Chapter 4

DEMAND FINDINGS AND BASELINE SCENARIO

This chapter presents a summary of (1) the myriad factors that affect aviation demand in San Diego County; and (2) the Baseline or “do-nothing” scenario upon which all other alternatives will be compared.

As evidenced in the following sections, although San Diego International provides good domestic air service at competitive airfares, some San Diego County residents choose to use airports in the greater Los Angeles metropolitan region and Tijuana in order to capitalize on enhanced air service options. Therefore, RASP strategies, alternatives, and findings were considered in the context of the San Diego County Airport System, as well as a larger region inclusive of Tijuana and the following five airports in the greater Los Angeles metropolitan area: Los Angeles International (LAX), John Wayne/Orange County, Long Beach, Ontario International, and Burbank (herein referred to as the RASP Study Area).

4.1 DEMAND FINDINGS

A regional econometric demand model (“the Model”) was developed for the RASP in order to capture and assess the regional demographics and air travel demand characteristics of the RASP Study Area. In later phases of the study, the Model was used as a decision support tool to evaluate various “what-if” scenarios and quantitatively measure the impact of infrastructure enhancements and/or policy measures on the regional aviation system. The Model basically “computes” the propensity for people to travel and the factors that lead to a choice of airport, which primarily includes the time and costs associated with accessing aviation services. SANDAG’s Regional Travel Demand Model was also incorporated into the RASP Model to estimate ground transportation changes and access times. A detailed description of the RASP Model development and output is provided in Appendix B.

The following sections summarize the key air travel demand findings of the RASP Study Area.

4.1.1 Historic Growth in Regional Aviation Demand

Notwithstanding economic recessions and industry-wide passenger reductions, San Diego has experienced above average growth compared to the greater Los Angeles metropolitan region, Mexico, and the United States as a whole. Historical annual passenger demand for the RASP Study Area is presented on Figure 4-1.
As presented on Figure 4-2, the real GDP and per capita income in San Diego are growing at 4.2% and 4.3% compound annual rates, respectively, compared to 3.5% and 3.3% in the greater Los Angeles metropolitan region. Enplanements in the San Diego region have also substantially outpaced the U.S. average, at 3.0% compound annual growth rate compared to 1.7%. As presented in Figure 4-3, this strong growth in enplanements can be attributable to the steady growth in per capita income and population in San Diego. Since 1990, per capita income and population have grown by 200% and 20% by 2009 respectively.

Except for LAX, aviation growth in the RASP Study Area is significantly influenced by the business model of low cost carriers, which dominate the majority of airports in the region, including Tijuana Rodriguez International and many of the airports in greater Los Angeles metropolitan area. As shown on Figure 4-4, based on 2008 data, low cost carriers – primarily Southwest Airlines and JetBlue Airways – represented the largest share of the market at San Diego International, Ontario, Burbank, and Long Beach airports. Volaris, a Mexican low cost carrier, represented 50% of the market at Tijuana Rodriguez International.
Figure 4-2
KEY ECONOMIC DATA COMPOUND ANNUAL GROWTH RATE (1998-2007)
Regional Aviation Strategic Plan

<table>
<thead>
<tr>
<th>Data Type</th>
<th>San Diego Metropolitan Statistical Area (MSA)</th>
<th>Los Angeles Combined Statistical Area (MSA)</th>
<th>U.S. Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population</td>
<td>0.9%</td>
<td>1.1%</td>
<td>1.0%</td>
</tr>
<tr>
<td>Real GDP</td>
<td>4.2%</td>
<td>3.5%</td>
<td>2.7%</td>
</tr>
<tr>
<td>Per Capita Income</td>
<td>4.3%</td>
<td>3.3%</td>
<td>4.2%</td>
</tr>
<tr>
<td>Enplanements</td>
<td>1.4%</td>
<td>3.0%</td>
<td>1.7%</td>
</tr>
</tbody>
</table>

Sources: Bureau of Economic Analysis, Interactive Tables for Regional Economic Accounts; U.S. DOT T100 Database; September 2009.

Figure 4-3
INDEXED GROWTH IN SAN DIEGO METROPOLITAN STATISTICAL AREA (INDEXED TO 1990)
Regional Aviation Strategic Plan

Notes: Real GDP compound annual growth rate (CAGR) is for 2001-2006; San Diego Metropolitan Statistical Area (MSA) aligns with San Diego County boundaries.

Sources: Jacobs Consultancy, based on San Diego County Regional Aviation Strategic Plan, Aviation Demand Forecasts, Landrum & Brown, Inc., December 2008; FAA Terminal Area Forecast; Bureau of Economic Analysis, Interactive Tables for Regional Economic Accounts; September 2009.
4.1.2 Air Service Background

The following summarizes air service findings for the three dominant commercial service airports in the RASP Study Area – San Diego International, Los Angeles International, and Tijuana Rodriguez International.

4.1.2.1 San Diego International Airport

As presented on Figure 4-5, ten destinations account for more than 40% of San Diego International’s outbound traffic. Moreover, four of the top ten destinations are located in California: San Francisco, Sacramento, Oakland, and San Jose.

Similar to the region, Southwest Airlines has driven the majority of passenger growth at San Diego International since 1990. As shown on Figure 4-6, the compound annual growth rate (CAGR) of Southwest Airlines between 1990 and 2008 was 7.2%, compared to 1.4% for all other carriers operating at San Diego International. In addition, Southwest’s market share increased during this same period from 18% to 38%, while all other carriers cumulatively decreased their market share from 82% to 62%.
Figure 4-5

**TOP 100 DESTINATIONS FROM SAN DIEGO INTERNATIONAL AIRPORT**
Regional Aviation Strategic Plan

![Bar chart showing the top 100 destinations from San Diego International Airport. The chart highlights that 62% of passengers are served with direct flights, and 38% are served with connecting flights.](chart.png)

Note: Based on 2008 annual enplanements.
Source: Jacobs Consultancy, based on U.S. DOT Airline Origin and Destination Survey (DB1B), September 2009.

Figure 4-6

**HISTORICAL AIRLINE MARKET SHARE AT SAN DIEGO INTERNATIONAL AIRPORT**
Regional Aviation Strategic Plan

![Bar chart showing historical airline market share at San Diego International Airport. The chart highlights Southwest Airlines with a CAGR of 7.2% and Other Airlines with a CAGR of 1.4%.](chart.png)

Note: CAGR = Compound Annual Growth Rate
Source: Jacobs Consultancy, based on OAG T100 Database, September 2009.
Southwest Airlines competes vigorously with other airlines at San Diego International. Southwest’s growth at San Diego International has primarily been achieved by adding new routes versus adding capacity to existing routes. As presented on Figure 4-7, the seat capacity of Southwest at San Diego International grew from 1.5 to 5.0 million between 1990 and 2008, with 67% of that capacity provided on new routes. Alternatively, the seat capacity of all other carriers at San Diego International decreased from 7.4 to 6.9 million during the same period, with the other air carriers significantly reducing seat capacity to the Los Angeles market.

The strong growth of Southwest Airlines at San Diego International has facilitated the increase in affordable air service for San Diego residents and visitors. As one of nation’s top leisure destinations, San Diego County has benefited immensely from this effect. On the other hand, Southwest Airlines’ strong presence has discouraged carriers at San Diego International from adding services to international destinations because Southwest Airlines provides leisure domestic alternatives to international destinations. This has contributed to an increase in San Diego County residents and visitors choosing airports outside of San Diego County for international travel.

4.1.2.2 Los Angeles International Airport

Compared to San Diego International, LAX offers non-stop service to 50 more domestic and 53 more international destinations than San Diego International. With regard to Mexican destinations, in 2009, LAX offered non-stop service to 15 Mexican
destinations with 31 non-stop flights per day. As a result, many San Diego County residents and visitors choose to connect at LAX based on the frequency of service or the number of destinations offered at that airport.

As shown on Figure 4-8, of the total San Diego County passengers connecting at LAX, approximately 41% (about 250,000 annual passengers) originate their travel at San Diego International, while approximately 54% (about 350,000 annual passengers) connect at LAX using ground transportation (e.g., train, car, bus, etc) to access the facility. Approximately 5% of LAX connecting passengers originate their travel at McClellan-Palomar, which currently only offers commercial service to LAX.

4.1.2.3 Tijuana Rodriguez International Airport

When traveling to Mexican destinations, many San Diego County residents choose to use Tijuana Rodriguez International. Compared to San Diego International which only offered service to one Mexican destination in 2009, Tijuana Rodriguez International offered nonstop service to 21 Mexican destinations with 50 non-stop flights per day. In 2009 Tijuana Rodriguez International initiated non-stop service to Tokyo.

As shown on Figure 4-9, approximately 780,000 San Diego County residents traveled to Mexican destinations in 2006. Of this total, approximately 78,000 passengers originated their travel at San Diego International, representing 10% of the total departure bookings; approximately 46,800 passengers originated their travel at LAX;
approximately 7,800 passengers originated their travel at John Wayne/Orange County or Ontario airports. However, a total of 647,000 (or 83%) originated their travel at Tijuana Rodriguez International after crossing the U.S. - Mexico border.

For U.S. citizens crossing the border, significant ground access time is associated with using Tijuana Rodriguez International. Figure 4-10, shows the distribution of border crossings at San Ysidro, Tecate, and Otay Mesa, while Figure 4-11 summarizes the border crossing times associated with each. Notably, the time required to cross into Mexico from the U.S. is negligible at approximately 5 minutes for each crossing. However, the time required for vehicles to re-enter the U.S. is substantial, with the average varying from 15 minutes at Tecate to 55 minutes at Otay Mesa.
4.1.3 Aviation Industry Trends and Outlooks

The following summarizes RASP-applicable trends and generalized outlooks for the commercial airline, general aviation, and air cargo industries.

4.1.3.1 Commercial Airline Industry

Demand for air travel in the U.S. correlates strongly with fluctuations in the U.S. economy. The long-term trend in commercial airline activity is presented on
Figure 4-12. As presented, recessionary periods dating back to the 1970s and other external “shocks”, such as the Arab Oil Embargo, Gulf Wars, and terrorist attacks, caused periodic downturns in aviation growth. However, as demonstrated on Figure 4-12, after each downturn, commercial airline demand has recovered quickly.

In the post-financial crisis environment, carriers have reduced capacity around 15% in an effort to maintain high fares and revenues. Notwithstanding these cuts, the industry was projected to lose billions of dollars in 2009. While 2009 third quarter financials improved, passenger growth and yields remain weak, and a recovery in demand was projected to be modest relative to prior recoveries.

4.1.3.2 General Aviation Activity

All industry forecasts predict declines in recreational general aviation and piston-type aircraft activity but increases in turbojet and helicopter activity associated with corporate aviation. Most corporate general aviation demand is associated with downtown San Diego, with San Diego International representing the ideal geographic location for this type of activity based on proximity and access to the corporate demand base.
As commercial passenger traffic increases and San Diego International becomes more congested, it is expected that increasing numbers of general aviation aircraft will be accommodated at other system airports. The system is well-equipped to accommodate all types of general aviation demand; therefore, it is assumed that there is sufficient overall capacity to accommodate demand over the planning horizon.

4.1.3.3 Air Cargo Activity

Approximately 90% of cargo handled at San Diego International is accommodated on integrated/express carriers and originates in or is destined for central San Diego. Similar to general aviation activity, San Diego International is the ideal geographic location for this type of activity based on its close proximity to the demand base. Moreover, integrated carriers employ vast distribution networks requiring a centralized airport location, with San Diego International again representing the ideal ground transportation base.

It should be noted that no system airport north of San Diego International can accommodate air cargo type aircraft; air cargo carriers are unwilling to operate from facilities south of San Diego International since such locations would increase delivery times to the primary demand base in central San Diego.

4.2 PREVIOUS ESTIMATES OF REGIONAL AVIATION CAPACITY

Numerous studies prepared in the past five years have documented that San Diego County will run out of commercial aviation capacity during the RASP planning horizon. A summary of key capacity findings from previous studies is provided in Table 4-1. Previous studies assumed passengers will still be able to access air service if and when San Diego International reaches capacity; however, the number of passengers or potential demand “lost” to San Diego International has not been quantified to date.

This “lost” demand or “suppressed demand” is defined as potential passengers who desire to travel via air service, but do not due to lack of available capacity and/or prohibitively high costs. Figure 4-13 presents the concept of suppressed demand at San Diego International. As shown, when passenger demand nears the capacity of the airport’s airfield, growth in demand will subside due to increasing airfares and operational delays. Eventually, growth in demand will cease and stabilize (or remain flat) at the maximum level that can be accommodated by the airfield’s capacity. Potential demand that cannot be accommodated – the difference between unconstrained and constrained demand – is defined as suppressed demand.
Table 4-1
SAN DIEGO INTERNATIONAL AIRPORT CAPACITY FINDINGS FROM PREVIOUS STUDIES
Regional Aviation Strategic Plan

<table>
<thead>
<tr>
<th>Study</th>
<th>Year</th>
<th>Key capacity findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Destination Lindbergh</td>
<td>2008</td>
<td>SAN’s airfield will reach capacity between 2020 and 2025 likely resulting in airline market responses, including schedule changes and up-gauging to larger aircraft.</td>
</tr>
<tr>
<td>SAN PLAN: Southern California Airport Capacity</td>
<td>2008</td>
<td>LAX will reach its policy constrained limit of 78 million annual passengers as early as 2015. Orange County and Long Beach have reached legal constraints. Burbank may reach its capacity as early as 2025. SAN could experience severe congestion by 2020.</td>
</tr>
<tr>
<td>FAA: Capacity Needs in the National Airspace System</td>
<td>2007</td>
<td>SAN and the San Diego metropolitan area will need additional aviation capacity by 2025. NextGen improvements, planned Authority improvements, and multi-modal planning will be required.</td>
</tr>
<tr>
<td>San Diego International Airport Aviation Activity Forecasts</td>
<td>2004</td>
<td>SAN runway capacity will constrain growth between 2015 - 2022. SAN runway congestion will not allow further growth between 2021 - 2030. Without new investments, SAN may experience a cumulative loss of between 5 – 30M passengers over the forecast period.</td>
</tr>
</tbody>
</table>

4.3 BASELINE SCENARIO

The following summarizes the Baseline Scenario developed for the RASP. The Baseline Scenario is the “do-nothing” scenario with which all other alternatives were compared. The Baseline Scenario is primarily defined by the expected outcome of the capacity constraint at San Diego International. The Baseline Scenario incorporates (1) reasonably foreseeable “market-driven” reactions to address demand once San Diego International reaches capacity; (2) “approved” and funded improvements in the near-term horizon; and (3) capacity constraints at the greater Los Angeles metropolitan region airports. The Baseline Scenario does not include construction of major new facilities, policy options not currently in place, or artificial constraints on demand.

4.3.1 Facility and Policy Assumptions

The Baseline Scenario includes the following Authority policies and planned near-term improvements:

- Accommodation of existing user groups at San Diego International, including commercial passenger and air cargo service and corporate general aviation.
• Continued nighttime departure curfew from 11:30 p.m. to 6:30 a.m.

• Implementation of the Terminal 2 West 10 gate addition in 2013 (ongoing project)

• Destination Lindbergh “Opening Day” recommendations for the Airport’s north side, including: (1) an Intermodal Transit Center (ITC) sized to accommodate 400-600 thousand annual transit passengers; (2) SANDAG’s transit ridership goal for 2015 of 6% of airport passengers, corresponding to the linkage to trolleys (Blue and Orange lines), COASTER, Amtrak, and the San Diego Metropolitan Transit System (MTS); (3) consolidated rental car facility and ground transportation plaza; and (4) dedicated on-airport roadway connecting the ITC and south side terminals via dedicated buses

The Baseline Scenario assumes that no new access roadway improvements or freeway ramps will be provided to facilitate access to San Diego International. However, the Scenario does include region-wide surface improvements per SANDAG’s 2007 RTP – “Revenue Constrained Scenario”. These improvements in 2010, 2020, and 2030 are depicted on Figures 4-14 through 4-16.
4.3.2 Cost Estimates and Implementation Timeline

Table 4-2 presents the cost estimates associated with the Baseline Scenario. The total cost to build facilities associated with the Baseline Scenario is approximately $535 million, with multiple agencies responsible for funding and implementing the various projects; not all are the responsibility of the Authority. Surface improvements per SANDAG’s RTP “Revenue Constrained Scenario” are not included in the cost estimates; and costs associated with the Terminal 2 West Expansion are not included since the project is already funded.

<table>
<thead>
<tr>
<th>Component</th>
<th>Cost Estimate</th>
<th>Potential Funding Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Property Acquisition</td>
<td>$11 M</td>
<td>PFC/Bonds</td>
</tr>
<tr>
<td>Rail Improvements</td>
<td>$ 50 M</td>
<td>SANDAG/Bonds</td>
</tr>
<tr>
<td>Intermodal Transportation Center</td>
<td>$ 39 M</td>
<td>PFC/Bonds</td>
</tr>
<tr>
<td>Dedicated Roadway</td>
<td>$ 50 M</td>
<td>Bonds</td>
</tr>
<tr>
<td>Consolidated Rental Car Facility</td>
<td>$300 M</td>
<td>CFC</td>
</tr>
<tr>
<td>Auto Parking</td>
<td>$ 85 M</td>
<td>Private/Bonds</td>
</tr>
</tbody>
</table>

**TOTAL $535 M**

Notes: Various agencies are responsible for funding and implementing the above projects; not all are responsibility of the Authority. All cost from Destination Lindbergh include soft costs and contingency. Costs associated with Terminal 2 West Expansion are not included as the project is ongoing.

Source: Jacobsendaniels Associates, LLC., August 2010.

The implementation timeline associated with the Baseline Scenario is presented on Figure 4-17. As presented, the implementation of the various projects is estimated to take approximately ten years, and is assumed to begin around 2015.
4.3.3 Market Reactions

As presented on Figure 4-18, capacity constraints at San Diego International will result in multiple “market reactions” over the long-term. It is widely recognized that San Diego International will reach its airfield capacity sometime between 2020 and 2030 at approximately 28 million annual passengers. Once this occurs, the airport’s level of service is expected to decrease, resulting in increased operating delays (on the airfield and in the ground transportation network leading to the airport); and the price of air service will increase steeply. These consequences will result in the following:

- Accommodation of some San Diego demand at greater Los Angeles metropolitan region airports as well as Tijuana Rodriguez International, including increased bus service and volumes on the surface roadways
- Increased but limited commercial service at McClellan-Palomar via continued turboprop service (<30 seats) due to the airport’s constrained runway length
- The potential for Federally-mandated slot controls at San Diego International
• Some limited up-gauging of commercial service aircraft at San Diego International and some international wide-body flights due to LAX capacity constraints and increasing drive times to the greater Los Angeles metropolitan region.
4.3.4 Baseline Findings

Figure 4-19 presents projected passenger enplanements for the RASP Study Area, which includes San Diego, Tijuana, and five airports in the greater Los Angeles metropolitan region. As presented, annual enplaned passengers are projected to increase 50% between 2009 and 2030 from 48 to 80 million. Passenger demand is projected to recover following the current economic recession at a compound annual growth rate of 5.4% (2010 – 2015); the overall 20-year compound annual growth rate (2010 – 2020) is projected to be 2.4%. For San Diego International, passenger enplanements during the “recovery” period are projected to grow at a compound annual growth rate of 4.7%; while the airport’s overall 20-year compound annual growth rate is projected to be 2.5%. As presented, Tijuana Rodriguez International is expected to experience the largest increase in passenger enplanements, increasing from 1.6 to 5.6 million enplanements between 2010 and 2030 at a compound annual growth rate of 6.4%.

The RASP demand model predicts that many Southern California airports will reach capacity during the RASP forecast period. As presented on Figure 4-20, LAX is projected to reach capacity sometime around 2015, which will result in significant increases in passenger enplanements at John Wayne/Orange County, Long Beach,
Ontario International, and Burbank. Furthermore, each of these airports is projected to reach its respective capacity between 2015 and 2020.

Historical and projected passenger enplanements in the Baseline Scenario for San Diego International are presented on Figure 4-21. As presented, the demand model indicates capacity constraints at San Diego International will begin between 2020 and 2025. The effect of this capacity constraint will be diminished levels of service, increased operating delays, and higher fares for air service. The demand model projects San Diego International will reach its airfield capacity earlier than previously forecasted (see Section 4.2), which is a result of model projections that incorporate numerous econometric variables and capacity constraints at RASP Study Area airports.

As presented on Figure 4-22, the econometric model predicts that San Diego County residents and visitors will increasingly use airports outside San Diego County beginning around 2020 as San Diego International nears capacity. McClellan-Palomar will attract additional passenger demand around 2025 (see Figure 4-19).
Figure 4-21

BASELINE SCENARIO — PROJECTED SAN DIEGO INTERNATIONAL ENPLANEMENTS

Regional Aviation Strategic Plan

SAN Capacity

Note: Model calibrated to actual enplanements from 2006 to 2009; projections may be different from actual.
RASP Model Projection - Jacobs Consultancy, August 2010.

Figure 4-22

BASELINE SCENARIO — PROJECTED SAN DIEGO RESIDENT AND VISITOR ENPLANEMENTS DISTRIBUTION AT RASP STUDY AREA AIRPORTS

Regional Aviation Strategic Plan

Historical | Projected

Sources:
SAN Capacity

Note: Model calibrated to actual enplanements from 2006 to 2009; projections may be different from actual.
RASP Model Projection - Jacobs Consultancy, August 2010.
Tijuana Rodriguez International is projected to continue to experience strong growth driven by domestic Mexican traffic, and will continue to be the largest gateway for U.S.-Mexico traffic in the region.

As demand eventually nears overall regional aviation capacity, the number of “suppressed passengers” in San Diego County is also projected to increase. Therefore, suppressed demand is a key metric in comparing performance of various RASP scenarios. Figure 4-23 presents suppressed aviation passenger demand for San Diego County. As presented, suppressed passenger demand in the Baseline Scenario is projected to increase to about 3.0 million annual enplaned passengers by 2030.

Figure 4-23

BASELINE SCENARIO — SAN DIEGO COUNTY SUPPRESSED AVIATION PASSENGER DEMAND

Regional Aviation Strategic Plan

Note: Suppressed demand presented above is relative to 2006; it is acknowledged that some suppressed demand already exists.