



### **CHAPTER 4**

**Aviation Demand Forecasts** 





**MAY 2008** 

# 4. AVIATION DEMAND FORECASTS

# 4.1 Aviation Demand Forecasts

Prepared by SH&E for the Authority, the Aviation Activity Forecasts were the basis for more detailed, derivative forecasts prepared by HNTB for this Master Plan analysis. The HNTB forecasts are described in this section in addition to a review and validation of the base forecasts prepared by SH&E, which will be essential in determining airport facility requirements, including gate requirements addressed in Chapter 5, Gate Requirements, of this document.

# 4.2 Review and Validation of Forecast

Published in February 2004, the forecast used 2002 as the base year for analysis. The forecast included a low and a high estimate and provided runway-constrained scenarios for each case. The report assessed forecasts for domestic and international passengers, air cargo tonnage, aircraft operations by major category, and fleet mix. The passenger forecast was prepared using a statistical forecasting model based on regional income and air carrier fares, which was similar to the method used in the 2001 Master Plan. Peak hour passenger projections were not evaluated in this effort.

The review and validation of the forecast consists of two steps. First, the assumptions and approach are reviewed for reasonableness, and second, the forecast results are compared with the most recent available information on Airport activity.

## 4.2.1 Approach and Assumptions

The passenger and cargo projections were determined with use of current aircraft operation projections, including a detailed analysis of load factors, existing and projected airline fleet retirements, and known acquisition programs. The constrained forecasts include an in-depth analysis of the factors determining airline reactions to a single runway constrained environment present at SDIA.

However, there are several assumptions in the SH&E forecast which merit further discussion:

- General aviation (GA) operations are projected to increase although recent historical trends suggest a decline. One prediction in particular is not supported with documentation: that a major concentration of fractional ownership programs and business jets would result in an increase in GA operations at SDIA in the future. Additionally, neither of these is a completely new phenomenon at SDIA, and both have failed to halt the gradual decline in GA operations at the Airport.
- Select fleet mix assumptions made for the 2030 forecast are unlikely to materialize. The 2030 forecast assumes an increase in 737-400 series and -500 series aircraft towards the end of forecast period. In 2030 these aircraft would be approximately forty years old and would likely be phased out of the operating fleet of most US airlines due to the maintenance costs required for aircraft of this age. Thus, this assumption is unlikely to materialize.
- The forecast projects a phase-out of turboprop aircraft by 2010. This is consistent with a national trend found in other markets. However, most SDIA turboprops are flown to Los Angeles International Airport (LAX), which is only 109 miles from SDIA. For such short flights, turboprops are more economical than regional jets and may continue to be used for flights between SDIA and LAX, at least until more efficient regional jets emerge.
- The forecast projects a significant shift in the distribution of flights by length-of-haul with a much more rapid increase in long-haul flights than in short-haul flights. This is a reasonable assumption given existing trends and industry economics. This assumption has implications for the hourly distribution of activity. Because of differences in time zones, there is a gap in East Coast arrivals until about 9:00

### 4. Aviation Demand Forecasts

AM. Likewise, there is gap in East Coast departures from about 3:00 PM until late in the evening. As the long-haul component of SDIA activity becomes more prevalent, the hourly distribution of activity will shift with potential implications for facility requirements.

### 4.2.2 <u>Comparison with Actual Activity</u>

**Table 4-1** compares the actual activity to date (through December 2006) with the high and low unconstrained aviation activity forecasts. With the high scenario, the constrained forecast is similar to the unconstrained forecast until 2015. In the low scenario, the constrained forecast is similar the unconstrained forecast until 2022.

As shown in **Table 4-1**, actual passenger enplanements exceed the 2004 high forecast by approximately 3.9 percent and the low forecast by approximately 5.0 percent. The increase above forecast levels is entirely attributable to domestic activity. International enplanements declined significantly in 2004 with the loss of British Airways daily service to London, as well as some service to Canada (though Canadian service has resumed to some degree). Aircraft operations, however, are more closely tracking the low forecast than the high forecast.

The differences between the actual and the forecast activities are still within the range of variability normally expected from year to year. No definitive determination can be made at this time if actual activity is tracking closer to the high forecast or the low forecast.

## 4.2.3 <u>Recommendations</u>

The forecasts are valid in approach and assumptions. The assumptions regarding the GA forecast and fleet mix merit further investigation but do not warrant a revision of the forecasts. Because the forecasts are recent, it is not possible to determine with a degree of reliability whether the low or high forecast will prove more accurate. In planning, the practice is to delay the implementation of improvements if actual activity tracks more slowly than forecast activity. On the contrary, if actual activity outpaces the forecasts, acceleration of the phasing of improvements should be planned. It is recommended to use the high aviation activity forecasts for the purposes of this Master Plan.

#### Table 4-1

Light - Unconstrained <sup>2</sup> Passenger Enplanements   Domestic   7,321,641   7,497,360   7,738,224   8,060,303   8,438,000   9,417,820   12,295,248   15,382,283     International   150,003   141,000   160,000   167,000   342,000   670,000   954,000     Fotal   7,471,644   7,646,360   7,879,224   8,220,303   8,005,000   9,759,820   12,965,248   16,336,283     Operations   "assenger   174,370   178,298   182,226   186,155   190,083   205,796   263,756   326,977     Seneral Aviation <sup>3</sup> 15,044   15,230   15,146   15,601   15,786   16,530   203,482   20,378   203,526   207,701   211,874   228,572   239,889   364,664     cow - Unconstrained <sup>2</sup> "assenger Enplanements   7,321,641   7,497,360   7,647,308   7,755,243   7,900,000   8,502,533   10,544,669   12,922,28     Cotal   7,471,644   7,646,360   7,786,308   7,755,243   7,900,000   38,200,03   15,064,664	-			-		-		-	
Light - Unconstrained <sup>2</sup> Passenger   Passenger<	Activity Category	2002	2003	2004	2005	2006	2010	2020	2030
Passenger Enplanements Domestic   7.321.641   7.497.360   7.738.224   8.060.303   8.438.000   9.417.820   12.295.248   15.382.28     International Total   7.471.644   7.497.360   7.738.224   8.220.303   8.605.000   9.477.820   12.925.248   15.382.28     Operations assenger Cargo   174.170   178.298   182.226   186.155   190.083   205.796   263.756   326.975     Senger Cargo   4.634   4.634   4.755   4.815   4.675   5.116   8.755   11.51     Seneral Aviation <sup>3</sup> 1.0243   1.130	Forecast Activity								
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Total   7,471,644   7,646,360   7,879,224   8,220,303   8,605,000   9,759,820   12,965,248   16,336,283     Deprations Passenger Largo <sup>1</sup> 174,370   178,298   182,226   186,155   190,083   205,796   263,756   326,977     Sargo <sup>1</sup> 4,634   4,694   4,755   4,815   4,875   5,116   8,755   11,513   1,130   1,30   1,30   1,30   1,30   1,30   1,30   1,30   1,30   1,30   1,30   1,30   1,30   1,30   1,30   1,30   1,30   1,30									
Operations   Passenger   174.370   178.298   182.226   186.155   190.083   205.796   263.756   326.637     Pargo <sup>3</sup> 4.634   4.684   4.755   4.815   4.815   4.815   4.815   4.815   4.875   1.511   5.716   16,530   20.348   25.048   25.048   25.048   25.014   1.130   1.136   1.136   1.136   1.136   1.136   1.136   1.130   1.130   1.130   1.130   1.130   1.130   1.130   1.130					· · · · · · · · · · · · · · · · · · ·				
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Dargo <sup>2</sup> 4,634 4,694 4,755 4,815 4,875 5,116 8,755 11,511   Beneral Aviation <sup>3</sup> 15,044 15,230 15,416 15,601 15,786 16,530 20,348 25,048   Gotal 195,301 199,352 203,526 207,701 211,874 228,572 293,989 364,664   Orestic 7,321,641 7,497,360 7,647,308 7,755,243 7,900,000 8,502,533 10,544,669 12,922,28   Ontestic 7,321,641 7,497,360 7,647,308 7,755,243 7,900,000 8,502,533 10,544,669 12,922,28   Ontestic 7,321,641 7,497,360 7,647,308 7,755,243 7,900,000 8,502,533 10,544,669 13,558,28   Operations 38,048,000 8,20,533 11,046,669 13,558,28 36,600 16,650 13,558,28   Operations 38,048,000 8,20,533 11,046,669 13,558,28 36,610 1,030 1,130 1,130 1,130 1,130 1,130 1,130 1,130 1,130 1,130 1,130 1,130 1,	Operations								
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Military 1.253 1.130		,							11,515
Total   199,350   199,352   203,526   207,701   211,874   228,572   293,989   364,664     ow - Unconstrained*   Assenger Enplanements   7,321,641   7,497,360   7,647,308   7,755,243   7,900,000   8,502,533   10,544,669   12,922,28     nemational   150,003   149,000   139,000   144,000   148,000   318,000   502,000   636,000     Total   7,471,644   7,646,360   7,786,308   7,789,243   8,048,000   8,502,533   11,046,669   12,922,28     Operations   238senger   174,370   175,820   177,270   178,720   180,171   185,971   225,444   272,890     Cargo*   4,634   4,645   4,655   4,666   4,676   4,718   6,716   9,011     Senger Enplanements   1,263   1,130   1,130   1,130   1,130   1,130   1,130   1,130   1,130   1,130   1,130   1,25,998     Somestic   7,321,641   7,506,858   8,124,791   8,561,714		,		,		,			
ow - Unconstrained <sup>2</sup> Passenger Enplanements     Domestic   7,321,641   7,497,360   7,647,308   7,755,243   7,900,000   8,502,533   10,544,669   12,922,28     International   150,003   149,000   139,000   144,000   144,000   8,048,000   8,022,533   10,544,669   12,922,28     Operations     Passenger   174,370   175,820   177,270   178,720   180,171   185,971   225,444   272,897     Sargo <sup>3</sup> 4,634   4,655   4,666   4,676   4,718   6,716   9,011     Seneral Aviation <sup>3</sup> 15,044   15,057   15,071   15,084   15,099   15,150   17,239   19,611     Military   1,253   1,130 <td< td=""><td>Military</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></td<>	Military								
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Total   195,301   196,652   198,126   199,599   201,076   206,969   250,529   302,653     Actual Activity <sup>1</sup> Passenger Enplanements   7,321,641   7,506,858   8,124,791   8,561,714   8,633,671     Demestic   7,321,641   7,506,858   8,124,791   8,561,714   8,633,671     International   150,003   130,335   75,896   130,980   125,998     Fotal   7,471,644   7,637,193   8,200,687   8,692,694   8,759,669     Operations   Passenger   174,370   172,790   178,538   190,002   188,830     Cargo   4,634   4,916   4,960   7,206   6,592     General Aviation   15,044   14,535   13,734   13,586   13,657     Military   1,253   1,251   1,241   571   412     Postender   195,301   193,492   198,473   211,365   209,491     Differences <sup>4</sup> High Unconstrained   -2.94%   -2.48%   1.76%   -1.12%				15,071					
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Total 7,471,644 7,637,193 8,200,687 8,692,694 8,759,669   Operations Passenger 174,370 172,790 178,538 190,002 188,830   Cargo 4,634 4,916 4,960 7,206 6,592   General Aviation 15,044 14,535 13,734 13,586 13,657   Military 1,253 1,251 1,241 571 412   Total Actual Activity 195,301 193,492 198,473 211,365 209,491   Differences <sup>4</sup> High Unconstrained Passenger Enplanements 0% -0.12% 4.08% 5.75% 1.80%   Operations 0% -0.12% 4.08% 5.75% 1.80% -1.12%   Cow Unconstrained 0% -0.12% 5.32% 10.04% 8.84%   Operations 0% -0.12% 5.32% 10.04% 8.84%		, ,							
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General Aviation 15,044 14,535 13,734 13,586 13,657   Military 1,253 1,251 1,241 571 412   Total Actual Activity 195,301 193,492 198,473 211,365 209,491   Differences <sup>4</sup> High Unconstrained 0% -0.12% 4.08% 5.75% 1.80%   Operations 0% -2.94% -2.48% 1.76% -1.12%   Low Unconstrained Passenger Enplanements 0% -0.12% 5.32% 10.04% 8.84%   Operations 0% -0.12% 5.32% 10.04% 8.84%   Operations 0% -1.61% 0.18% 5.89% 4.18%	5								
Military 1,253 1,251 1,241 571 412   Total Actual Activity 195,301 193,492 198,473 211,365 209,491   Differences <sup>4</sup> High Unconstrained 0% -0.12% 4.08% 5.75% 1.80%   Operations 0% -2.94% -2.48% 1.76% -1.12%   Low Unconstrained 0% -0.12% 5.32% 10.04% 8.84%   Operations 0% -1.61% 0.18% 5.89% 4.18%	3								
Total Actual Activity   195,301   193,492   198,473   211,365   209,491     Differences <sup>4</sup> High Unconstrained   -0.12%   4.08%   5.75%   1.80%     Passenger Enplanements   0%   -0.12%   4.08%   5.75%   1.80%     Operations   0%   -2.94%   -2.48%   1.76%   -1.12%     Low Unconstrained   -0.12%   5.32%   10.04%   8.84%     Operations   0%   -0.12%   5.32%   10.04%   8.84%     Operations   0%   -1.61%   0.18%   5.89%   4.18%									
Differences <sup>4</sup> High Unconstrained   Passenger Enplanements 0% -0.12% 4.08% 5.75% 1.80%   Operations 0% -2.94% -2.48% 1.76% -1.12%   Low Unconstrained 0% -0.12% 5.32% 10.04% 8.84%   Operations 0% -0.12% 5.32% 10.04% 8.84%   Operations 0% -1.61% 0.18% 5.89% 4.18%	Total Actual Activity								
High Unconstrained     Passenger Enplanements   0%   -0.12%   4.08%   5.75%   1.80%     Operations   0%   -2.94%   -2.48%   1.76%   -1.12%     Low Unconstrained   Passenger Enplanements   0%   -0.12%   5.32%   10.04%   8.84%     Operations   0%   -1.61%   0.18%   5.89%   4.18%									
Passenger Enplanements   0%   -0.12%   4.08%   5.75%   1.80%     Operations   0%   -2.94%   -2.48%   1.76%   -1.12%     Low Unconstrained   Passenger Enplanements   0%   -0.12%   5.32%   10.04%   8.84%     Operations   0%   -1.61%   0.18%   5.89%   4.18%									
Operations   0%   -2.94%   -2.48%   1.76%   -1.12%     Low Unconstrained			a (a)(	4		4.000			
Low Unconstrained Passenger Enplanements 0% -0.12% 5.32% 10.04% 8.84% Operations 0% -1.61% 0.18% 5.89% 4.18%	<b>o</b> ,								
Passenger Enplanements   0%   -0.12%   5.32%   10.04%   8.84%     Operations   0%   -1.61%   0.18%   5.89%   4.18%		0%	-2.94%	-2.48%	1.76%	-1.12%			
Operations 0% -1.61% 0.18% 5.89% 4.18%		00/	0 129/	E 220/	10 04%	0 0 40/			
,									
San Diego International Airport, Air Traffic Reports.	Operations	0%	-1.01%	0.10%	5.09%	4.10%			
	<sup>1</sup> San Diego International Airp	ort, Air Traffic	c Reports.						

#### Comparison of Forecast Aviation Activity Level to Actual Activity Levels Through 2006

2

SH&E, San Diego International Airport, Aviation Activity Forecasts. Values for 2003, 2004, 2005, and 2006 are interpolated.

3

4 Percent by which actual activity level trails or exceeds forecast activity levels.

Sources: As noted and HNTB analysis.

#### AIRPORT MASTER PLAN SAN DIEGO INTERNATIONAL AIRPORT

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