S7

Direct Employment Impacts in the So. California Region, Alternative D, by REMI Model Industry Sector, 1996, 2005 and 2015

REMI Model Sector	Base Year 1996	No Action/No Project 2005	No Action/No Project 2015
Furniture Mfg.	5,688	5,275	5,043
Primary Metals Mfg.	3,438	3,043	2,434
Fabricated Metals Mfg.	10,889	9,672	7,994
Industrial Machinery Mfg.	38,992	36,840	24,379
Electronic Equipment. Mfg.	28,280	23,741	15,585
Transportation Equipment. Mfg.	53,278	52,578	49,526
Instruments Mfg.	51,340	44,585	32,368
Miscellaneous Mfg.	5,020	4,752	3,533
Food & Kindred Products Mfg.	1,559	1,552	1,286
Tobacco Products Mfg.	8	5	5
Textile Mill Products Mfg.	743	672	489
Apparel Mfg.	24,086	19,431	12,236
Paper Products Mfg.	1,597	1,626	1,295
Printing And Publishing	6,463	6,884	6,240
Chemical And Allied Prods. Mfg.	3,385	3,375	2,620
Rubber & Plastics Mfg.	6,653	7,347	6,014
Leather Mfg.	495	425	157
Local Interurban Passenger Transportation	7,476	8,582	7,489
Air Transportation	48,711	53,535	42,918
Eating/Drinking Establishments	33,990	43,601	41,929
Other Retail Trade	12,432	13,538	11,632
Hotels	31,369	46,680	43,268
Auto Repair	5,345	6,584	6,049
Amusement & Recreation	26,436	30,549	26,068
Regional Total [1]	**407,670**	**424,968**	**350,557**
Los Angeles County Total	**327,683**	**347,710**	**294,613**
City of Los Angeles Total	**157,657**	**167,050**	**138,725**
Total Annual Passengers (millions)	**57.97**	**71.2**	**78.9**
Total Annual Cargo Tons (millions)	**1.9**	**3.1**	**3.1**

[1] Totals may not sum precisely due to independent rounding.

Source: HR&A, Inc., 2003.

Consistent with the MAP and MAT relationships between Alternative D and the other LAX Master Plan alternatives, Alternative D implies marginally higher regional employment compared with the No Action/No Project Alternative, and less employment than with the other three build alternatives that were analyzed in the Draft EIS/EIR.

5.4 Economic Output Impacts

It is also estimated that, under Alternative D, LAX would have a $73.2 billion direct impact on the Southern California economy in 2005, but this would decline to $63.7 billion in 2015. The pattern of decline would also occur for the Los Angeles County and City of Los Angeles economies, though at a smaller scale relative to the regional decline. These relationships, for the region, Los Angeles County and the City of Los Angeles, are shown in **Table S8,** Direct Economic Output Impact in the So. California Economy, Alternative D, 1996, 2005 and 2015. These results are slightly larger than the No Action/No Project Alternative, but less than the other three build alternatives, consistent with each alternative's MAP and MAT activity levels.

Table S8

Direct Economic Output Impact in the So. California Economy, Alternative D, 1996, 2005 and 2015 (in millions of 1996 $)

Geographic Area	1996	2005	2015
So. California Region	$60,439	$73,210	$63,729
Los Angeles County	$48,603	$60,567	$52,298
City of Los Angeles	$20,868	$26,050	$22,198

Source: HR&A, Inc., 2003.

5.5 Population and Households Impacts

Assuming that employees at LAX have household characteristics and residential location patterns that are similar in 2005 and 2015 to what they were in 1990, it is possible to estimate the number of households and related household population associated with on-airport employment[6] in 2005 and 2015 under Alternative D. As shown in **Table S9**, Households and Population Impacts of On-Airport Direct LAX Employment Alternative D, 1996-2015, it is estimated that Alternative D would result in a net increase of about 1,156 on-airport jobs between 1996 and 2005, but a net decrease of about 9,261 on-airport jobs over the entire planning period, 1996-2015. This same pattern – a net increase in population and households from 1996-2005, and then a net decrease between 1996-2015 – holds for both the City and County of Los Angeles as well as the entire Los Angels region. Once again, these estimates include the effects of labor (and related household and population) contractions in the underlying 1996 base year employment total, due to productivity improvements over time.

[6] "On-airport" employees are defined as those working at LAX and immediately surrounding locations within census tracts 2766.02, 2772.00, 2774.00, 2780.00, 2781.00 (LAX), 6014.00, and 6016.00.

Table S9

Households and Population Impacts of On-Airport Direct LAX Employment, Alternative D, 1996-2015

Analysis Area/Category	1996 Base Year	1996-2005 Growth	1996-2015 Growth
On-Airport Employment	58,966	1,156	-9,261
City of Los Angeles			
Employee Households	18,976	372	-2,980
Hhld. Population	56,783	1,113	-8,919
Los Angeles County			
Employee Households	41,039	806	-6,455
Hhld. Population	117,541	2,304	-18,460
Los Angeles Region			
Employee Households	44,261	868	-6,952
Hhld. Population	126,657	2,483	-19,893

Source: HR&A, Inc., 2003.

5.6 Summary of the Economic and Employment Impacts of the Alternatives

Table S10, Summary of Direct Economic Output Impacts in the So. California Economy, By LAX Master Plan Alternative and Area, 1996, 2005 and 2015, presents a comparative summary of the regional economic output estimates for the LAX Master Plan alternatives, including Alternative D, for 1996, 2005 and 2015, by area of the region. **Table S11**, Summary of Direct Employment Impacts in the So. California Economy, by LAX Master Plan Alternative and Area, 1996, 2005 and 2015, provides the same kind of comparison of the alternatives for employment impacts.

Table S10

Summary of Direct Economic Output Impacts in the So. California Economy, by LAX Master Plan Alternative and Area, 1996, 2005 and 2015 (in millions of 1996 $)

Geographic Area	1996	2005	2015
So. California Region			
No Action/No Project	$60,439	$73,210	$63,697
Alternatives A & B	60,439	73,210	83,726
Alternative C	60,439	73,210	82,175
Alternative D	60,439	73,210	63,729
Los Angeles County			
No Action/No Project	$48,603	$60,567	$52,271
Alternatives A & B	48,603	60,567	72,031
Alternative C	48,603	60,567	70,652
Alternative D	48,603	60,567	52,298
City of Los Angeles			
No Action/No Project	$20,868	$26,050	$22,186
Alternatives A & B	20,868	26,050	31,455
Alternative C	20,868	26,050	30,196
Alternative D	20,868	26,050	22,198

Source: HR&A, Inc., 2003.

Table S11

Summary of Direct Employment Impacts in the So. California Economy, by LAX Master Plan Alternative and Area, 1996, 2005 and 2015

Geographic Area	1996	2005	2015
So. California Region			
No Action/No Project	407,670	424,968	350,110
Alternatives A & B	407,670	424,968	448,083
Alternative C	407,670	424,968	425,369
Alternative D	407,670	424,968	350,557
Los Angeles County			
No Action/No Project	327,683	347,710	294,237
Alternatives A & B	327,683	347,710	375,550
Alternative C	327,683	347,710	357,140
Alternative D	327,683	347,710	294,613
City of Los Angeles			
No Action/No Project	157,657	167,050	138,548
Alternatives A & B	157,657	167,050	185,829
Alternative C	157,657	167,050	173,726
Alternative D	157,657	167,050	138,725

Source: HR&A, Inc., 2003.

6. GEOGRAPHIC DISTRIBUTIONS OF EMPLOYMENT IMPACTS OF ALTERNATIVE D

This section presents a disaggregation of the regional employment impacts presented in the preceding Section 5, by county and several subareas of Los Angeles County, including the City of Los Angeles and other cities and communities immediately adjacent to LAX. Within the City of Los Angeles, the estimates are further disaggregated by Community Plan Areas.

6.1 The Geographic Distribution Model

The geographic distribution model used for the analysis of Alternative D is the same model that was used to analyze the other four LAX Master Plan alternatives in the Draft EIS/EIR and is described in detail in Technical Report 5, *Economic Impacts Technical Report,* of the Draft EIS/EIR.

6.2 Direct Jobs Distribution by REMI Model Areas

Based on the air passenger and air cargo volumes associated with each LAX Master Plan alternative,[7] HR&A's method of categorizing direct jobs and applying the REMI models as described in Technical Report 5, *Economic Impacts Technical Report*, of the Draft EIS/EIR, it is estimated that the total number of jobs associated with the LAX Master Plan alternatives in 2015 will range from about 350,000 to about 448,000, and between 46,000-144,000 incremental jobs between 1996 and 2015, as shown in **Table S12**, Total and Incremental Direct Employment in So. California, by LAX Master Plan Alternative and REMI Model Area. About 84 percent of these jobs will be located in Los Angeles County and the balance in the remaining four Southern California counties.

[7] These assumptions are: 78.7 MAP for the No Action/No Project Alternative, 97.9 MAP for Alternatives A and B, 89.6 MAP for Alternative C and 78.9 MAP for Alternative D (versus 98.0 MAP in the demand forecast); and 4.2 million annual tons of air cargo in Alternatives A, B and C, and 3.1 million annual tons in the No Action/No Project Alternative and Alternative D (versus 4.2 million annual tons in the demand forecast).

Table S12

Total and Incremental Direct Employment in So. California, LAX Master Plan Alternative and REMI Model Area

	No Action/No Project		Alternatives A & B		Alternative C		Alternative D	
Geographic Area	**Number**	**% of Total**	**Number**	**% of Total**	**Number**	**% of Total**	**Number**	**% of Total**
Incremental Jobs 1996-2015								
LA1 (LA County)	49,729	107.1%	131,042	90.8%	112,632	92.6%	49,792	107.1%
LA2 (Other 4 Counties)	(3,307)	-7.1%	13,353	9.2%	9,049	7.4%	(3,311)	-7.1%
Total[1]	46,422	100.0%	144,395	100.0%	121,681	100.0%	46,481	100.0%
Total Jobs in 2015								
LA1 (LA County)	294,237	84.0%	375,550	83.8%	357,140	84.0%	294,613	84.0%
LA2 (Other 4 Counties)	55,873	16.0%	72,533	16.2%	68,229	16.0%	55,944	16.0%
Total[1]	**350,110**	**100.0%**	**448,083**	**100.0%**	**68,229**	**100.0%**	**350,557**	**100.0%**

[1] Totals may not sum precisely due to independent rounding.

Source: HR&A, Inc., 2003.

6.3 Direct Job Impacts By County and City

Los Angeles County is projected to capture between 83%-94% of incremental and total jobs, depending on the LAX Master Plan alternative. A non-trivial number would also be created in Orange County (between 4%-10% of the regional total) under Alternatives A, B, and C, jobs would be lost in Orange County under the No Action/No Project Alternative and Alternative D. The City of Los Angeles is projected to capture roughly four of every 10 incremental and total LAX-related jobs, regardless of the alternative. The sum of jobs in the smaller incorporated cities and unincorporated communities immediately adjacent to LAX (i.e., the Draft EIS/EIR primary impact area) would, taken together, capture between three and six percent of the incremental jobs (about 2,700-4,900) and total jobs (13,000-15,000). These relationships are shown in **Table S13**, Distribution of Incremental Direct Job Impacts of the LAX Master Plan Alternatives, by County and City, 1996-2015, and **Table S14** Distribution of Total Direct Job Impacts of the LAX Master Plan Alternatives, by County and City, 1996-2015.

Table S13

Distribution of Incremental Direct Job Impacts of the LAX Master Plan Alternatives, by County and City, 1996-2015

	No Action/No Project		Alternatives A & B		Alternative C		Alternative D	
Geographic Area	**Number**	**% of Total[3]**	**Number**	**% of Total**	**Number**	**% of Total**	**Number**	**% of Total**
LA County								
City of LA	16,434	35.4%	63,714	44.1%	51,611	42.4%	16,455	35.4%
Primary LAX Area[1]	2,719	5.9%	4,880	3.4%	4,640	3.8%	2,722	5.9%
Secondary LAX Area[2]	4,966	10.7%	10,849	7.5%	9,485	7.8%	4,972	10.7%
Remainder of County	25,610	55.2%	51,599	35.7%	46,896	38.5%	25,642	55.2%
Subtotal	**49,729**	**107.1%**	**131,042**	**90.8%**	**112,632**	**92.6%**	**49,792**	**107.1%**
Orange County								
Anaheim	(576)	-1.2%	2,405	1.7%	1,597	1.3%	(576)	-1.2%
Remainder of County	(2,134)	-4.6%	4,242	2.9%	2,816	2.3%	(2,137)	-4.6%
Subtotal	**(2,710)**	**-5.8%**	**6,647**	**4.6%**	**4,413**	**3.6%**	**(2,713)**	**-5.8%**
Riverside County	65	0.1%	3,132	2.2%	2,206	1.8%	65	0.1%
San Bernardino Co.								
Ontario	171	0.4%	822	0.6%	566	0.5%	171	0.4%
Remainder of County	-418	-0.9%	1,525	1.1%	1,051	0.9%	(418)	-0.9%
Subtotal	**(247)**	**-0.5%**	**2,347**	**1.6%**	**1,617**	**1.3%**	**(247)**	**-0.5%**
Ventura County	(416)	-0.9%	1,228	0.9%	813	0.6%	(417)	-0.9%
Total (5 Counties) [3]	**46,422**	**100.0%**	**144,395**	**100.0%**	**121,681**	**100.0%**	**46,481**	**100.0%**

[1] Includes the Cities of El Segundo, Hawthorne, Inglewood, and the unincorporated communities of Del Aire and Lennox.

[2] Includes Culver City, Gardena, Hermosa Beach, Lawndale, Lomita, Manhattan Beach, Redondo Beach, Santa Monica and Torrance and the unincorporated communities of Ladera Heights, Marina Del Rey and View Park-Windsor Hills.

[3] Subtotals and total may not sum precisely due to independent rounding.

Source: HR&A, Inc., 2003.

Table S14

Distribution of Total Direct Job Impacts of the LAX Master Plan Alternatives, by County and City, 2015

Geographic Area	No Action /No Project		Alternatives A & B		Alternative C		Alternative D	
	Number	% of Total	Number	% of Total	Number	% of Total	Number	% of Total
LA County								
City of LA	138,548	39.6%	185,829	41.5%	173,726	40.8%	138,725	39.6%
Primary LAX Area[1]	12,559	3.6%	14,720	3.3%	14,481	3.4%	12,575	3.6%
Other 2nd. Area[2]	22,820	6.5%	28,519	6.4%	27,153	6.4%	22,849	6.5%
Remainder of County	120,310	34.4%	146,482	32.7%	141,420	33.3%	120,464	34.4%
Subtotal	**294,237**	**84.0%**	**375,550**	**83.8%**	**357,140**	**84.0%**	**294,613**	**84.0%**
Orange County								
Anaheim	8,718	2.5%	10,472	2.3%	9,983	2.3%	8,729	2.5%
Remainder of Co.	25,723	7.3%	33,325	7.4%	31,625	7.4%	25,755	7.3%
Subtotal	**34,440**	**9.8%**	**43,797**	**9.8%**	**41,563**	**9.8%**	**34,484**	**9.8%**
Riverside County	8,032	2.3%	11,099	2.5%	10,173	2.4%	8,042	2.3%
San Bernardino Co.								
Ontario	3,158	0.9%	4,108	0.9%	3,817	0.9%	3,162	0.9%
Remainder of Co.	4,551	1.3%	6,196	1.4%	5,756	1.4%	4,557	1.3%
Subtotal	**7,710**	**2.2%**	**10,304**	**2.3%**	**9,573**	**2.3%**	**7,720**	**2.2%**
Ventura County	5,691	1.6%	7,334	1.6%	6,920	1.6%	5,698	1.6%
TOTAL (5 Counties)[3]	**350,110**	**100.0%**	**448,083**	**100.0%**	**425,369**	**100.0%**	**350,557**	**100.0%**

[1] Includes the Cities of El Segundo, Hawthorne, Inglewood, and the unincorporated communities of Del Aire and Lennox.

[2] Includes Culver City, Gardena, Hermosa Beach, Lawndale, Lomita, Manhattan Beach, Redondo Beach, Santa Monica and Torrance and the unincorporated communities of Ladera Heights, Marina Del Rey and View Park-Windsor Hills.

[3] Subtotals and total may not sum precisely due to independent rounding.

Source: HR&A, Inc.

The cities and unincorporated communities immediately surrounding LAX to the north and south accounted for about 10 percent of LAX-related jobs in 1996 in the five-county region. Taken together, the South Bay and North Bay cities and communities would experience about half the increase in employment over the 1996-2015 planning period under the No Action/No Project Alternative and Alternative D that they would under each of the three other "build" alternatives, and would have about 15 percent fewer LAX-related jobs in 2015 under No Project and Alternative D than in the other build scenarios, as shown in **Table S15**, LAX-Related Employment in the South Bay and North Bay Cities and Communities, by LAX Master Plan Alternative, 1996, 2005 and 2015.

Table S15

LAX Relocated Employment in the South Bay and North Bay Cities and Communities by LAX Master Plan Alternative, 1996, 2005 and 2015

	Base Year	No Action/No Project		Alternatives A & B		Alternative C		Alternative D	
City/Community	1996	1996-2015	2015	1996-2015	2015	1996-2015	2015	1996-2015	2015
South Bay Area									
Athens (unincorp.)	184	27	180	76	229	64	218	27	180
Del Aire (unincorp.)	49	10	50	30	70	23	64	10	50
El Camino Vlg. (unin.)	70	11	74	48	111	36	99	11	74
El Segundo	4,690	832	3,517	1,437	4,123	1,370	4,056	833	3,521
Gardena	2,923	563	2,592	1,276	3,305	1,104	3,133	564	2,595
Hawthorne	7,238	1,485	6,987	2,251	7,754	2,317	7,820	1,487	6,996
Hermosa Beach	235	45	262	162	380	124	341	45	262
Inglewood	1,762	358	1,786	1,021	2,448	823	2,251	358	1,788
Lawndale	178	43	160	84	201	75	192	43	160
Lennox	188	34	219	141	325	105	290	34	219
Lomita (unincorp.)	163	31	194	124	286	93	255	31	194
Manhattan Beach	1,701	392	1,709	1,003	2,320	825	2,142	393	1,711
Palos Verdes Estates	129	21	129	81	190	61	170	21	129
Rancho Palos Verdes	381	69	396	240	567	185	512	69	397
Redondo Beach	831	141	867	494	1,220	384	1,110	141	868
Rolling Hills	5	1	4	2	5	2	5	1	4
Rolling Hills Estates	60	10	63	41	94	30	84	10	63
Torrance	12,566	2,465	9,885	3,947	11,368	3,857	11,278	2,468	9,898
South Bay Total1	**33,356**	**6,538**	**29,075**	**12,458**	**34,996**	**11,478**	**34,020**	**6,546**	**29,111**
North Bay Area									
Culver City	2,720	490	2,612	1,253	3,376	1,060	3,182	491	2,615
Marina Del Rey (L.A.Co,)	372	69	431	275	638	207	569	69	432
Palms/Mar Vista (L.A.)	156	27	156	92	221	71	201	27	156
Playa Del Rey (L.A.)	313	59	394	261	596	192	527	59	395
Santa Monica	3,667	689	3,884	2,230	5,425	1,756	4,951	690	3,889
Venice (L.A.)	447	84	484	282	682	220	620	84	485
Westchester (L.A.)	623	128	507	253	633	226	605	128	508
North Bay Total[1]	**8,298**	**1,546**	**8,470**	**4,646**	**11,572**	**3,732**	**10,655**	**1,548**	**8,479**
No. Bay+ So. Bay Total[1]	**41,654**	**8,084**	**37,545**	**17,104**	**46,568**	**15,210**	**44,675**	**8,094**	**37,590**
L.A. County Total	327,683	49,729	294,237	131,042	375,550	112,632	357,140	49,792	294,613
So. Bay Percent	10.2%	13.1%	9.9%	9.5%	9.3%	10.2%	9.5%	13.1%	9.9%
No. Bay Percent	2.5%	3.1%	3.9%	3.5%	3.1%	3.3%	3.0%	3.1%	2.9%
No. + So. Bay Percent	**12.7%**	**16.3%**	**12.8%**	**13.1%**	**12.4%**	**13.5%**	**12.5%**	**16.3%**	**12.8%**
Regional Total	407,670	46,422	350,110	144,395	448,083	121,681	425,369	46,481	350,557
So. Bay Percent	8.2%	14.1%	8.3%	8.6%	7.8%	9.4%	8.0%	14.1%	8.3%
No. Bay Percent	2.5%	3.3%	2.4%	3.2%	2.6%	3.1%	2.5%	3.3%	2.4%
No. + So. Bay Percent	**10.2%**	**17.4%**	**10.7%**	**11.8%**	**10.4%**	**12.5%**	**10.5%**	**17.4%**	**10.7%**

[1] Totals may not sum precisely due to independent rounding.

Source: HR&A, Inc., 2003.

Figure S2, Distribution of Total Direct LAX Related Jobs in Southern California, 1996, illustrates the LAX-related direct jobs distribution in 1996. **Figure S3**, Distribution of Total Jobs in Southern California, 2015, Alternative D, illustrates the total (2015) jobs distribution for Alternative D. These distributional patterns are similar to those for Alternatives A, B, and C and the No Action/No Project Alternative.

6.4 Direct Job Impacts Within the City of Los Angeles

Within the City of Los Angeles, Community Plan Areas (CPAs) are subarea groupings that may be informative for impact analysis. Reaggregating the data for the groups of census tracts that correspond with the boundaries of the City's 35 CPAs, shows that the Western area, including the Westchester CPA around LAX, would capture about half (49%-50%) of total direct LAX-related jobs (85,000-93,000 jobs) under the three build alternatives analyzed in the Draft EIS/EIR. Under the No Action/No Project Alternative and Alternative D, the proportion of total jobs captured in the Western area is about the same and still the highest among CPAs, but the absolute number of jobs is lower (about 69,000 total jobs) than under the other three build alternatives. These patterns are shown in **Table S16**, Distribution of the Total Direct Job Impacts of the LAX Master Plan Alternatives, by City of Los Angeles Community Plan Areas, 2015.

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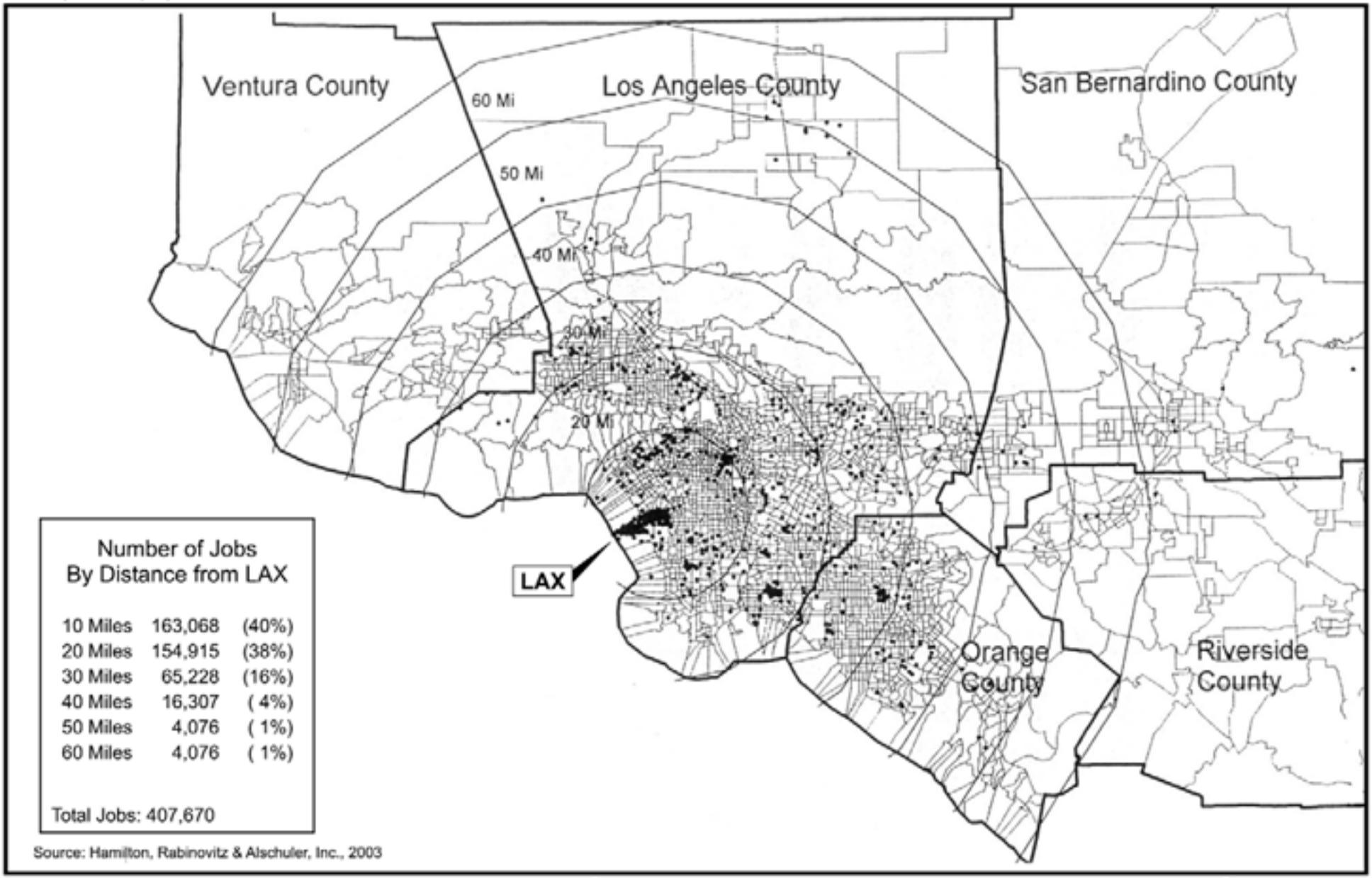

LAX Master Plan **Supplement to the Draft EIS/EIR**	**Distribution of Total Direct LAX-Related Jobs in Southern California, 1996**	Figure **S-2**

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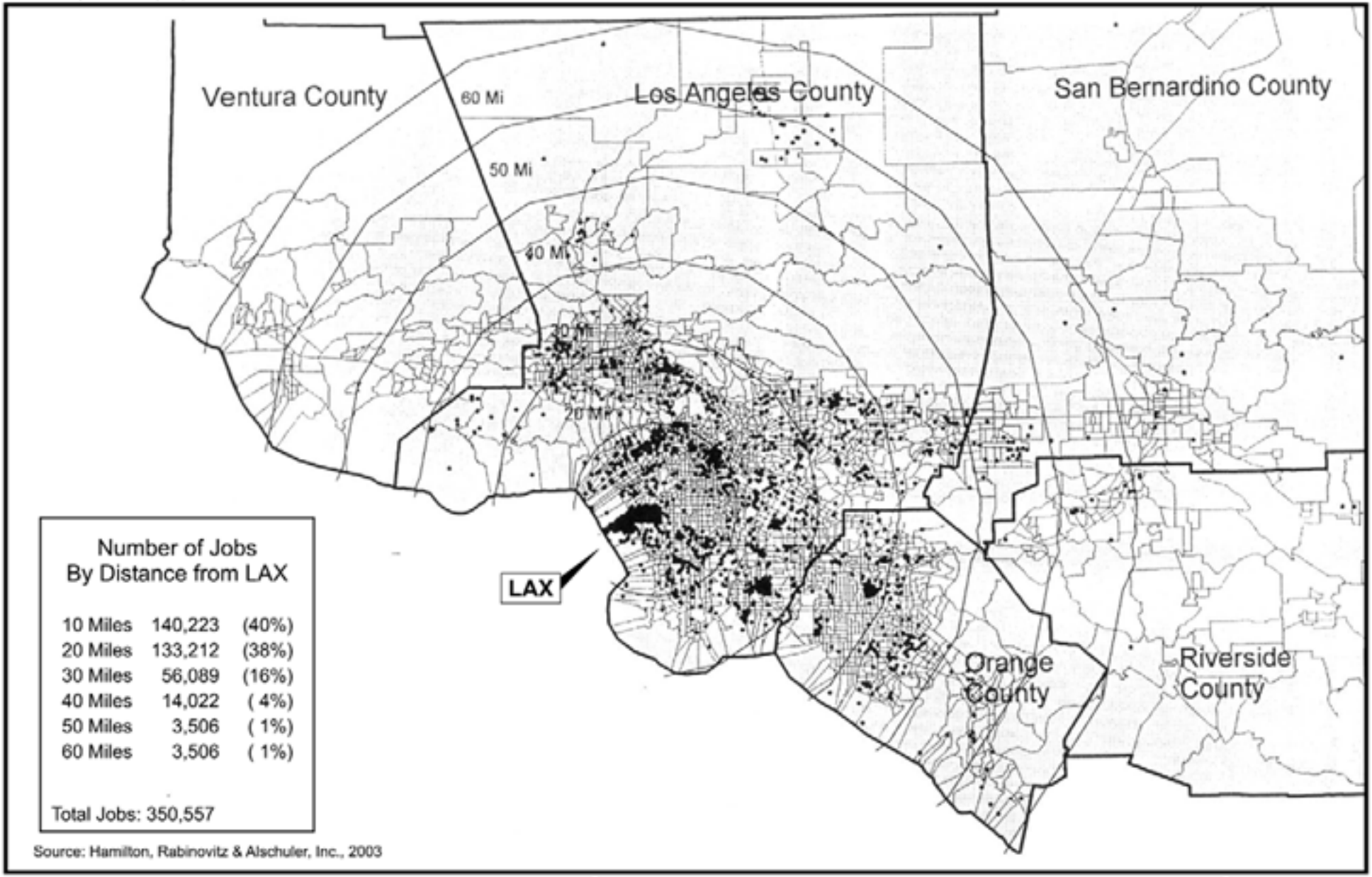

LAX Master Plan **Supplement to the Draft EIS/EIR**	**Distribution of Total Direct Jobs in Southern California, 2015, Alternative D**	Figure **S-3**

Table S16

Distribution of the Total Direct Job Impacts of the LAX Master Plan Alternatives, by City of Los Angeles Community Plan Areas, 2015

	No Action/No Project		Alternatives A & B		Alternative C		Alternative D	
Community Plan Areas	**Number**	**% of Total**	**Number**	**% of Total**	**Number**	**% of Total**	**Number**	**% of Total**
North Valley								
14 Arleta-Pacoima	1,128	0.8%	1,513	0.80%	1,512	0.90%	1,129	0.8%
17 Sun Valley	2,982	2.2%	3,999	2.20%	3,961	2.30%	2,985	2.2%
18 Sylmar	1,273	0.9%	1,707	0.90%	1,714	1.00%	1,274	0.9%
25 Sunland-Tujunga	286	0.2%	384	0.20%	355	0.20%	287	0.2%
16 Mission Hills-Panorama City	845	0.6%	1,134	0.60%	1,060	0.60%	847	0.6%
19 Granada Hills	460	0.3%	617	0.30%	560	0.30%	461	0.3%
21 Chatsworth-Porter Ranch	4,842	3.5%	6,494	3.50%	6,529	3.80%	4,848	3.5%
22 Northridge	799	0.6%	1,071	0.60%	996	0.60%	800	0.6%
Subtotal	**12,614**	**9.1%**	**16,919**	**9.10%**	**16,687**	**9.60%**	**12,630**	**9.1%**
Metro-Southern								
1 NE Los Angeles	2,256	1.6%	3,026	1.60%	2,968	1.70%	2,259	1.6%
2 Boyle Heights	3,363	2.4%	4,511	2.40%	4,522	2.60%	3,368	2.4%
8 Silverlake-Echo Park	671	0.5%	900	0.50%	853	0.50%	672	0.5%
3 SE Los Angeles	3,810	2.7%	5,110	2.70%	5,082	2.90%	3,815	2.7%
5 South Central LA	1,828	1.3%	2,452	1.30%	2,253	1.30%	1,830	1.3%
6 Wilshire	7,688	5.5%	10,311	5.50%	9,424	5.40%	7,697	5.5%
7 Hollywood	7,499	5.4%	10,058	5.40%	9,127	5.30%	7,508	5.4%
9 Westlake	1,581	1.1%	2,121	1.10%	1,922	1.10%	1,583	1.1%
10 Central City	8,543	6.2%	11,459	6.20%	10,629	6.10%	8,554	6.2%
11 N&E Central City	1,220	0.9%	1,636	0.90%	1,594	0.90%	1,221	0.9%
33 Wilmington-Harbor City	1,152	0.8%	1,545	0.80%	1,459	0.80%	1,153	0.8%
34 San Pedro	789	0.6%	1,058	0.60%	971	0.60%	790	0.6%
35 Harbor Gateway	1,857	1.3%	2,491	1.30%	2,429	1.40%	1,860	1.3%
Subtotal	**42,257**	**30.5%**	**56,678**	**30.50%**	**53,235**	**30.60%**	**42,311**	**30.5%**
Western								
4 West Adams-Baldwin Hills	2,184	1.6%	2,929	1.60%	2,710	1.60%	2,187	1.6%
28 Palms-Mar Vista	1,449	1.0%	1,944	1.00%	1,820	1.00%	1,451	1.0%
29 Venice	674	0.5%	904	0.50%	821	0.50%	675	0.5%
30 Westchester-Playa Del Rey	54,556	39.4%	73,174	39.40%	67,813	39.00%	54,626	39.4%
26 Westwood	1,892	1.4%	2,538	1.40%	2,248	1.30%	1,895	1.4%
27 West LA	6,270	4.5%	8,410	4.50%	7,502	4.30%	6,278	4.5%
31 Brentwood-P. Palisades	1,259	0.9%	1,689	0.90%	1,504	0.90%	1,261	0.9%
32 Bel Air-Beverly Crest	743	0.5%	997	0.50%	883	0.50%	744	0.5%
Subtotal	**69,029**	**49.8%**	**92,586**	**49.80%**	**85,302**	**49.10%**	**69,117**	**49.8%**
South Valley								
12 Sherman Oaks-Studio City	2,106	1.5%	2,825	1.50%	2,515	1.40%	2,109	1.5%
13 North Hollywood	1,873	1.4%	2,512	1.40%	2,374	1.40%	1,875	1.4%
15 Van Nuys-No. Sherman Oaks	3,102	2.2%	4,160	2.20%	3,997	2.30%	3,106	2.2%
20 Canoga Park-Winnetka	3,949	2.9%	5,297	2.90%	5,040	2.90%	3,954	2.9%
23 Reseda-W. Van Nuys	2,192	1.6%	2,940	1.60%	2,830	1.60%	2,195	1.6%
24 Encino Tarzana	1,425	1.0%	1,911	1.00%	1,745	1.00%	1,427	1.0%
Subtotal	**14,648**	**10.6%**	**19,647**	**10.60%**	**18,502**	**10.70%**	**14,667**	**10.6%**
Total[1]	**138,548**	**100.0%**	**185,829**	**100.00%**	**173,726**	**100.00%**	**138,725**	**100.0%**

[1] Subtotals and total may not sum precisely due to independent rounding.

Source: HR&A, Inc., 2003.

7. CONCLUSION

The five-county Southern California region would be the world's 12th largest economy were it a separate nation. The region is becoming increasingly integrated with the world economy as international trade flourishes. International trade now accounts for about one-quarter of the region's total economic output.

There can be no doubt that adequate transportation infrastructure -- highway, rail and air -- is critical to facilitating the region's successful participation in the global economy. Airport capacity, particularly for international passengers and airfreight cargo, is particularly essential because of its physical reach and speed. Even as all of the other airports in the region continue to add capacity, LAX will still be dominant, particularly for international travel, the fastest growing segment of the market, due to the overpowering influence of LAX's network characteristics.

In 1996, the base year for the analysis reported here, LAX was directly related to $60 billion[8] in total economic output and about 408,000 jobs, or one out of every 20 jobs in the regional economy. The total includes about 59,000 jobs at LAX, with the balance in a wide range of passenger spending-related jobs and airfreight cargo-related manufacturing jobs in other locations. When the multiplier effect of these direct impacts is taken into account, LAX's impact in the region swells to $110 billion and 932,000 jobs. Most of this impact occurs in the City and County of Los Angeles, and more particularly, within a 20-mile radius around LAX.

If facilities at LAX could be expanded to accommodate its share of future regional air transportation demand by the year 2015, LAX would contribute $84 billion in direct output and 448,000 jobs to the regional economy, including 71,000 jobs at LAX. Taking the multiplier effect into account, LAX's impact could be $127 billion in total economic output and 852,000 jobs by 2015. Compared with a 2015 scenario in which LAX does not expand beyond its annual passenger and cargo volumes as of 1996, there would be a direct cost to the regional economy of $24 billion in lost economic output and about 145,000 incremental foregone jobs, or about 98,000 foregone jobs after accounting for productivity losses in the number of 1996 LAX-related base year jobs. This represents the maximum likely scale of economic opportunity that could be captured by adoption of the LAX Master Plan.

The analysis in this report demonstrates that Alternative D (i.e., incremental passenger growth to 78.9 MAP and 3.1 MAT by 2015) would result in modest net output and employment gains by 2005 that are equal to those projected for the other LAX Master Plan EIS/EIR alternatives. But by 2015, the effects of constrained LAX capacity would yield just slightly more economic output, and actually fewer LAX-related jobs, in the region (and the City and County of Los Angeles) than were there in 1996, as technology and other factors raise the level of output per worker. The output and employment results for Alternative D are slightly greater than for the No Action/No Project Alternative, consistent with their MAP and MAT relationships.

[8] All dollar amounts are expressed in constant 1996 dollars.

8. GLOSSARY, ABBREVIATIONS AND ACRONYMS

Glossary of Terms

Term	Description
Air Cargo	A category of merchandise transported by air. Air cargo consists of both air express and traditional air freight, and is one component used to calculate Annual Air Cargo Tonnage.
Air Transportation Sector	The sector of the economy that includes all of the services generally associated with the operation and use of an airport, including passenger and cargo related air transportation services.
Demand Forecast	A baseline forecast of LAX's impact on the regional economy (measured in terms of employment and total economic output), under the assumption that LAX would operate at a level of activity sufficient to satisfy 100 percent of its share of total demand for air transportation services in the year 2015 (see also *Fixed Activity Forecast*).
Direct Economic Impact	The total employment and total economic output directly related to the operation of LAX, derived from total passenger and cargo activities and the employment related to these activities, both on and off the LAX property.
Econometric Analysis	The use of statistical and mathematical techniques to analyze economic data and make forecasts of future economic activity. Econometric analysis is "dynamic" in that econometric models can measure how relationships between industries and other variables change over time.
Economic Base	A region's economy is comprised of "basic" and "non-basic" industrial sectors. "Basic" industries (or "economic base") are those that export goods and services outside the region and thus bring new income into the region (i.e., aircraft, motion pictures, computer services). "Non-basic industries are those goods and services that are sold inside the region to serve the existing population.
EIS/EIR Alternatives	The various "build" and "no-build" scenarios for the future development of LAX, as specified in the LAX Master Plan Draft EIS/EIR.
Employment	Based on the Bureau of Economic Analysis concept of "place of work." It includes full-time and part-time employees, as well as the self employed, unless otherwise indicated. Employment estimates of the LAX Master Plan EIS/EIR Alternatives were derived from the REMI model's output-employment relationships, adjusted for productivity improvements over time. Estimates of construction-related employment for the Alternatives were derived from the IMPLAN input-output model, based on projected construction expenditures by category of expenditure.
Fixed Activity Forecast	A baseline forecast of LAX's impact on the regional economy (measured in terms of employment and total economic output), under the assumption that LAX is constrained to its 1995 passenger and airfreight cargo activity levels between 1995 and 2015 (see also *Demand Forecast*).

Term	Description
Indirect Economic Impact	The economic impacts not included in the exogenous (direct) change entered through policy variables in the REMI Model. In general, this is the sum of all induced impacts (see definition below) and "intermediate" effects. When differentiated from "direct" and "induced" impacts, "indirect" impacts refer to economic effects resulting from the purchase of inputs for the production of "direct" impact goods.
Induced Impact	The economic impacts resulting from the re-spending of wages related to direct and indirect impacts.
Industry; Industrial Sector	A category of business activity defined by its Standard Industry Classification (SIC).
Input-Output Analysis	A method of estimating economic activity that describes the quantitative relationship between changes in demand (increases and decreases) within an economy for a specified time period, usually a single year.
Just-in-Time	A system of production and logistics in which products are delivered "just in time" to be assembled in to finished goods and delivered "just in time" to be sold and delivered to customers. The purpose of the approach is to reduce inventory-carrying costs and ultimately improve production throughput
Passengers	Persons who purchase tickets to travel by air. For the purposes of forecasting the economic impacts related to LAX, passengers include those who enplane or deplane at LAX, and passenger types includes business travelers, residents of the region, those traveling on flights that connect at LAX, and visitors to the region
Passenger Spending Sectors	Sectors of the economy, other than air transportation, in which local and non-local passengers who enter the region as a consequence of air transportation services at LAX, spend money in the region. These sectors include, for example, car rental agencies, hotels, eating and drinking establishments and amusement and recreation services.
17 Manufacturing Sectors	A set of 17 manufacturing sectors with a significant portion of their output related to airfreight cargo activity at LAX. Each of these sectors produces goods for export by air.
Southern California Region	In this Report, a five-county region of Southern California that includes the counties of Los Angeles, Orange, Riverside, San Bernardino and Ventura. This is similar to the SCAG region, minus Imperial County.
Standard Industry Classification	The U.S. government's system of classifying industries by type of business activity with code numbers. This Report utilizes the 1986 version of the SIC codes for consistency with historical regional and national employment and economic data. The SIC system was recently revised and is now known as the North American Industry Classification System, including industries in the U.S., Mexico and Canada.
Total Economic Output	The total value (in dollars) of goods and services produced in a given region or in a given sector. It can also be thought of simply as total sales or spending. In this Report, the total economic output related to the operation of LAX was calculated as the sum of total passenger-related output and total cargo-related output. Output values were generated from the REMI model in constant 1992 dollars, which were adjusted to constant 1996 dollars using the REMI model's Personal Consumption Expenditure inflation factors.

9. ABBREVIATIONS AND ACRONYMS

Abbreviation/Acronym	Explanation
BUR	Burbank-Glendale-Pasadena Airport
CEQA	California Environmental Quality Act
CCSCE	Center for the Continuing Study of the California Economy
CPA	Community Plan Area (City of Los Angeles)
CTA	Central Terminal Area
CTPP	Census Transportation Planning Packet
EIR	Environmental Impact Report (CEQA)
EIS	Environmental Impact Statement (NEPA)
I-O	Input-Output (analysis or model)
JIT	Just-in-Time
FAA	Federal Aviation Administration
L&B	Landrum & Brown, Inc.
LAWA	Airports (formerly City of Los Angeles Department of Airports)
LAX	Los Angeles International Airport
LGB	Long Beach Airport
MAT	Millions of Annual Air Cargo Tons
MAP	Millions of Annual Passengers
NEPA	National Environmental Policy Act
ONT	Ontario International Airport
Pax	Passengers
PMD	Palmdale
REMI	Regional Econometric Models, Inc.
RIMS II	Regional Input-Output Modeling System
SIC	Standard Industrial Classification
SCAG	Southern California Association of Governments
SNA	John Wayne Airport
TBIT	Tom Bradley International Terminal
UCLA	University of California, Los Angeles

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11. LIST OF PREPARERS

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Attachment A

Calculation Factor Details

Table A1

Passenger and Cargo Factor Details for the LAX Demand Forecast

Area	1996	2005	2015
So. Calif. Region			
Total Economic Output	$60,439	$74,107	$83,742
Total Output/MAP	$1,043	$999	$855
Passenger Output	$11,639	$14,621	$18,670
Pax Output/MAP	$201	$197	$191
Cargo Output	$48,800	$59,486	$65,072
Cargo Output/Ton	$25,684	$9,189	$15,597
Los Angeles County			
Total Economic Output	$48,603	$61,289	$72,917
Total Output/MAP	$838	$826	$744
Passenger Output	$9,360	$12,097	$16,257
Pax Output/MAP	$161	$163	$166
Cargo Output	$39,243	$49,215	$56,660
Cargo Output/Ton	$20,654	$15,876	$13,581
City of Los Angeles			
Total Economic Output	$20,868	$26,370	$31,842
Total Output/MAP	$360	$355	$325
Passenger Output	$4,019	$5,203	$7,099
Pax Output/MAP	$69	$70	$72
Cargo Output	$16,849	$21,168	$24,743
Cargo Output/Ton	$8,868	$6,828	$5,931
Activity Assumptions[1]			
LAX MAP	57.970	74.200	97.960
LAX Cargo Tons (MAT)	1.900	3.100	4.172
Region Direct Jobs			
LAX Passenger Jobs	165,760	216,059	266,980
LAX Cargo Jobs	241,910	221,899	181,336
Region Total	**407,670**	**437,958**	**448,316**
LA County Direct Jobs			
LAX Passenger Jobs	133,237	181,057	223,729
LAX Cargo Jobs	194,446	185,951	151,960
LA County Total	**327,683**	**367,009**	**375,689**
LA City Direct Jobs			
LAX Passenger Jobs	64,104	89,664	110,797
LAX Cargo Jobs	93,553	92,088	75,254
LA City Total	**157,657**	**181,753**	**186,051**

[1] 2005 and 2015 MAP and cargo tons are based on the Demand Forecast, per Landrum & Brown.

Sources: HR&A, Inc.

Table A2

Factor Details for the LAX Master Plan Alternatives
(dollar amounts in 1996 $)

Area	No Action/ No Project		Alt. A		Alt. B		Alt. C		Alt. D	
	2005	2015	2005	2015	2005	2015	2005	2015	2005	2015
So. Calif. Region										
Total Economic Output	$73,210	$63,697	$73,210	$83,726	$73,210	$83,726	$73,210	$82,175	$73,210	$63,729
Total Output/MAP	$1,028	$809	$1,028	$855	$1,028	$855	$1,028	$917	$1,028	$808
Passenger Output	$13,722	$15,035	$13,722	$18,657	$13,722	$18,657	$13,722	$17,105	$13,722	$15,066
Pax Output/MAP	$193	$191	$193	$191	$193	$191	$193	$191	$193	$191
Cargo Output	$59,485	$48,663	$59,485	$65,070	$59,485	$65,070	$59,485	$65,070	$59,485	$48,663
Cargo Output/Ton	$19,066	$15,597	$19,066	$15,597	$19,066	$15,597	$19,066	$15,596	$19,066	$15,597
Los Angeles County										
Total Economic Output	$60,567	$52,271	$60,567	$72,031	$60,567	$72,031	$60,567	$70,652	$60,606	$52,298
Total Output/MAP	$851	$664	$851	$736	$851	$736	$851	$788	$851	$663
Passenger Output	$11,394	$12,338	$11,394	$31,407	$11,394	$31,407	$11,394	$14,706	$11,394	$12,364
Pax Output/MAP	$160	$157	$160	$321	$160	$321	$160	$164	$160	$157
Cargo Output	$49,212	$39,934	$49,212	$40,624	$49,212	$40,624	$49,212	$55,946	$49,212	$39,934
Cargo Output/Ton	$15,773	$12,799	$15,773	$9,737	$15,773	$9,737	$15,773	$13,409	$15,773	$12,799
City of Los Angeles										
Total Economic Output	$26,050	$22,186	$26,050	$31,455	$26,050	$31,455	$26,050	$30,196	$26,050	$22,198
Total Output/MAP	$366	$282	$366	$321	$366	$321	$366	$337	$366	$281
Passenger Output	$4,900	$5,237	$4,900	$7,009	$4,900	$7,009	$4,900	$6,285	$4,900	$5,248
Pax Output/MAP	$69	$67	$69	$72	$69	$72	$69	$70	$69	$67
Cargo Output	$21,166	$16,950	$21,166	$24,445	$21,166	$24,445	$21,166	$23,911	$21,166	$16,950
Cargo Output/Ton	$6,784	$5,433	$6,784	$5,859	$6,784	$5,859	$6,784	$5,731	$6,784	$5,433
Activity Assumptions[1]										
LAX MAP	71.2	78.7	71.2	97.9	71.2	97.9	71.2	89.6	71.2	78.9
LAX Cargo Tons (MAT)	3.1	3.1	3.1	4.2	3.1	4.2	3.1	4.2	3.1	3.1
Region Direct Jobs										
LAX Passenger Jobs	203,069	214,499	203,069	266,747	203,069	266,747	203,069	244,033	203,069	214,946
LAX Cargo Jobs	221,899	135,611	221,899	181,336	221,899	181,336	221,899	181,336	221,899	135,611
Region Total	424,968	350,110	424,968	448,083	424,968	448,083	424,968	425,369	424,968	350,557
LA County Direct Jobs										
LAX Passenger Jobs	166,152	180,268	166,152	223,568	166,152	223,568	166,152	204,890	166,152	180,644
LAX Cargo Jobs	181,558	113,969	181,558	151,982	181,558	151,982	181,558	152,250	181,558	113,969
LA County Total	347,710	294,237	347,710	375,550	347,710	375,550	347,710	357,140	347,710	294,613
LA City Direct Jobs										
LAX Passenger Jobs	79,824	84,883	79,824	110,625	79,824	110,625	79,824	99,666	79,824	85,060
LAX Cargo Jobs	87,226	53,665	87,226	75,204	87,226	75,204	87,226	74,060	87,226	53,665
LA City Total	167,050	138,548	167,050	185,829	167,050	185,829	167,050	173,726	167,050	138,725

[1] 2005 and 2015 MAP and cargo tons are based on the Demand Forecast, per Landrum & Brown.

Sources: HR&A, Inc.