MINETA-SAN JOSE INTERNATIONAL AIRPORT

AIRPORT MASTER PLAN
DEMAND FORECAST UPDATE

HNTB Corporation
June 2, 2017

Table of Contents

Page

APPENDICES

List of Figures

List of Tables

List of Appendix Tables

1 Introduction

The Norman Y. Mineta San Jose International Airport (SJC) is undertaking a master plan demand forecast update in support of the Runway Incursion Mitigation (RIM)/Design Standards Analysis Study. This technical report describes the approach, assumptions, and results associated with the aviation activity forecast, which was focused on developing the projections required to identify SJC's future airfield, terminal and landside facility requirements.

The elements of this forecast include passenger originations and enplanements, passenger aircraft operations, aircraft fleet mix, design day flight schedules, and peak activity projections. Forecasts of air cargo tonnage, and air cargo, general aviation, and military operations are also included. The forecasts are unconstrained, meaning that they are based on the assumption that there will be sufficient airfield, terminal, and landside facilities to accommodate all aviation activity dictated by SJC market demand over the forecast period. The forecasts include the base year (2016), 2022, 2027, 2032, and 2037. The forecasts were carried forward sufficiently to determine the year in which the 17.6 Million Annual Passenger (MAP) level was anticipated to be met. The 17.6 MAP level represents the approved SJC development level from the 1997 Master Plan and associated Environmental Impact Review (EIR).

This report is organized into ten sections:

Section 1, this introduction,

Section 2, which discusses the main drivers of aviation activity, including historical and anticipated socioeconomic activity in the San Jose region,

Section 3, which describes historical aviation activity and ongoing trends at SJC,

Section 4, which presents critical assumptions to the forecast,

Section 5, the domestic and international passenger forecast,

Section 6, the domestic and international passenger aircraft operations and fleet mix forecasts,

Section 7, the forecast of air cargo activity,

Section 8, the forecasts of general aviation and military activity

Section 9, the landed weight forecast,

Section 10, the peak activity forecast, and

Section 11, which includes a summary and a comparison with the FAA's Terminal Area Forecast (TAF).

The assumptions used in the following forecasts are based on input from Airport staff, previous SJC and Bay Area studies, relevant literature, and professional experience. Forecasting, however, is not an exact science. Variations in the projections of key inputs such as the local and national economy and in the airline business environment may have a significant effect on the projections presented herein. These uncertainties increase towards the end of the forecast period, when new technologies and business strategies and changes in work and recreational practices may have an unpredictable impact on aviation

activity. For these reasons, the forecasts should be periodically compared with actual Airport activity levels, and Airport plans and policies adjusted accordingly.

2 Economic Trends

Passenger demand is determined by the strength of the economy and the cost and availability of air service. Consequently, the development of an aviation activity forecast requires a clear understanding of local economic forecasts and trends. This section discusses the estimate of SJC's Air Trade Area and the key economic trends within the area.

2.1 Definition of Air Trade Area

The SJC Air Trade Area definition used in the previous Master Plan includes Santa Clara, Alameda, Monterey, San Benito, San Mateo, and Santa Cruz Counties. It is recognized that SJC serves some originating passengers from outside these counties and that other airports, such as San Francisco International (SFO) and Oakland International (OAK) serve passengers from within the SJC Air Trade Area. Other Air Trade Area definitions were tested, including Santa Clara County by itself, and a greater Bay Area definition that added Contra Costa, Marin, Napa, San Francisco, Solano, and Sonoma Counties to the originally defined Air Trade Area. However, an analysis undertaken as part of this study indicated that the original six-county definition was more strongly correlated statistically with domestic passenger originations than the other Air Trade Area definitions and was therefore used in this forecast.

2.2 Demographic and Economic Growth

This section details the rationale for developing a combined total regional income forecast that builds upon the strengths of the alternative available socioeconomic projections, for use in the SJC forecast.

Economic projections by the Association of Bay Area Governments (ABAG), the California Department of Finance, and the Complete Economic and Demographic Data Source (CEDDS) forecasts published by Woods and Poole (W&P)[1] were considered. Each source has its strengths and weaknesses which are noted in this section.

The ABAG projections are periodically prepared for the nine ABAG counties (Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, and Sonoma). They include detailed forecasts of population, employment, and households and are prepared by experts with in-depth local knowledge. However, the most recent forecasts (*Projections 2013*) are now three years old and do not include income projections. In addition, they do not include three of the counties in the SJC Air Trade Area (Monterey, San Benito, and Santa Cruz).

The California Department of Finance Demographic Research Unit (DRU) population forecasts were most recently updated in 2014 and are prepared for each county in California. Where possible, the projections

[1] W&P is a private economic forecasting firm that has been preparing socioeconomic forecasts at the county, metropolitan, state, and national level for over thirty years. Their forecasts have been regularly used as inputs to many aviation activity forecasts at airports across the country.

include input from county planning agencies and Councils of Government. Although all the counties in the SJC Air Trade Area are included, the forecasts do not include projections of employment or income.

The W&P forecasts include employment and personal income in addition to population, and they prepare county, metropolitan, state, and national forecasts using a common set of assumptions. However, the W&P forecasts do not incorporate a detailed knowledge of local growth trends and development constraints.

The ABAG forecasts are less recent than the other two alternatives and do not include three of the counties in the SJC Air Trade Area; they consequently were excluded from further consideration. The California DRU forecasts are prepared in-state and reflect a more detailed knowledge of the existing and projected growth trends within the SJC Air Trade Area than the W&P forecasts. Therefore, the California DRU population forecasts are recommended for use in this study.

The California DRU forecasts do not include projections of regional income. Regional income is important because analyses of historical passenger originations at SJC and elsewhere has indicated that originations are more closely correlated with income than with population or employment.[2] Therefore, a combined total regional income forecast that incorporates the strengths and minimizes the weaknesses of the California DRU and W&P data sources, as listed above, was prepared for use in this study. In the combined forecast, per capita income (income per person) projections by W&P were multiplied by DRU population forecasts to generate combined total personal income forecasts for each county. A final adjustment was made to match all the forecasts to the most recent common base year – 2015 – for which personal income data was available. The combined income forecast is recommended for use in this study.

Figure 1 presents historical and projected population in the SJC Air Trade Area. Population grew at an average 0.9 percent per year from 1990 to 2015. There was steady growth until the "dot.com bust" in 2001, after which population declined through 2004 and then began growing again. The recommended DRU forecast and W&P forecast are similar through 2037. The DRU forecast projects an average annual growth rate of 0.8 percent and the W&P forecast projects an annual average growth rate of 0.7 percent.

[2] In addition, regional income is more closely related to SJC passenger demand than national income. Please see Section 5 for more detail.

FIGURE 1: Historical and Projected Population: SJC Air Trade Area

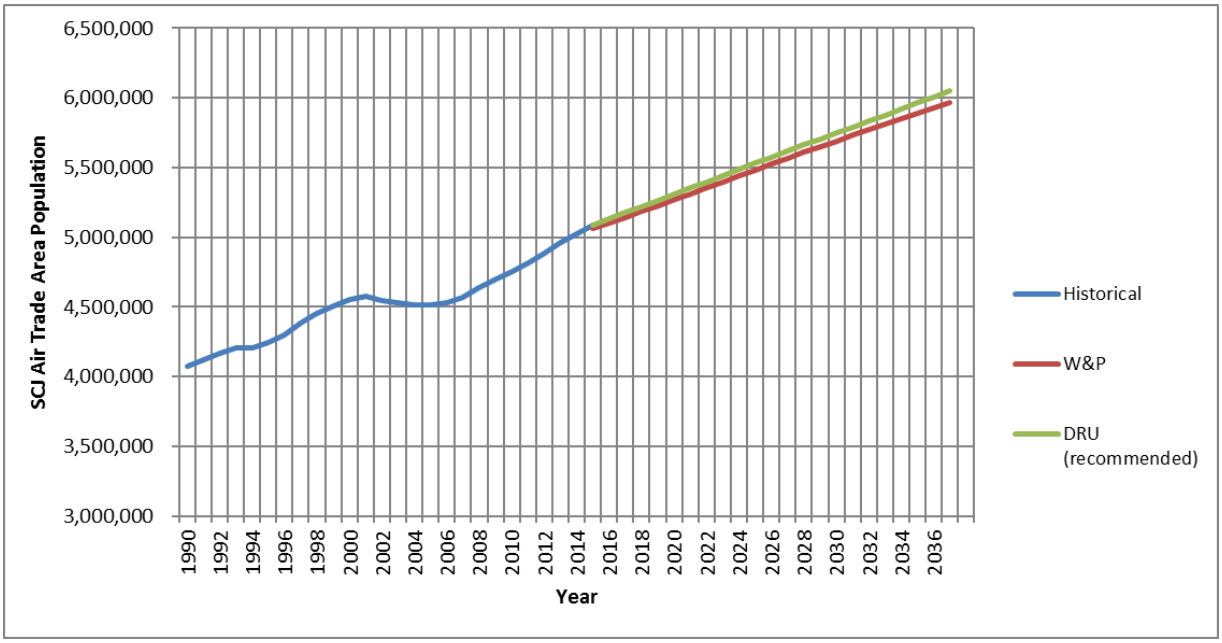


Figure 2 presents historical and projected employment in the SJC Air Trade Area. Employment trends have followed business cycles, with dips in the recession of the early 1990s, the post dot.com recession in 2001, and the Great Recession of 2008-2009. Average employment growth from 1990 to 2015 has been 1.1 percent per year. W&P projects employment to grow at a 1.3 percent annual rate through 2037.

FIGURE 2: Historical and Projected Employment: SJC Air Trade Area

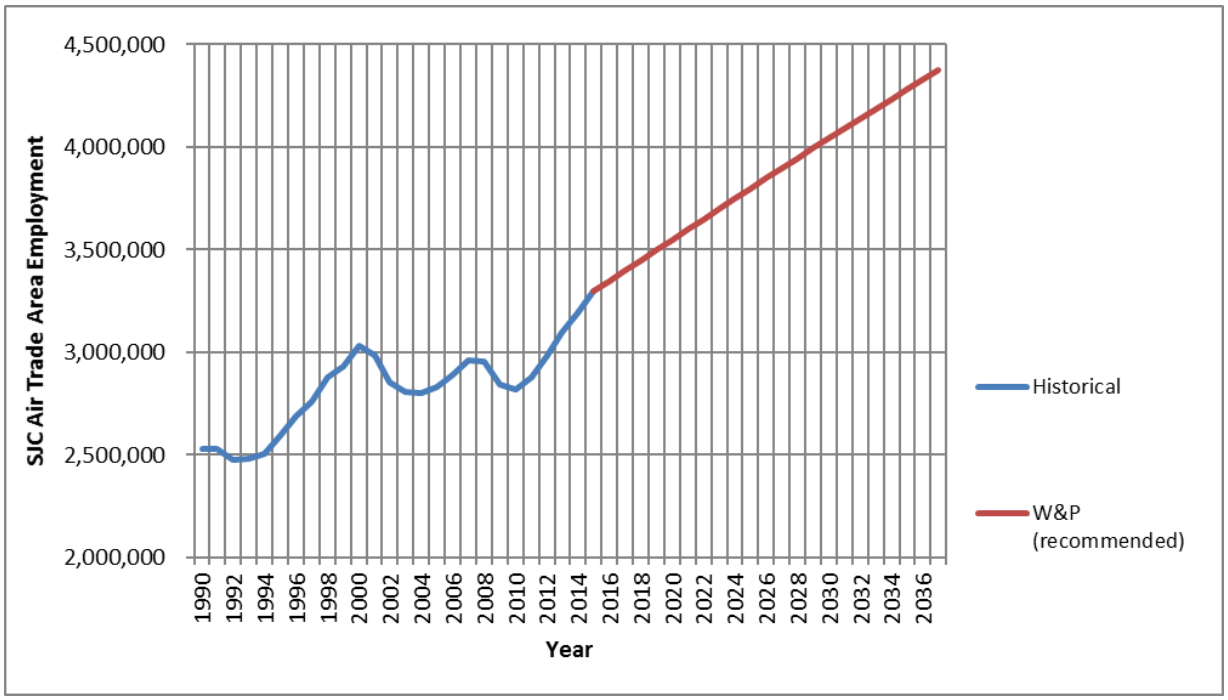


Figure 3 presents historical and projected per capita income (income per person measured in 2015 dollars to adjust for inflation) in the SJC trade area. Like employment, per capita income trends have followed business cycles. There was a very steep increase in the late 1990s, during the dot.com boom. On average, per capita income grew at 2.5 percent per year from 1990 through 2015. According to W&P, per capita income will grow at a more moderate rate of 1.3 percent per year through 2037.

FIGURE 3: Historical and Projected Per Capita Income: SJC Air Trade Area

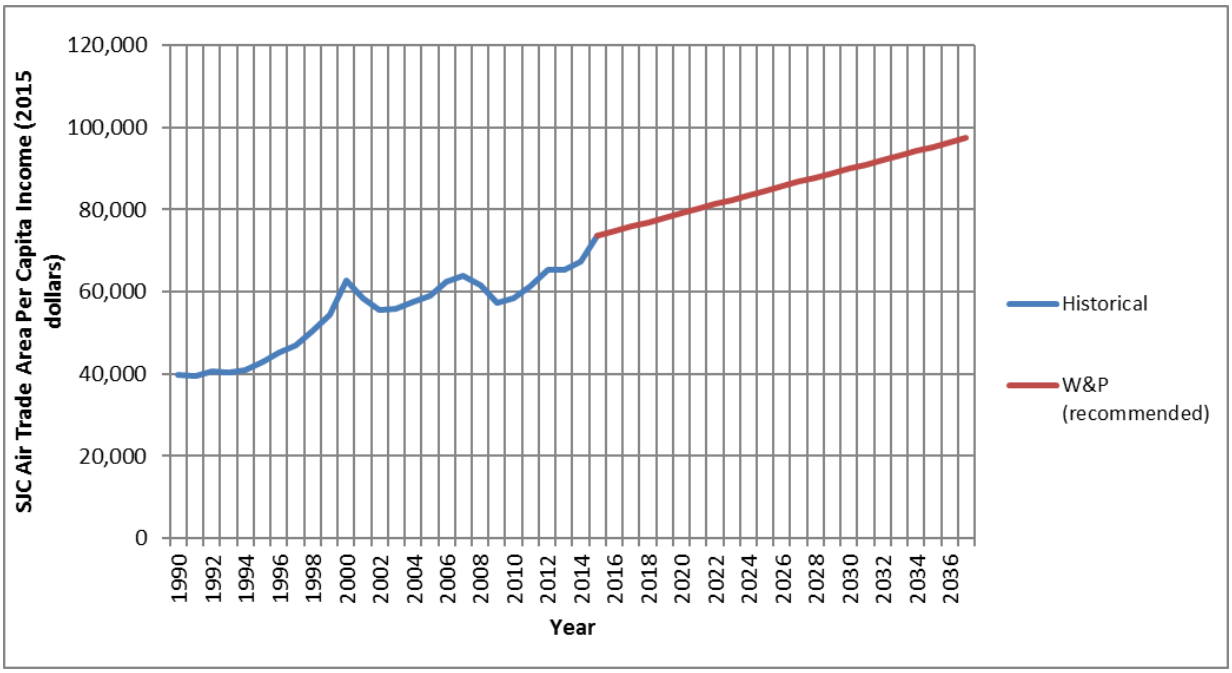


Figure 4 presents historical and projected total personal income in the SJC Air Trade Area. Like the employment and per capita income numbers, historical income has followed the ups and downs of the business cycle. Between 1990 and 2015, total income grew at an average rate of 3.4 percent per year. Under both the recommended hybrid forecast and the W&P forecast, total income is projected to grow at a 2.1 percent annual rate through 2037.

Table 1 summarizes the recent historical data and the selected socioeconomic forecasts for the SJC Air Trade Area that are used in this master plan demand forecast. **Appendix A** provide additional socioeconomic historical data and projections.

The socioeconomic forecasts assume no major economic downturn, such as occurred during the depression of the 1930s or the recent Great Recession. The SJC Air Trade and national economies will periodically increase and decrease the pace of growth in accordance with business cycles. However, it is assumed that, over the forecast term, the high-growth and low-growth periods will generally offset each other so that the adjusted economic forecasts described in **Figures 1** through **4** and **Table 1** will be realized over the course of the 20-year forecast horizon just as has occurred historically between 1990 and 2015.

FIGURE 4: Historic and Projected Total Personal Income: SJC Air Trade Area

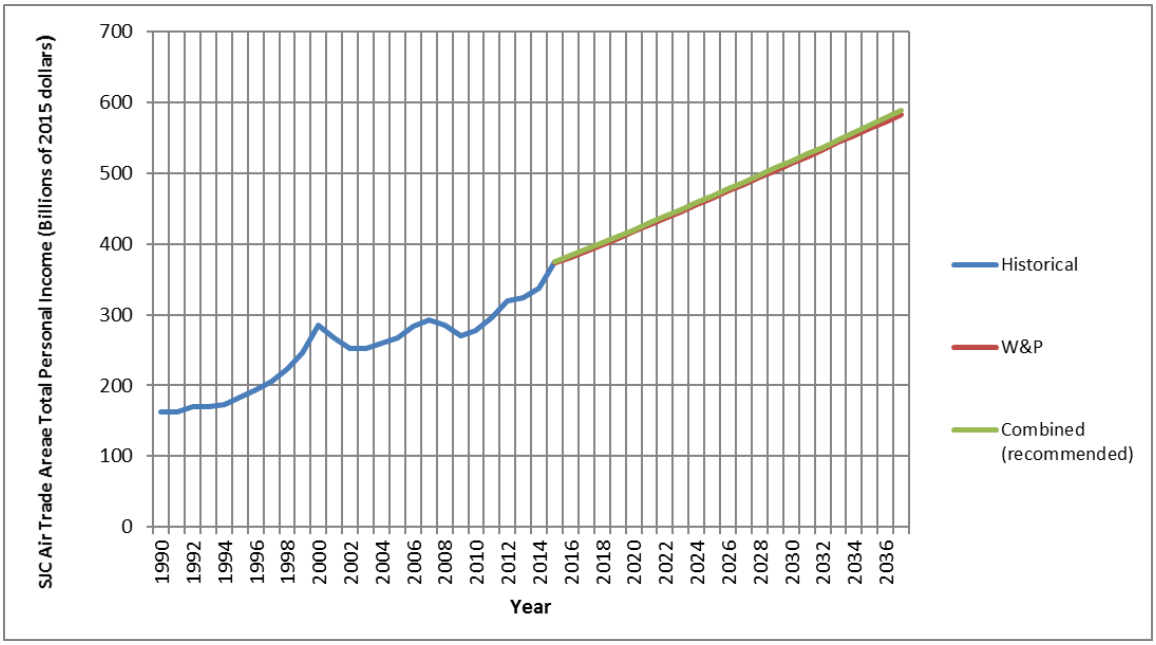


Table 1 - San Jose Air Trade Area: Economic Projections [1]				
Year	**Population**	**Employment**	**Income[2]**	**PCI[3]**
		Historical		
2010	4,755,615	2,816,190	$277,923,810	$58,441
2011	4,818,538	2,875,488	$295,106,395	$61,244
2012	4,887,999	2,984,636	$319,504,735	$65,365
2013	4,960,983	3,093,874	$323,553,704	$65,220
2014	5,025,522	3,193,916	$338,069,972	$67,271
2015	5,088,230	3,296,389	$374,626,565	$73,626
		Projected		
2016	5,132,258	3,348,199	$383,479,602	$74,719
2022	5,399,296	3,648,285	$438,803,023	$81,270
2027	5,621,076	3,896,454	$487,778,834	$86,777
2032	5,835,615	4,139,941	$537,010,821	$92,023
2037	6,048,323	4,377,727	$589,013,404	$97,385
		Compounded Annual Growth Rate		
2015-2037	0.8%	1.3%	2.1%	1.3%

[1] San Jose Air Trade Area includes Santa Clara, Alameda, Monterey, San Benito, San Mateo, and Santa Cruz Counties.

[2] 000's of 2015 dollars.

[3] Per Capita Income (in 2015 dollars).

Sources: Tables A.1 through A.8 in Appendix A and HNTB analysis.

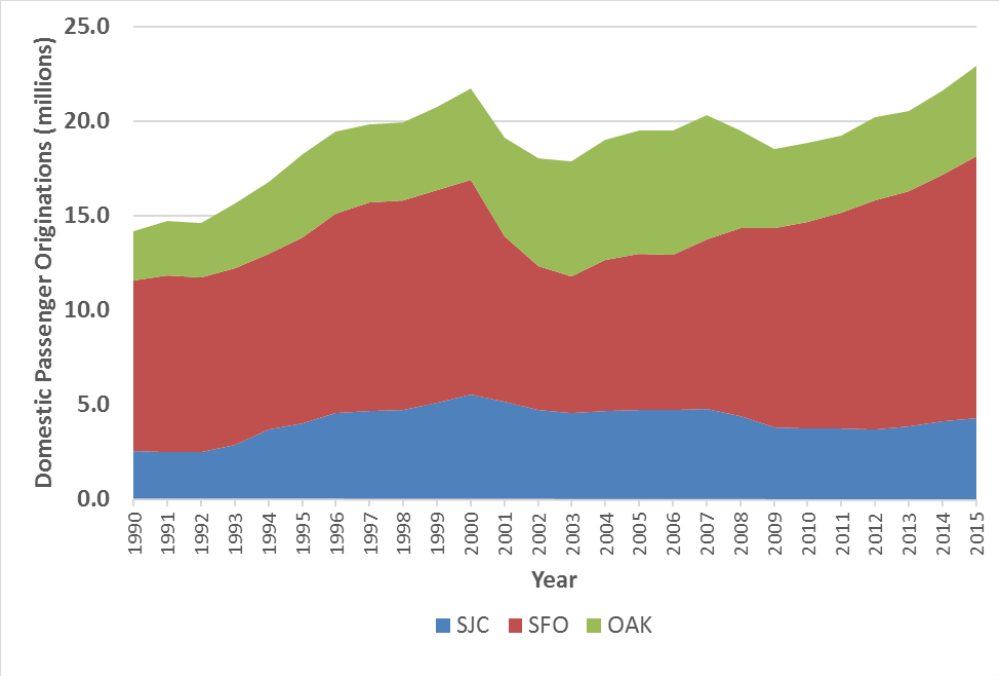
3 Historical Airport Activity

Historical trends in passenger originations and enplanements, and in aircraft operations at SJC are discussed in this section.

3.1 Passenger Originations

Passenger origination levels at SJC have varied with the 9/11 attacks, economic growth, fuel prices and air fares, as well as air service strategies at the three commercial Bay Area airports. Total Bay Area traffic grew rapidly in the 1990s along with the dot.com boom and significant increases in low-cost carrier service at SJC and OAK by airlines such as Southwest. This was followed by a sharp decline in 2001-2003 because of the dot.com bust and the September 11, 2001 terrorist attacks. SJC traffic experienced a further setback in 2008-2010 because of the financial crisis and new service by Virgin America at SFO which attracted passengers from SJC. Since 2014, passenger originations and enplanements have begun to recover, and this recovery has continued well into 2016. SJC's share of Bay Area domestic originations reached a peak of 27 percent in 2001, but has since declined to 19.2 percent in 2016. **Figure 5** presents SJC historical domestic originations as a share of total Bay Area traffic and **Appendix C** provides more detailed historical data on originations.

FIGURE 5: Historical Domestic Passenger Originations at SJC, SFO, and OAK



3.2 Passenger Enplanements

Table 2 presents the recent history of passenger enplanements at SJC. Passenger enplanements include both originating and connecting passengers with originating passengers making up approximately 96 percent of total enplanements at SJC.

Table 2 - Historical Passenger Enplanements at SJC			
	Enplanements		
Year	Domestic	International	Total
2004	5,231,717	116,231	5,347,948
2005	5,266,297	102,499	5,368,796
2006	5,231,695	114,787	5,346,482
2007	5,246,192	74,540	5,320,732
2008	4,780,211	65,997	4,846,208
2009	4,093,065	56,238	4,149,303
2010	4,050,541	69,995	4,120,536
2011	4,091,713	84,141	4,175,854
2012	4,056,392	86,533	4,142,925
2013	4,228,649	148,406	4,377,055
2014	4,515,331	164,513	4,679,844
2015	4,686,803	198,887	4,885,690
2016	5,042,720	334,713	5,377,433
Compounded Annual Growth Rate			
2004-2016	-0.3%	9.2%	0.0%
2010-2015	3.7%	29.8%	4.5%

Sources: Table C.6 in Appendix C and HNTB analysis.

At SJC, passenger enplanements have tracked very closely with passenger originations over the past twenty years. Currently, SJC has fewer international enplanements than international originations since many SJC international originating passengers connect through other gateways and are therefore counted as domestic enplanements. For example, a passenger going from SJC to Paris via Chicago O'Hare International Airport (ORD), would count as a domestic enplanement but an international origination based on U.S. DOT definitions, since the ultimate destination is international. Currently, there is a surge in international enplanements at SJC facilitated by the introduction of new generation aircraft, such as the Boeing 787, that are well suited to mid-sized markets such as SJC. Appendix C provides additional detail on historical passenger enplanements at SJC.

3.3 Aircraft Operations

Table 3 presents SJC counts of historical aircraft operations at the Airport. Each aircraft take-off and each aircraft landing counts as an operation. Overflights are not included in the Table 3 counts, but touch-and-go operations are counted with each pass as both an arrival and departure.

The peaks and valleys of air carrier operations activity at SJC have roughly followed passenger enplanement trends over the past twenty-five years. The overall growth rate has been less, however, as airlines have increasingly been able to reduce flight frequencies by accommodating passengers with larger aircraft and higher load factors. For example, passenger enplanements have increased at a 4.5 percent annual rate since 2010, whereas passenger aircraft operations (passenger carrier and taxi/commuter) increased by 1.3 percent annually over the same period. Commuter operations have been gradually declining since 2007, as 50-seat regional jets have been increasingly replaced by larger 70 plus seat jets.

Table 3 - Historical Aircraft Operations at SJC							
Year	Passenger Carrier	Taxi/ Commuter	Cargo	GA Itinerant	GA Local	Military	Total
2002	121,334	15,132	5,103	53,973	11,863	105	207,510
2003	105,578	26,472	3,834	49,578	12,488	132	198,082
2004	102,728	30,328	3,610	46,628	14,895	125	198,314
2005	96,564	30,406	3,528	46,303	17,098	76	193,975
2006	97,198	29,832	3,452	40,921	16,962	97	188,462
2007	97,702	30,452	3,242	40,127	15,666	78	187,267
2008	93,270	25,096	2,884	35,599	15,654	73	172,576
2009	80,232	22,542	2,364	26,566	13,776	358	145,838
2010	73,586	16,956	1,984	26,335	4,356	273	123,490
2011	73,094	15,592	1,932	25,022	5,072	254	120,966
2012	70,562	15,752	1,540	25,686	5,638	251	119,429
2013	73,476	16,524	1,434	27,029	4,257	227	122,947
2014	73,430	18,174	1,546	26,255	4,541	192	124,138
2015	74,594	18,662	1,542	29,587	4,400	236	129,021
2016	101,790	1,490	1,616	29,380	4,363	276	138,915
Compounded Annual Growth Rate							
2002-2016	-1.2%	-15.3%	-7.9%	-4.3%	-6.9%	7.1%	-2.8%

Source: San Jose International Airport.

General aviation (GA) operations decreased substantially between 1992 and 2011, as many smaller piston-powered aircraft owners and operators either retired or relocated to other airports. Since 2011, GA operations have gradually increased, driven mostly by increased business travel on GA jets and turboprops and the recent increased availability of corporate hangar space. Military operations are a small component of SJC activity, and fluctuate from year to year.

Total aircraft operations are currently less than half the level experienced in the early 1990s, largely as a result of the decline in GA activity, but since 2012 they have begun to increase again with 2016 reporting a total of 138,915 operations. Appendix C contains additional detail on historical aircraft operations at SJC.

4 Forecast Assumptions

This section describes the key assumptions used to develop the aviation activity forecasts. Unless otherwise noted, any mention of FAA projections or forecasts refers to the *FAA Aerospace Forecast: Fiscal Years 2016-2036*[3]. The major assumptions are described below.

[3] FAA Aerospace Forecast: Fiscal Years 2016-2036, March 2016, https://www.faa.gov/data_research/aviation/

4.1 Unconstrained Forecasts

The SJC activity forecasts are physically unconstrained. For the purposes of this forecast study, "physically unconstrained" means that there will be sufficient airfield, airspace, terminal, and landside capacity at SJC to accommodate all aviation activity dictated by demand over the forecast period. The ability of the airport to accommodate unconstrained demand will be evaluated as part of the Runway Incursion Mitigation/Design Standards Analysis Study capacity and facility requirements analysis that is currently underway.

It is assumed that destination airports will be developed sufficiently to accommodate demand from the San Jose area, however, it is recognized that airfield capacity constraints at some airports, such as London Heathrow and Tokyo Narita, may force increases in aircraft gauge that would not occur in a truly unconstrained scenario.

4.2 Economic Growth

Forecasts for population, employment, and income in the SJC Air Trade Area are presented in Table 1 and Figures 1 through 4 and are provided in more detail in Appendix C. As noted in Section 2, the forecasts assume no major economic downturn will occur in the forecast period, such as the ones that occurred during the depression of the 1930s or the recent 2008-2009 Great Recession. However, it is understood that the pace of growth in the local and national economies will periodically increase or decrease in accordance with business cycles. Over the forecast term, it is assumed that the high-growth and low-growth periods will offset each other so that the adjusted economic forecasts described Section 2 will be realized.

4.3 Air Fares and Yield

In their annual Aerospace Forecast, the FAA includes projections of airline yield (revenue per passenger mile). Coupled with their projections of average trip distance, these projections were used to estimate future air fares (see **Appendix B** for additional detail). The FAA yield projections reflect a variety of factors, including labor costs, degree of competition, efficiencies from newer and larger aircraft, and fuel prices. Changes in jet fuel prices over the past decades have had a major impact on the aviation industry. The future price outlook is uncertain, and is subject to factors such as fracking, viability of the continued expansion of oil sands and oil producing shale resources, Middle East politics, biofuel development, and economic growth in the rest of the world. The FAA yield forecasts assume a gradual increase in real fuel prices over the next ten years until they reach levels like those occurring between 2011 and 2014, after which they are projected to remain constant in real dollars. It is assumed that, except for 2016 and 2017 as noted in **Appendix B**, SJC air fares will change at the same rate as FAA air fares.

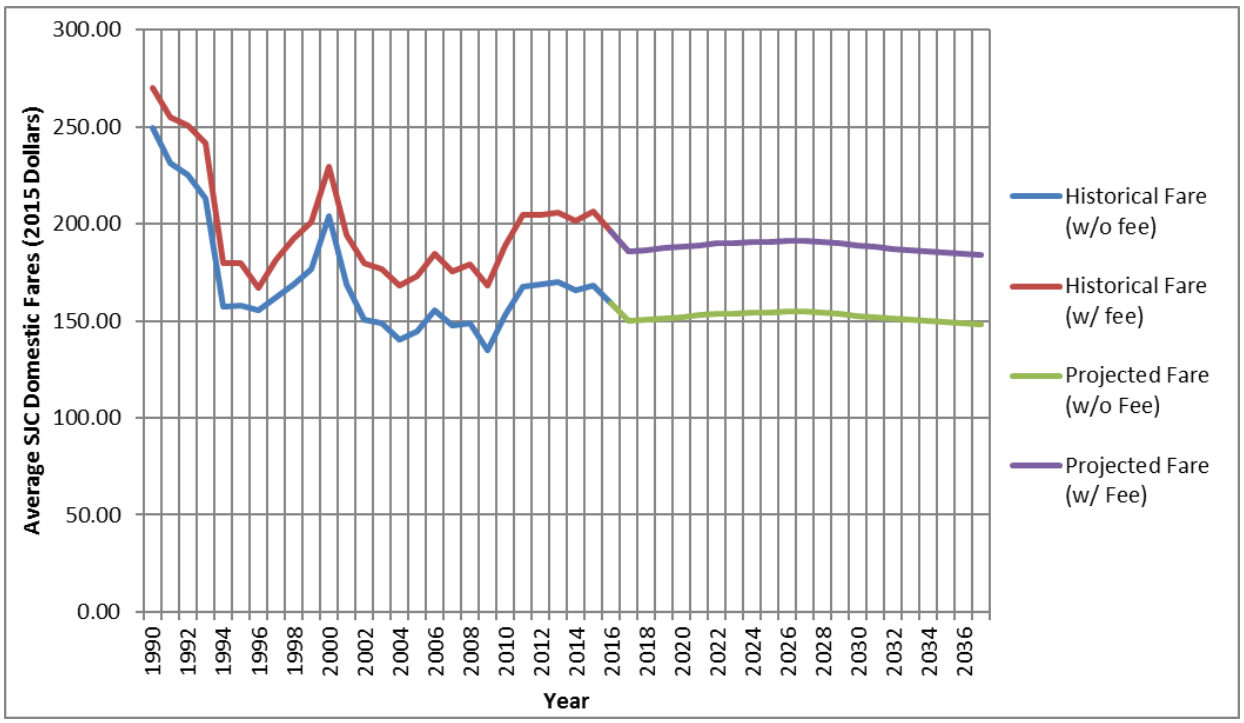
4.4 Taxes and Fees

In addition to the base fare, a passenger's cost of air travel includes airline taxes, passenger facility charges (PFCs), security fees, and airline ancillary fees. The following assumptions were applied for each of these taxes and fees:

- Airline excise tax – continues at 7.5 percent of base fare.
- Airline segment tax – increases with rate of inflation
- Security fee – increases from $5.60 per trip at rate of inflation
- PFCs – increase at rate of inflation
- Ancillary fees – Reservation Cancellation Fees and Baggage Fees currently average 5.4 percent of passenger ticket revenues for domestic U.S. carriers. This percentage is assumed to remain constant through the forecast period.

Figure 6 presents real (adjusted for inflation) historical and projected air fares at SJC, with and without taxes and fees.

FIGURE 6: SJC Historical and Projected Fares and Fees



4.5 Load Factor

In accordance with FAA projections, average scheduled domestic load factor is assumed to increase from 76.0 percent in 2016 to 77.3 percent by 2037 and average scheduled international load factor is assumed to change from 77.1 percent to 77.0 percent over the same period.

4.6 Fleet Mix

Fleet mix estimates were based on industry trends, along with published aircraft orders and retirement plans. Key assumptions include:

- Replacement of a significant number of 50-seat RJs by larger commuter aircraft and small narrow-body aircraft at reduced frequencies.
- A moderate increase in large (65 to 90 seat) regional jets and turboprops.
- Replacement of most 757 aircraft with Boeing 737-900ER and Airbus A321 aircraft. It is possible that an aircraft manufacturer may develop a new model 757 replacement, but at this point there is insufficient information to include it in the fleet mix.
- Retirement of MD-80, MD-90, and 717 aircraft over the forecast period, to be replaced by Airbus 319 and Boeing 737-700 aircraft and Bombardier C-series.
- Replacement of many 737-700, -800, and -900 aircraft by their 737 MAX equivalents.
- Replacement of many A319, A320, and A321 classic aircraft with their Airbus NEO equivalents.
- The Boeing 787 is expected to remain a significant long-haul international aircraft at SJC, with some operations by Boeing 777 and Airbus A330/350 aircraft.
- Gradual replacement of Airbus A-300 and A-310 aircraft in cargo service with Boeing 757 and 767 aircraft.

Aircraft retirement assumptions are based on the age of relevant aircraft types in each airline fleet when no published information on aircraft retirements is available.

4.7 Gating Assumptions

The following gating assumptions pertain to the preparation of the design day flight schedules:

- Buffer time of 15 minutes between a departure and subsequent arrival at a gate for short and medium haul domestic and pre-cleared international flights.
- Buffer time of 30 minutes between a departure and subsequent arrival at a gate for other international flights and transcontinental domestic flights.
- Minimum turnaround times based on each airline's existing practice at SJC.
- Minimum gate dwell time of 30 minutes for regional and low-cost carrier aircraft, and 45 minutes for legacy carrier mainline aircraft for flights that are towed on or off a gate.

4.8 Constraints at SFO and OAK

The Regional Airport System Plan Update – Baseline Runway Capacity and Delays Report, prepared by Flight Transportation Associates for the Regional Airport Planning Committee in August 2010, estimates an annual airfield capacity of 460,000 to 485,000 operations for SFO. Therefore, a midpoint between these two values was chosen to represent the maximum capacity of 472,500 aircraft operations assumed for SFO. It was also assumed that SFO will be able to continue to expand terminal and landside capacity to remain in balance with maximum airfield capacity.

The Regional Airport System Plan Update also estimates an OAK airfield capacity of 400,000 annual operations. However, the capacity analysis includes North Field runways which are limited to non-

commercial operations, except in very rare instances. Therefore, the capacity available to scheduled passenger operations operating off the single air carrier capable runway is less. A similar study, the *Ultimate Airfield Capacity Study: Oakland International Airport*, indicated that at maximum daily activity levels, 750 of the 1,130 maximum operations (67 percent) could be performed by passenger aircraft. This suggests a maximum airfield capacity of 265,000 annual commercial operations at OAK. Based on this estimate, the 265,000 annual operations level was recommended to represent OAK airfield capacity for commercial operations. It was assumed that OAK will be able to expand terminal and landside capacity to remain in balance with airfield capacity.

4.9 Regulatory Assumptions

No return to airline regulation, as occurred prior to 1979, was assumed. This means that airlines will be assumed to increase service and change fares as market conditions dictate. SJC noise restrictions, with their current provisions, are assumed to continue throughout the forecast period.

4.10 Future Security Environment

Security issues related to air travel have changed and will continue to change as new threats, security procedures and technology are incorporated to improve airport security. Events that may affect traveler confidence in airport security or air travel security cannot be reasonably predicted. It was assumed that there will be no terrorist attacks during the forecast period that will affect confidence in the aviation system to the same extent as 9/11. It was also assumed that the Transportation Security Administration (TSA) and associated security costs, after adjustment for inflation, and requirements will continue through the forecast period.

4.11 International Political Environment

No major international conflicts that would disrupt aviation at SJC were assumed. Likewise, no major trade wars or embargoes that would restrict the flow of commerce and passenger travel were assumed.

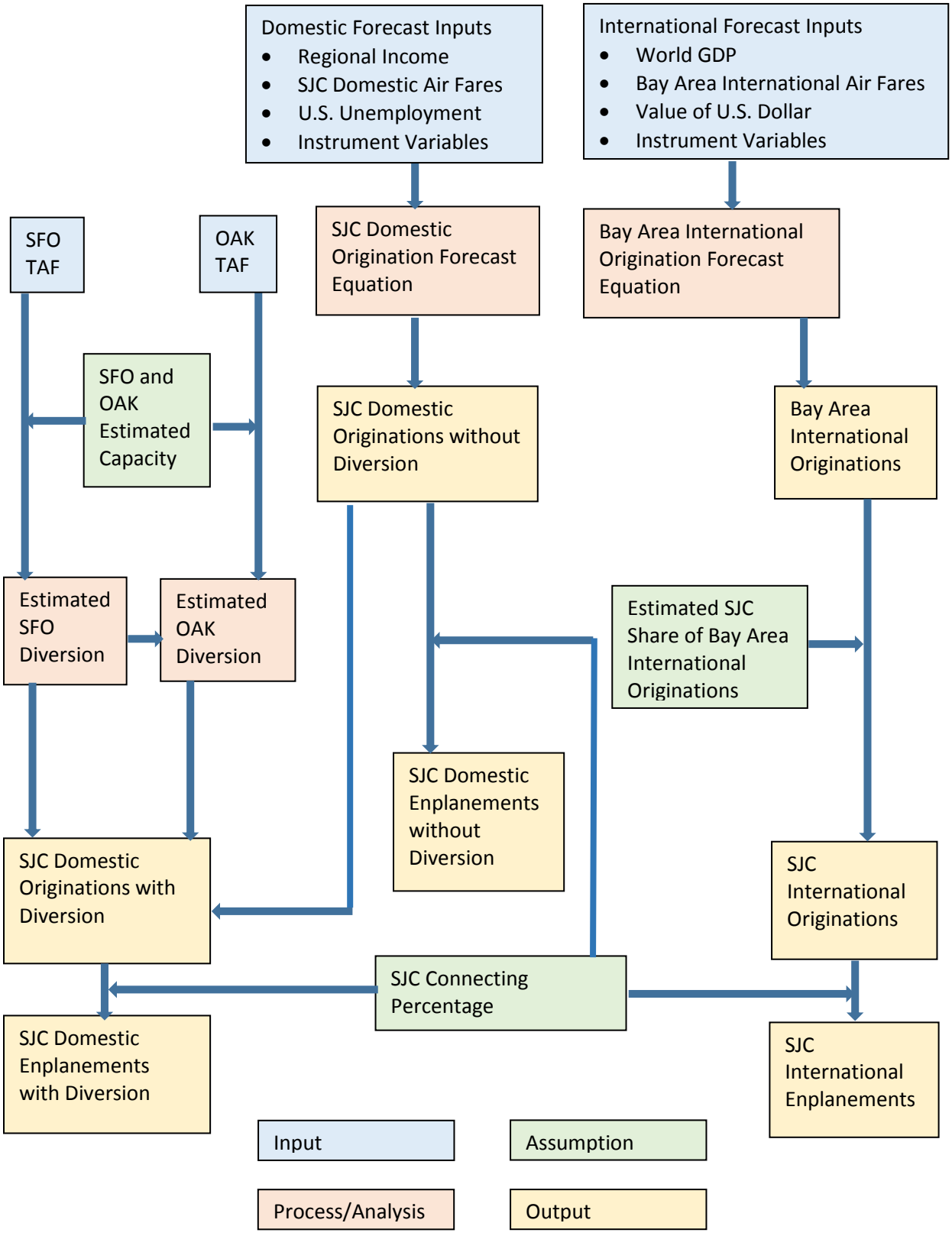
4.12 Environmental Factors

No major changes in the physical environment are assumed. It was assumed that global climate changes will not be sufficient to force restrictions on the burning of hydrocarbons or major fuel tax increases within the forecast period. It is also assumed that practical alternatives to 100LL Avgas, which is leaded, will become available for the GA piston fleet before 100LL fuel is phased out.

5 Passenger Forecasts

This section summarizes the development of the domestic and international passenger origination and enplanement forecasts. The passenger forecasts were developed for 2022, 2027, 2032, and 2037. The forecasts were developed in two stages; the first stage does not include diversion from SFO and OAK, whereas the second stage includes diversion from the other Bay Area airports due to potential future capacity constraints at those two facilities. The forecast from the second stage is carried forward as the recommended forecast for the remainder of the analysis. **Figure** 7 provides a schematic summary of the approach which is explained in more detail later in this section and in **Appendices D** and **E**.

FIGURE 7: SJC Passenger Forecast Approach



5.1 Domestic Passenger Originations Forecast without Diversion from SFO and OAK

Regression analysis was used to forecast SJC domestic passenger originations prior to diversion from SFO and OAK. Regression analysis is a statistical method of generating an equation (or model) which best explains the historical relationship among selected variables, such as originating passengers and real income. If it is assumed that the model that best explains historical activity will continue to hold into the future, this equation can be used as a forecasting equation. Using historical (1990-2014) data, several passenger origination forecasting models were tested including:

- Alternative definitions of the SJC air trade area,
- Alternative independent variables (local income, national income, population, employment, local and national unemployment rates, fares, and yield)
- Instrument variables (sometimes described as dummy variables) representing the impacts of the 9/11 terrorist attacks, the 2003 SARS epidemic, the 2008 financial crisis, and the entry of Virgin America at SFO.[4]
- Linear and logarithmic formulations of the forecasting model.
- Stand-alone forecast vs. share of Bay Area originations

Several of the equations that were calculated showed strong correlations with domestic passenger originations at SJC. The equation that generated the strongest results, from both a theoretical and statistical standpoint, was a stand-alone equation based on the six-county air trade area that includes:

- Income for the six-county SJC Air Trade Area, which represents the ability of residents to pay for air travel. It is also a measure of the economic vitality of the area which attracts non-residential business travelers
- SJC air fares, including taxes and fees, which represents the cost of air travel to SJC passengers
- U.S. unemployment rate, which is a proxy for both economic vitality and consumer confidence (people are more likely to spend the money they have on discretionary services such as air travel if they are confident that they will remain employed)
- Instrument variable representing the 9/11 attacks and subsequent impacts, mainly the increased hassle factor, wait times, and security concerns which have caused passengers to divert to other modes for short-haul travel
- Instrument variable representing the introduction of Virgin America service at SFO, which has attracted passengers to SFO from SJC and OAK

[4] Instrument variables are used to represent factors that cannot be measured or quantified. In the equation, they are represented by a "1" in years when the factor is active and by a "0" when the factor is not active.

The forecast equation and results are detailed in **Table D.1** of **Appendix D**. Based on the forecast, domestic originations (prior to diversion from SFO and OAK) are expected to increase from 4.7 million in 2016 to 7.3 million by 2037, an average annual increase of 2.1 percent.

5.2 International Passenger Originations Forecast

Unlike domestic originations, until recently most international originating passengers from the SJC air trade area have driven to or connected to another international gateway. Therefore, the historical record of international originations at SJC is not likely to be a good guide to future activity and a stand-alone regression equation is unlikely to be effective.

The approach for international originations involved forecasting total Bay Area (SJC+SFO+OAK) international originations, and then estimating the future SJC share of those originations.

The regression equation that generated the strongest statistical results for Bay Area international originations was based on:

- World gross domestic product (GDP) which represents the size of the markets and the ability of passengers to pay for air travel
- Real Bay Area international air fares, which represent the cost of air service to the passenger
- The weighted exchange rate of the dollar, which represents the relative cost of international air travel and destinations when adjusted for exchange rates
- Instrument variable representing the 2008 financial crisis

The equation and results are presented in detail in **Table D.2** of **Appendix D**. Based on the equation, total Bay Area international originations are projected to increase from 6.6 million in 2016 to 15.0 million in 2037, an average annual increase of 4.0 percent.

The SJC share of Bay Area international originations has been increasing because of new international service, and this share is assumed to continue to increase from an estimated 6.7 percent in 2016 to 8 percent over the next twenty years. The 8 percent assumed share of Bay Area international originations is slightly less than SJC's current share of domestic Bay Area originations to the Eastern half of the United States (10 percent). It is also close to SJC's peak share of international Bay Area originations in recent history (7.7 percent in 2000, see **Table C.2** in **Appendix C**). Therefore, 8 percent is considered a reasonable estimate of SJC's potential share of the Bay Area international originating traffic. Based on this assumption, SJC international originations are projected to increase from an estimated 444,000 in 2016 to about 1.2 million by 2037, and average annual increase of 4.8 percent. Much of this increase in Bay Area share is attributable to new international service that has already been announced.

5.3 Passenger Enplanements without Diversion from SFO and OAK

The forecast of domestic and international passenger enplanements was derived from the domestic and international passenger originations forecast using the existing connecting percentage at SJC (4.1 percent based on U.S. DOT data). It was considered unlikely that a carrier would choose to establish a connecting hub operation at SJC since the SJC market is smaller than most successful hubs and is not centrally located with respect to most domestic markets. Therefore, it was assumed that SJC will maintain its role as an origin-destination airport and that there will be no material changes in its passenger connecting percentage.

Table 4 summarizes the forecast of SJC originations and enplanements without diversion from SFO and OAK. The average annual growth rate is projected to be 2.5 percent from 2015 to 2037. Much of the growth, however, is anticipated to occur because of the new service added through 2017. After 2017, the average annual growth rate declines to 2.0 percent per year. The U.S. DOT O&D and T100 databases used in the forecast do not include non-revenue passengers. Therefore, the enplanements in the table do not include non-revenue enplanements and differ slightly from the official Airport records.

Table 4 – Enplanement Forecast (without diversion from SFO and OAK)

	Originations				Revenue Enplanements				
Year	Domestic[1]	International Direct	International Connecting via Other Gateway	International[2]	Total	Domestic[3]	International[4]	Total[5]	Total Enplanements[6]	Total Passengers (Enplaned + Deplaned)[7]
2010	3,730,186	65,002	104,572	169,574	3,899,760	3,985,857	66,096	4,051,953	4,120,536	8,116,871
2011	3,730,725	78,914	103,382	182,296	3,913,021	4,020,075	83,429	4,103,504	4,175,854	8,215,042
2012	3,689,028	81,948	103,821	185,769	3,874,797	3,990,574	84,129	4,074,703	4,142,925	8,166,190
2013	3,852,342	135,296	117,551	252,847	4,105,189	4,162,531	146,091	4,308,622	4,377,055	8,637,162
2014	4,148,264	149,301	131,089	280,390	4,428,654	4,455,301	163,613	4,618,914	4,679,844	9,262,248
2015	4,301,060	178,551	136,172	314,723	4,615,783	4,624,709	192,681	4,817,390	4,885,690	9,799,427
2016	4,674,717	309,390	134,467	443,857	5,118,574	4,975,911	324,269	5,300,179	5,377,433	10,796,725
Forecast										
2022	5,501,877	544,985	171,041	716,027	6,217,903	5,912,542	571,195	6,483,737	6,578,241	13,156,483
2027	5,973,560	655,025	205,577	860,601	6,834,162	6,439,816	686,526	7,126,342	7,230,213	14,460,426
2032	6,619,849	776,134	243,587	1,019,721	7,639,571	7,152,724	813,460	7,966,184	8,082,297	16,164,593
2037	7,278,978	913,103	286,574	1,199,677	8,478,656	7,884,126	957,016	8,841,143	8,970,008	17,940,016
Compounded Annual Growth Rate										
2015-2037	2.4%	7.7%	3.4%	6.3%	2.8%	2.5%	7.6%	2.8%	2.8%	2.8%
2017-2037	1.8%	3.6%	3.6%	3.6%	2.0%	1.8%	3.6%	2.0%	2.0%	2.0%

[1] Table D.1.

[2] Table D.3.

[3] Total enplanements less international enplanements.

[4] 2016 and 2017 estimated based on announced new international service. Ratio of international enplanements to international originations assumed to remain constant after 2017.

[5] Assumes 4.1 percent connecting percentage throughout forecast period.

[6] Includes non-revenue enplanements. Ratio of total enplanements to revenue enplanements assumed to remain constant in future.

[7] Future deplanements assumed to be the same as enplanements.

Sources: As noted and HNTB analysis.

5.4 Forecast of Diversion from Other Bay Area Airports

As noted in Section 4, SFO and OAK are anticipated to eventually reach the limits of their airfield capacity. The maximum capacity at SFO is estimated to be 472,500 annual operations and the maximum capacity at OAK is estimated to be 265,000 annual commercial operations. Estimated SFO and OAK airfield constraints were incorporated in the SJC forecast because, due to environmental, financial, and political factors, it would be extremely difficult for these two airports to add new runways. Because of the overlap in air service areas, it is therefore likely that SJC will be affected once SFO and OAK reach capacity. The details of the diversion analysis are provided in **Appendix E**.

Based on current activity levels and growth rates it appears that SFO will reach its maximum operating capacity much sooner than OAK. The most current 2016 FAA Terminal Area Forecast (TAF) for SFO was used to estimate when the airfield capacity constraint will prevent SFO aircraft operations from growing any further. It was also expected that the airport and airlines at SFO will apply various demand management strategies (larger aircraft, higher load factors, etc.) to accommodate passengers once the operations constraint is reached. To reflect these strategies, it was assumed that SFO seats per aircraft and load factor would grow at the FAA national forecast rates, which are more aggressive than the SFO TAF rates. After the SFO operations capacity constraint is reached, and demand management strategies are incorporated, it was assumed that SFO passengers per aircraft would grow at double the national rate and that SFO passenger originations that could still not be accommodated would be diverted to OAK or SJC. This would begin around 2019 once the adjustment for demand management strategies is incorporated.

Analysis of past data indicates that whenever SFO loses any Bay Area passenger market share, approximately 76 percent of the lost traffic goes to OAK and 24 percent goes to SJC. Therefore, it was assumed that 24 percent of the originating passenger traffic that cannot be accommodated by SFO would go to SJC.

Even with overflow traffic from SFO, OAK is not anticipated to exceed commercial airfield capacity until 2035. At that point, it was assumed that all overflow originating passenger traffic would go to SJC.

Only passenger originations were assumed to be diverted to OAK and SJC. Since neither OAK nor SJC has a traditional hub carrier, it was assumed that connecting passengers that could not be accommodated at SFO would be routed through a non-Bay Area airport. When faced with capacity constraints, airlines typically retain the highest revenue traffic, i.e., international. Therefore, no international passengers were assumed to be diverted from SFO and OAK. Also, GA traffic that cannot be accommodated at SFO was assumed to go to a closer GA airport rather than OAK or SJC.

Figure 8 and **Table 5** summarize the SJC passenger forecast including diversions from SFO and OAK. As shown, diversions from SFO are projected to begin in 2019 and diversions from OAK are projected to begin in 2035. Total revenue enplanements are projected to increase from 5.4 million in 2016 to almost 11.3 million in 2037, an average annual increase of 3.6 percent. Total passengers are projected to reach the EIR threshold of 17.6 MAP at around 2031.

FIGURE 8: SJC Scheduled Revenue Enplanement Forecast with Diversions from SFO and OAK

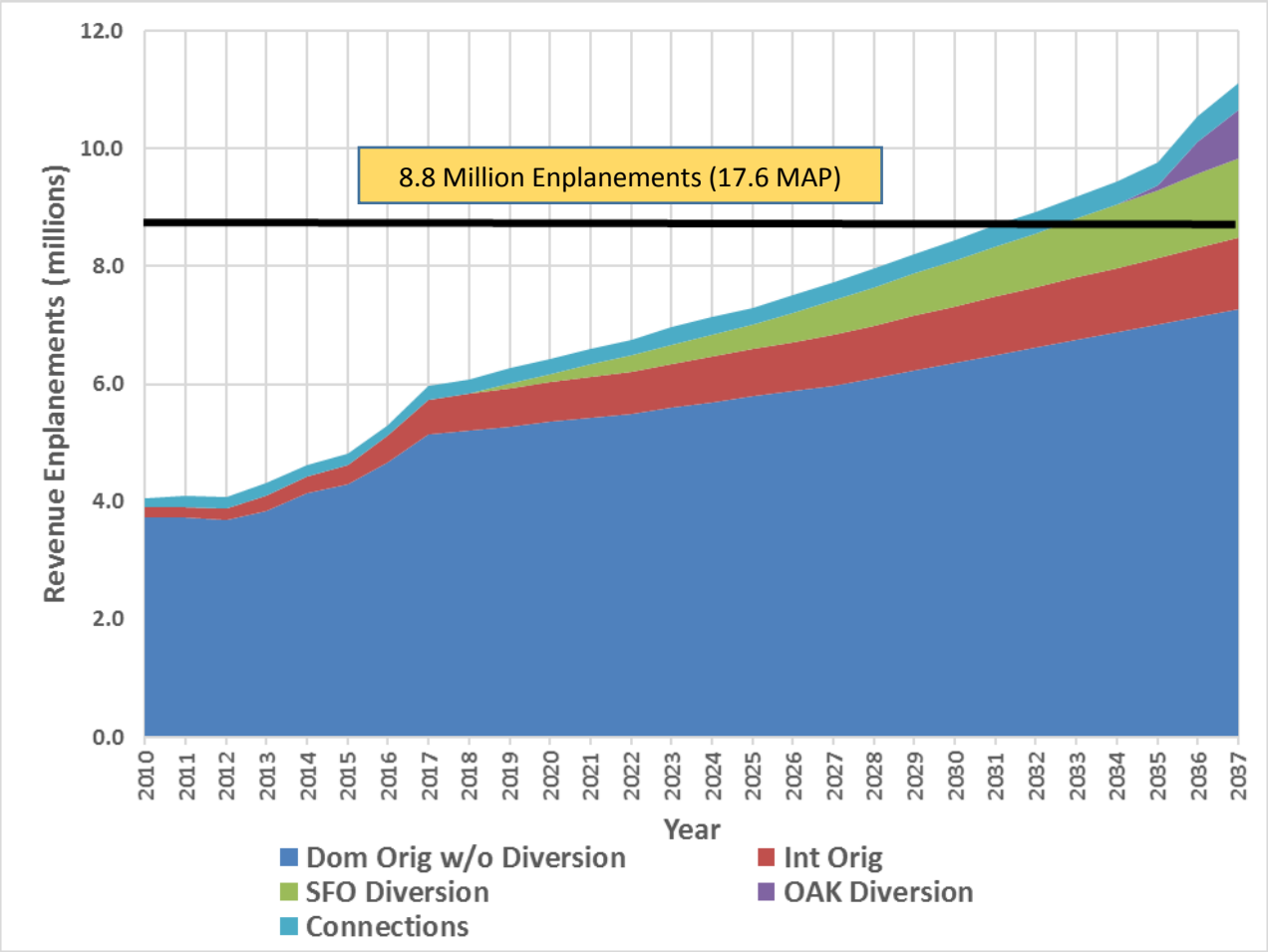


Table 5 – Scheduled Passenger Enplanement Forecast (with diversion from SFO and OAK)

	Originations				Revenue Enplanements					
Year	Domestic	International Direct	International Connecting via Other Gateway	International Subtotal	Total	Domestic	International	Total	Total Enplanements[1]	Total Passengers (Enplaned + Deplaned)
2015	4,301,060	178,551	136,172	314,723	4,615,783	4,624,709	192,681	4,817,390	4,885,690	9,799,427
2016	4,674,717	309,390	134,467	443,857	5,118,574	4,975,911	324,269	5,300,179	5,377,433	10,796,725
Forecast										
2022	5,762,837	544,985	171,041	716,027	6,478,864	6,184,659	571,195	6,755,854	6,854,325	13,708,650
2027	6,557,150	655,025	205,577	860,601	7,417,751	7,048,355	686,526	7,734,881	7,847,623	15,695,246
2032	7,537,455	776,134	243,587	1,019,721	8,557,176	8,109,559	813,460	8,923,019	9,053,079	18,106,158
2037	9,449,237	913,103	286,574	1,199,677	10,648,915	10,147,170	957,016	11,104,186	11,266,037	22,532,074
Compounded Annual Growth Rate										
2016-2037	3.4%	5.3%	3.7%	4.8%	3.6%	3.5%	5.3%	3.6%	3.6%	3.6%

[1] Includes non-revenue enplanements.

Sources: Table 4 and Table E.9 in Appendix E.

6 Forecasts of Passenger Aircraft Departures

This section discusses the forecast of domestic and international aircraft departures at SJC. Aircraft departures were derived from the passenger enplanement forecasts using the following steps:

a) Project domestic and international load factors using FAA growth rates.

b) Project seat departures by dividing the passenger enplanement forecasts by the load factor forecasts.

c) Estimate future SJC nonstop markets.

d) Allocate projected seat departures among existing and future nonstop SJC markets based on existing distributions, historical trends, and known future air service changes.

e) Estimate the most probable way in which airlines would accommodate the seat departure forecasts in terms of aircraft type and frequency of service. The analysis considers current carriers and aircraft serving the route, individual aircraft seat capacity, and aircraft on order by carriers. Annual aircraft frequencies on each route were estimated so that the cumulative seat departures of the aircraft estimated for the market are equal to the required seat departures for that market.

Appendix F provides more detail on the forecast of scheduled passenger aircraft departures.

The market forecasts are used as an input to the design day flight schedule and are also aggregated to generate summary passenger aircraft operations forecasts and fleet mix forecasts.

Table 6 presents SJC's forecast of scheduled domestic and international aircraft departures and operations. The projected average annual growth rate (2.8 percent) is less than the projected growth rate in passenger enplanements (3.6 percent) over the same period. This difference in growth rates reflects both the increase in aircraft size apparent in most airline fleet plans and the capacity constraints at many of SJC's key destination airports (LAX, SAN, SNA, BUR, SEA, and LAS) which will encourage airlines to provide service with larger aircraft rather than more frequencies. Total passenger aircraft operations at SJC are projected to increase from 103,280 in 2016 to 183,920 by 2037.

Table 6 - Forecast of Passenger Aircraft Departures and Operations						
	Passenger Aircraft Departures			Passenger Aircraft Operations		
Year	Domestic	International	Total	Domestic	International	Total
2015	44,986	1,537	46,523	90,182	3,074	93,256
2016	49,124	2,516	51,640	98,249	5,031	103,280
Forecast						
2022	59,252	3,805	63,057	118,504	7,610	126,114
2027	66,467	4,549	71,016	132,934	9,098	142,032
2032	73,203	4,971	78,174	146,406	9,942	156,348
2037	86,152	5,808	91,960	172,304	11,616	183,920
Compounded Annual Growth Rate						
2016-2037	2.7%	4.1%	2.8%	2.7%	4.1%	2.8%

Source: Table F.12 in Appendix F.

7 Forecasts of Air Cargo Activity

This section discusses the forecasts of domestic and international air cargo tonnage and aircraft operations. Air cargo includes both air freight and air mail. Some carriers have ceased distinguishing between air mail and air freight when reporting their statistics. Consequently, the forecast contained herein combines freight and mail into a single air cargo category. All statistics are presented in short tons (2000 pounds per ton). Additional detail is provided in **Appendix G**.

7.1 Domestic Air Cargo

Domestic air cargo tonnage at SJC and the U.S. has been declining over the past ten years. This has been largely the result of structural changes such as the replacement of overnight documents with electronic transmittals and the diversion of many time-definite shipments to truck modes.

There are two main categories of domestic air cargo tonnage at SJC, 1) cargo carried on passenger aircraft (belly cargo) and 2) cargo carried on dedicated all-cargo aircraft. Most domestic air cargo at SJC is shipped on all-cargo express carriers, primarily FedEx and UPS, and approximately 9 percent is shipped as belly cargo on passenger carriers. Belly cargo, both as a share of all cargo and in absolute terms, has been declining at SJC and throughout the U.S. Increased security restrictions and tight turn-around times have made it more difficult for passenger carriers to compete with all-cargo carriers.

Since there has been a material change in the factors driving air cargo demand, a regression equation that assumes a static relationship between air cargo and demand drivers was not considered to be useful for the cargo forecast. For these reasons, a share analysis approach was used to forecast total domestic air cargo tonnage at SJC. SJC's share of U.S. domestic air cargo was calculated and applied to a forecast of future U.S. air cargo air cargo activity, represented by the average of the FAA, Boeing, and Airbus forecasts of U.S. domestic revenue ton miles (RTMs). To account for local economic factors, SJC's future share of domestic air cargo was adjusted by the projected change in the ratio of SJC Air Trade Area income to U.S. income.

The forecasts of SJC domestic belly cargo activity were based on FAA forecasts of RTMs of air cargo traveling on domestic passenger carriers. An index was developed which related the FAA forecast of RTMs on domestic passenger carriers to the forecast of Available Seat Miles (ASM) for domestic air carriers. This ratio provided the expected future relationship of belly cargo to available seats. This index was then applied to the forecasts of domestic scheduled seat departures prepared in Section 6 to produce a domestic belly cargo forecast for SJC.

SJC domestic all-cargo tonnage was projected by subtracting the SJC domestic belly cargo forecast from the SJC total domestic air cargo forecast. This approach to estimating the relative share of belly and all-cargo tonnage follows the approaches used by Boeing and Airbus in their estimates of belly and all-cargo carrier demand.

7.2 International Air Cargo

Currently, virtually all international air cargo at SJC is carried as belly cargo on passenger carriers, almost all on wide-body overseas flights. Most international all-cargo flights go to large gateways or dedicated air cargo airports that provide a critical mass of freight forwarder and Customs broker services. Given the nearby proximity of SFO, which has these services, SJC was not considered to be a likely candidate for regular international all-cargo carrier service.

The forecast of international belly cargo was developed using a methodology like that used for the forecast of domestic belly cargo. An index was developed which related the FAA forecast of RTMs on international passenger carriers to the forecast of ASMs for international air carriers. This index was then applied to the forecasts of international scheduled seat departures prepared in Section 7 to produce an international belly cargo forecast for SJC.

International all-cargo tonnage at SJC was assumed to increase at the same rate as the FAA, Airbus, and Boeing consensus forecast of U.S. international air cargo tonnage.

7.3 Air Cargo Operations

The all-cargo aircraft operations forecast was derived from the domestic and international all-cargo tonnage forecast using historical load factors and the anticipated fleet mix of the cargo carriers serving SJC. **Appendix G** provides more detail on the all-cargo operations and fleet mix forecast.

7.4 Air Cargo Summary

Table 7 summarizes the forecast of all-cargo activity at SJC. Total air cargo tonnage is projected to increase from approximately 55,000 tons in 2015 to about 97,000 tons in 2037, an average annual increase of 2.6 percent. Much of this growth is driven by international belly cargo, which is anticipated to increase substantially as a result of new wide-body lift provided by recently introduced overseas service. Tonnage on all-cargo carriers is expected to grow more moderately (1.3 percent per year). Forecast growth in operations (0.9 percent per year) is slightly lower than the all-cargo tonnage growth, reflecting some up-gauging among the all-cargo carriers.

Table 7 - Summary of Air Cargo Tonnage (Enplaned and Deplaned) (Short Tons) and Operations								
	Tonnage							
Year	Belly Domes-tic	Belly Interna-tional	Belly Sub-total	All-Cargo Domes-tic	All-Cargo Interna-tional	All-Cargo Sub-total	Total	Aircraft Opera-tions
2015	3,885	7,605	11,490	43,846	-	43,846	55,336	1,542
2016	4,195	12,339	16,534	43,797	29	43,826	60,360	1,616
Forecast								
2022	4,704	23,511	28,215	47,578	38	47,616	75,831	1,730
2027	4,754	28,190	32,944	50,473	48	50,520	83,465	1,826
2032	4,701	32,851	37,553	53,807	59	53,865	91,418	1,882
2037	5,052	37,850	42,903	57,179	73	57,252	100,155	1,964
Compounded Annual Growth Rate								
2016-2037	0.9%	5.5%	4.6%	1.3%	4.5%	1.3%	2.4%	0.9%

Sources: Tables G.6 and G.7 in Appendix G.

8 Forecasts of GA and Military Activity

This section discusses the forecasts of general aviation and military activity. Air taxi operations that consist of for-hire flights that do not fly in accordance with a published schedule are included with general aviation.

8.1 General Aviation

General aviation activity has been declining recently at both SJC and throughout the U.S. Some of the decline is attributable to increased aircraft ownership and operating costs. The remainder of the decline is attributable to structural factors, such as increased regulation and reduced interest by younger people in piloting aircraft for personal and recreational purposes. An additional complication is that business-related GA appears to be growing while personal-related GA is declining. Unfortunately, most historical statistics do not differentiate between the two categories. In addition, some of the historical decline in activity at SJC is attributable to airport constraints, such as the lack of available corporate hangar space. Because of these factors, regression analysis is typically not effective in forecasting GA activity.

Since regression analysis was not considered viable, based aircraft were projected as a share of the FAA forecast of the U.S. general aviation fleet. The future share was adjusted to reflect local San Jose economic characteristics by incorporating the different income growth rates anticipated for the SJC air trade area vs. the U. S. In addition, separate based aircraft projections were developed for each major category, including single-engine piston, multi-engine piston, turboprop, jet, and helicopter, to reflect the fact that the SJC based aircraft mix (which includes a large percentage of high-performance turbine-powered aircraft) is substantially different from the national average fleet mix.

Figure 9 presents the forecast of general aviation based aircraft at SJC. Total based aircraft are projected to increase from 137 in 2016 to 164 in 2037, an average annual growth rate of 0.9 percent. As shown in the graph, single-engine piston aircraft are projected to continue to decline through the forecast period,

and most of the growth is driven by high-performance turbine powered aircraft flying mostly for business purposes.

The forecast of general aviation aircraft operations was derived from the forecast of based aircraft. Existing ratios of operations to based aircraft at SJC were calculated for each category (piston, turboprop, jet, helicopter) from the ANOMS and based aircraft data, and then adjusted to reflect FAA forecast changes in utilization (hours flown per aircraft) in each category. These ratios were then used to develop aircraft operations forecasts for each category.

The forecast of SJC general aviation operations is shown in **Figure 10**. Total GA operations are projected to increase at a 2.0 percent annual rate from 33,743 in 2016 to 51,583 in 2037. The growth rate is higher than the based aircraft growth, reflecting higher rates of utilization in the future. The projected distribution by aircraft category is similar to that of based aircraft, with turbine operations increasing, and piston operations decreasing.

FIGURE 9: SJC General Aviation Based Aircraft Forecast

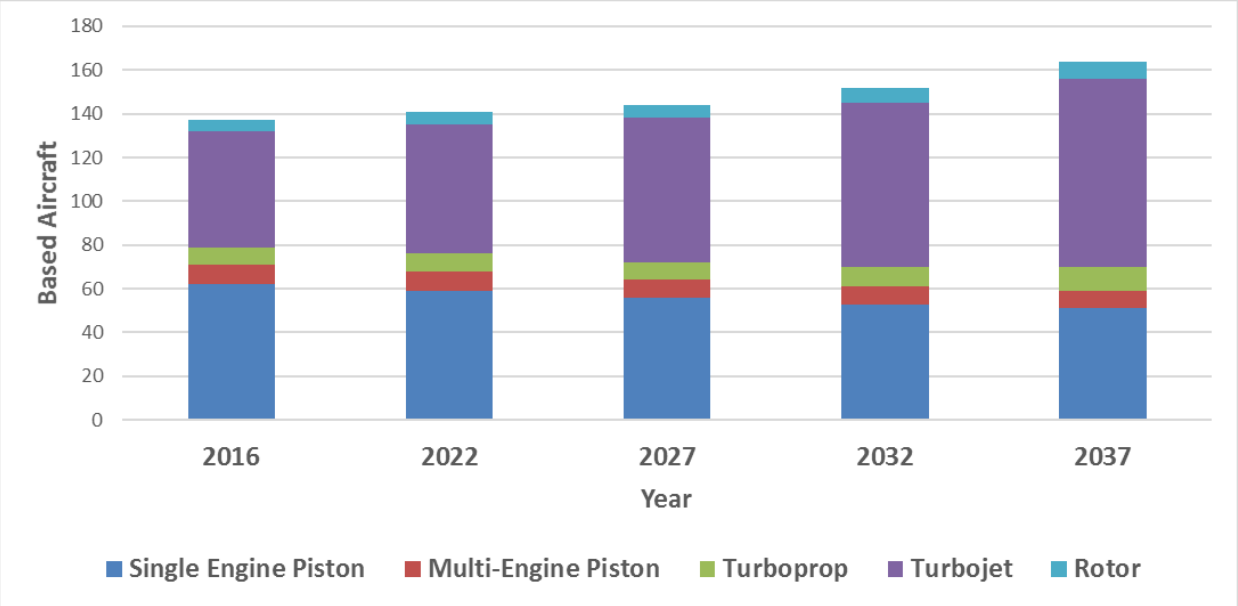


FIGURE 10: SJC General Aviation Aircraft Operations Forecast

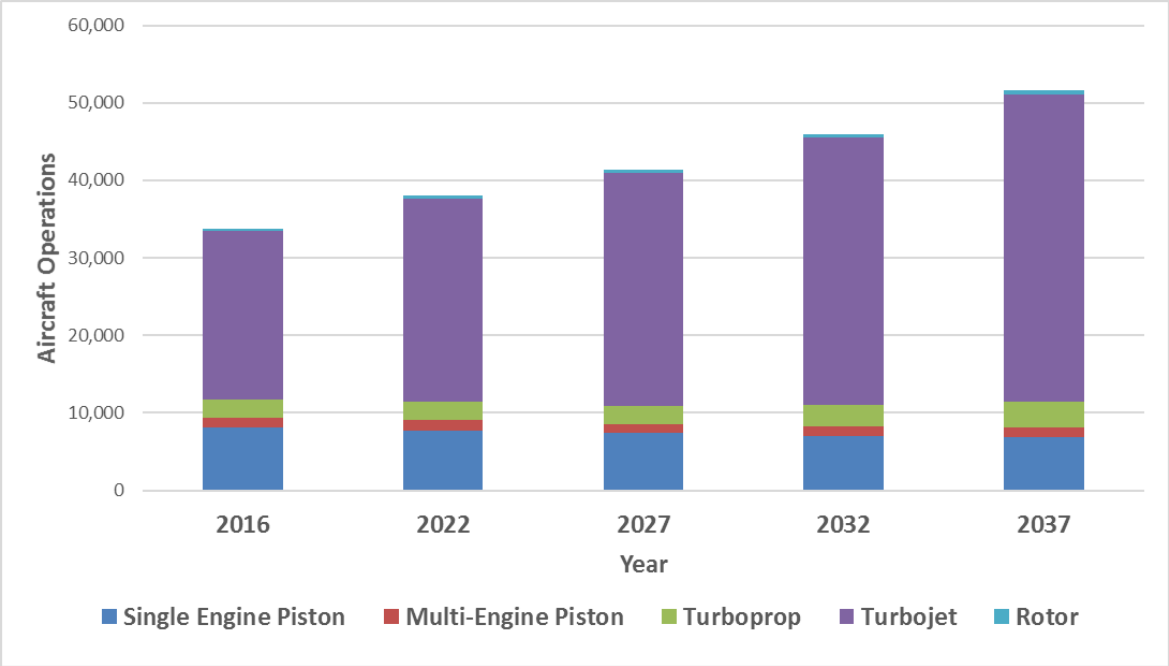


Table 8 presents a summary of the SJC general aviation forecast; additional detail is provided in **Appendix H**. In contrast to itinerant operations, local operations are projected to decline, reflecting decreased activity by piston powered aircraft.

Table 8 - Forecast of SJC General Aviation Activity

		Operations		
Year	Based Aircraft	Itinerant	Local	Total
2015	136	29,587	4,400	33,987
2016	137	29,380	4,363	33,743
Forecast				
2022	141	33,736	4,263	37,999
2027	144	37,347	4,069	41,416
2032	152	41,950	4,012	45,963
2037	164	47,562	4,021	51,583
Compounded Annual Growth Rate				
2016-2037	0.9%	2.3%	-0.4%	2.0%

Sources: Tables H.4 and H.6 in Appendix H.

8.2 Military

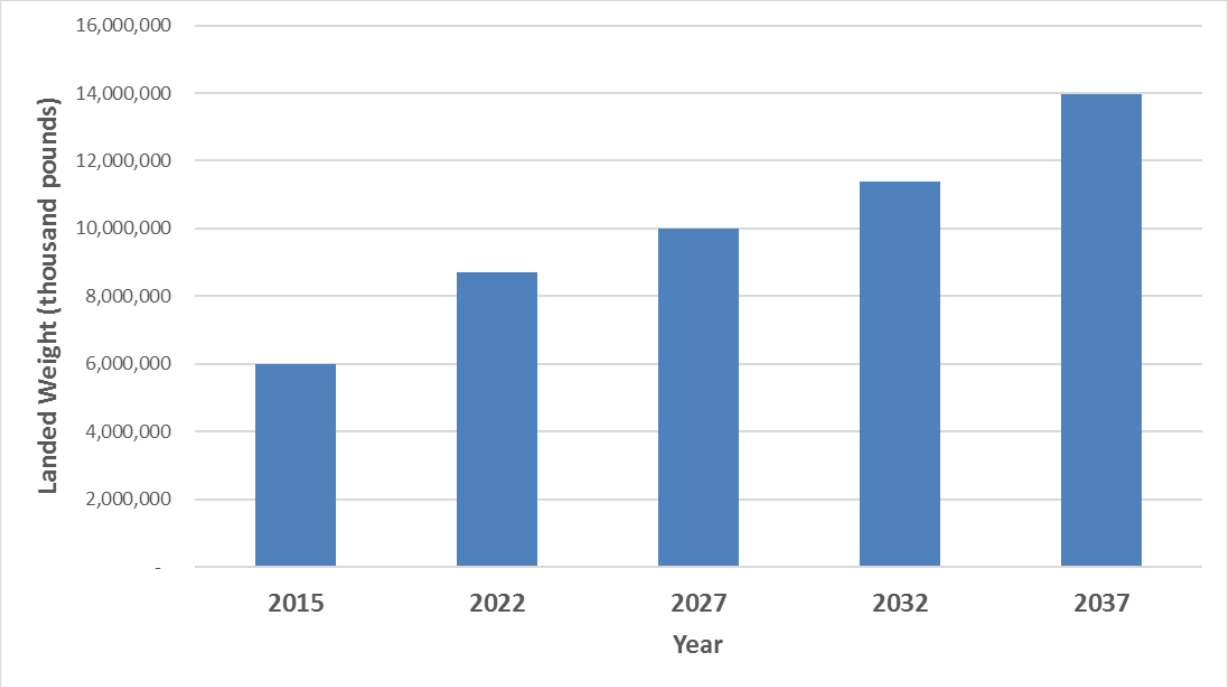
Military operations account for a very small percentage of SJC aviation activity. Since military activity depends mostly on unpredictable national and international policy factors instead of economic factors, standard practice in most forecasts is to keep military operations constant. The constant military operations assumption is consistent with industry practice employed in other similar airports and was used in this study.

Since 2010, the number of annual military operations at SJC has averaged about 250, and these activity levels were carried over into the forecast as detailed in **Appendix I**. It should be noted that future national defense actions could increase or decrease future military operations.

9 Landed Weight Forecast

The landed weight forecast is summarized in **Figure 11** and presented in more detail in **Appendix J**. The landed weight forecast represents the sum of the maximum gross landing weights of the passenger and cargo aircraft landings at SJC and was based on the passenger and cargo fleet mix forecasts. As shown, total landed weight (measured in thousands of pounds) is projected to increase from 6.0 million in 2015 to over 13.9 million in 2037, an average annual increase of approximately 3.9 percent.

FIGURE 11: Summary of Aircraft Landed Weight Forecasts



10 Peak Activity Forecast

Most airport facility requirements are based on peak activity levels, so a peak activity forecast is essential for a master plan. The peak activity forecasts were based on design day activity levels where the design day was defined as the average weekday during the peak month for the passenger, cargo, general aviation, and military categories. Peak hour passenger and aircraft operation forecasts were based on design day flight schedules (DDFS) for the base year – 2016 – and the ultimate forecast year – 2037. Intermediate years were interpolated.

Table 9 summarizes the design day and peak hour forecasts for 2016 and 2027. The design day share of annual passengers and operations is expected to remain unchanged, so design day activity is projected to grow at the same rate as annual activity in each category. Because of peak spreading – the tendency for passengers and aircraft operations to become more evenly distributed throughout the day as activity

increases – design hour activity is projected to grow slightly less rapidly than annual or design day activity. Appendix K provides more detail on the development of the DDFSs and the peak activity forecasts.

Table 9 – Projected SJC Design Level Demand

	Design Day		Design Hour	
	2016	2037	2016	2037
Air Passengers	34,200	71,400	2,900	5,700
Passenger Airline Operations	324	588	26	47
Cargo Airline Operations	8	11	4	6
General Aviation Operations	155	257	20	32
Military Operations	1	1	0	0
Total Operations[1]	487	856	43	72

[1]Design Day and Design Hour operations for each type of aviation activity do not coincide, so total is not additive.

Sources: Tables K.1 and K.2 in Appendix K

11 Summary of Forecasts

Table 10 and Figure 12 summarize the SJC aircraft operations forecasts. Total aircraft operations are projected to increase from 138,915 in 2016 to 237,717 in 2037, an average annual increase of 2.6 percent. Passenger aircraft operations are projected to grow most quickly, followed by general aviation operations. All-cargo and military are projected to remain stable or grow at more moderate rates.

Table 10 – Summary of SJC Aircraft Operations Forecast

Year	Passenger[1]	All-Cargo[2]	General Aviation[3]	Military[4]	Total
2015	93,256	1,542	33,987	236	129,021
2016	103,280	1,616	33,743	276	138,915
Forecast					
2022	126,114	1,730	37,999	250	166,093
2027	142,032	1,826	41,416	250	185,524
2032	156,348	1,882	45,963	250	204,443
2037	183,920	1,964	51,583	250	237,717
Compounded Annual Growth Rate					
2016-2037	2.8%	0.9%	2.0%	-0.5%	2.6%

[1]Table 6.
[2]Table 7.
[3]Table 8.
[4]Table I.1 in Appendix I.

Sources: As noted and HNTB analysis.

FIGURE 12: Summary of Aircraft Operations Forecasts

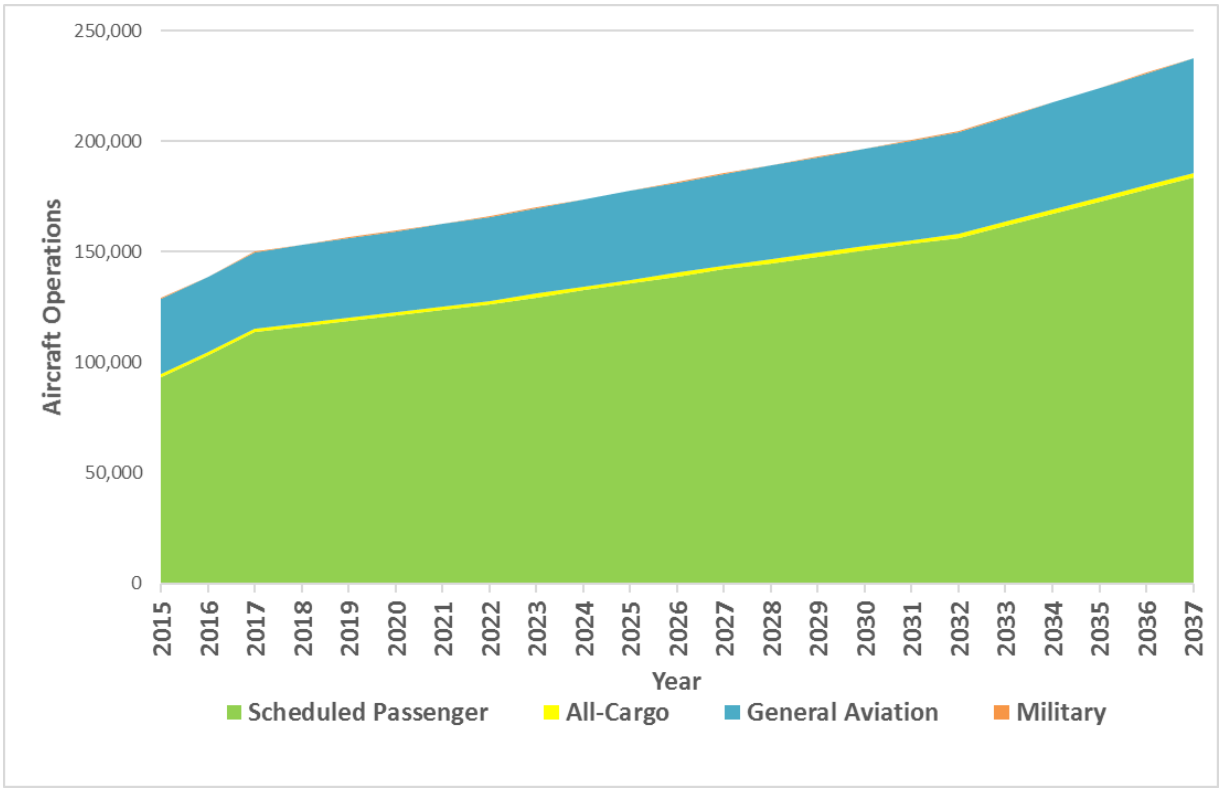


Table L.1 in **Appendix L** presents the combined fleet mix forecast for SJC including commercial carriers (passenger and cargo), general aviation and military. The fastest growth is anticipated among Design Group V aircraft, mostly because of the new international service. Rapid growth is also expected among Design Group III aircraft because of the high forecast in passenger activity. Design Group IV aircraft are expected to decline, as the DC-10s, Airbus A300, and Boeing 767 aircraft are retired and replaced by Design Group III aircraft domestically and Design Group V aircraft internationally.

A comparison with the most recent FAA TAF for SJC (2016) is provided in Table M.1 in **Appendix M**.

APPENDIX A: SOCIOECONOMIC DATA AND PROJECTIONS

Tables A.1 through **A.8** provide additional socioeconomic historical data and projections at a county level of detail.

Tables A.9 through **A.11** present additional historical data projections needed for the domestic and international aviation activity forecasts. Historical and projected world Gross Domestic Product (GDP) in **Table A.9** are taken from the Global Insight forecasts used by the FAA. **Table A.10** shows historical U.S. unemployment, along with several alternative forecasts that were used to derive an aggregate projection of U.S. unemployment. **Table A.11** shows the historical U.S. weighted exchange rate, which is a measure of the strength of the U.S. dollar which can affect the desirability and affordability of U.S. destinations for foreign visitors. No long-term forecast of the weighted value of the U.S. dollar could be uncovered so it was assumed to remain constant at the most recent level.

Table A.1 – Historical Population

	SJC Air Trade Area															
Year	Santa Clara	Alameda	Monterey	San Benito	San Mateo	Santa Cruz	Total SJC Air Trade Area	Contra Costa	Marin	Napa	San Francisco	Solano	Sonoma	Greater Bay Area (a)	California	United States
1980	1,301,515	1,109,931	292,406	25,194	588,442	189,305	3,506,793	658,783	222,944	99,331	680,830	237,456	301,586	5,707,723	23,800,800	227,224,719
1981	1,324,722	1,125,950	299,677	25,905	591,734	193,590	3,561,578	667,293	223,911	99,662	686,915	246,003	308,609	5,793,971	24,285,933	229,465,744
1982	1,345,039	1,140,269	306,241	26,916	595,851	197,353	3,611,669	678,903	223,426	101,178	695,546	254,348	314,636	5,879,706	24,820,007	231,664,432
1983	1,374,018	1,160,694	313,698	27,758	606,455	201,921	3,684,544	690,150	223,972	101,549	704,809	260,386	321,580	5,986,990	25,360,023	233,792,014
1984	1,396,226	1,179,132	321,458	28,959	613,706	205,964	3,745,445	698,814	223,232	101,902	713,196	264,416	326,863	6,073,868	25,844,397	235,824,907
1985	1,419,520	1,197,401	328,102	30,392	620,182	212,143	3,807,740	711,446	222,459	103,014	727,977	271,634	335,355	6,179,625	26,441,107	237,923,734
1986	1,429,933	1,215,506	335,849	31,649	621,584	216,661	3,851,182	725,367	224,013	104,237	737,396	283,617	345,270	6,271,082	27,102,238	240,132,831
1987	1,447,591	1,229,319	341,268	32,952	628,256	221,202	3,900,588	739,987	224,938	105,010	736,499	296,835	356,111	6,359,968	27,777,160	242,288,936
1988	1,472,234	1,251,100	345,947	34,374	636,614	225,700	3,965,969	759,242	226,013	106,130	730,471	310,048	367,893	6,465,766	28,464,250	244,499,004
1989	1,498,121	1,271,443	349,872	36,137	646,078	231,463	4,033,114	784,395	229,176	108,662	725,889	326,074	380,633	6,587,943	29,218,165	246,819,222
1990	1,498,307	1,306,166	357,535	36,835	650,174	229,616	4,078,633	809,317	230,522	111,284	723,496	343,463	390,495	6,687,210	29,959,515	249,622,814
1991	1,513,118	1,318,543	364,805	37,329	655,493	229,935	4,119,223	823,183	233,443	112,233	729,708	354,104	397,937	6,769,831	30,470,736	252,980,941
1992	1,531,886	1,332,208	371,860	38,321	662,931	232,912	4,170,118	839,768	235,820	114,322	734,861	359,919	405,151	6,859,959	30,974,659	256,514,224
1993	1,549,185	1,339,189	371,002	39,495	669,581	235,386	4,203,838	852,532	238,040	114,972	740,277	364,251	410,687	6,924,597	31,274,928	259,918,588
1994	1,561,366	1,341,707	352,363	40,786	674,871	237,714	4,208,807	861,979	239,032	116,077	742,316	366,072	416,152	6,950,435	31,484,435	263,125,821
1995	1,580,245	1,346,548	355,486	42,334	679,690	239,324	4,243,627	872,075	239,195	116,697	746,386	365,395	422,286	7,005,661	31,696,582	266,278,393
1996	1,608,695	1,359,099	362,215	44,169	687,243	241,168	4,302,589	884,227	238,705	117,996	753,934	367,608	428,399	7,093,458	32,018,834	269,394,284
1997	1,637,414	1,380,383	376,794	46,707	697,512	245,344	4,384,154	903,049	241,797	119,808	762,953	371,881	437,141	7,220,783	32,486,010	272,646,925
1998	1,658,960	1,405,903	387,889	49,071	702,651	250,889	4,455,363	921,663	244,706	121,583	770,262	378,657	445,901	7,338,135	32,987,675	275,854,104
1999	1,671,498	1,427,114	396,267	51,467	704,538	253,667	4,504,551	936,983	246,269	123,026	774,716	387,657	453,421	7,426,623	33,499,204	279,040,168
2000	1,684,947	1,449,840	402,990	53,781	707,820	255,835	4,555,213	952,810	247,520	124,565	777,885	396,974	460,421	7,515,388	33,987,977	282,162,411
2001	1,688,082	1,469,484	407,082	54,644	705,621	256,045	4,580,958	970,952	247,866	126,818	780,865	404,209	465,293	7,576,961	34,479,458	284,968,955
2002	1,669,348	1,462,106	408,977	55,056	697,628	254,531	4,547,646	979,862	246,225	128,744	772,723	408,226	465,298	7,548,724	34,871,843	287,625,193
2003	1,663,592	1,454,163	409,725	55,198	693,057	253,021	4,528,756	987,531	245,054	130,138	766,160	408,409	466,489	7,532,537	35,253,159	290,107,933
2004	1,663,167	1,445,721	408,731	54,849	690,161	252,356	4,514,985	992,424	243,769	130,387	761,325	409,301	466,809	7,519,000	35,574,576	292,805,298
2005	1,675,312	1,441,545	405,139	54,647	690,078	251,377	4,518,098	999,013	244,206	130,381	763,016	408,181	465,938	7,528,833	35,827,943	295,516,599
2006	1,691,159	1,444,484	401,831	54,124	690,176	251,616	4,533,390	1,000,834	244,580	131,440	768,650	408,402	465,188	7,552,484	36,021,202	298,379,912
2007	1,712,026	1,455,715	402,376	54,072	693,849	253,304	4,571,342	1,009,152	246,248	132,583	778,673	408,243	467,356	7,613,597	36,250,311	301,231,207
2008	1,740,964	1,477,208	406,022	54,267	703,830	256,520	4,638,811	1,023,344	248,398	134,093	791,152	408,972	473,091	7,717,861	36,604,337	304,093,966
2009	1,765,137	1,498,539	410,263	54,436	713,617	260,009	4,702,001	1,037,890	250,862	135,280	801,922	410,290	479,479	7,817,724	36,961,229	306,771,529
2010	1,786,930	1,513,625	416,364	55,532	719,951	263,213	4,755,615	1,052,894	252,884	136,829	805,825	414,101	484,666	7,902,814	37,336,011	309,347,057
2011	1,814,105	1,532,518	421,393	56,174	729,425	264,923	4,818,538	1,066,587	255,413	138,056	816,239	416,945	487,722	7,999,500	37,701,901	311,721,632
2012	1,841,098	1,556,249	426,411	56,871	740,738	266,632	4,887,999	1,079,358	256,143	139,135	829,691	420,724	490,838	8,103,888	38,062,780	314,112,078
2013	1,871,107	1,583,226	429,123	57,594	750,489	269,444	4,960,983	1,095,980	258,821	140,580	841,138	425,219	495,432	8,218,153	38,431,393	316,497,531
2014	1,894,605	1,610,921	431,344	58,267	758,581	271,804	5,025,522	1,111,339	260,750	141,667	852,469	431,131	500,292	8,323,170	38,802,500	318,857,056
2015	1,918,044	1,638,215	433,898	58,792	765,135	274,146	5,088,230	1,126,745	261,221	142,456	864,816	436,092	502,146	8,421,706	39,144,818	321,467,160
								Compounded Annual Growth Rate								
1980-2015	1.1%	1.1%	1.1%	2.5%	0.8%	1.1%	1.1%	1.5%	0.5%	1.0%	0.7%	1.8%	1.5%	1.1%	1.4%	1.0%
1980-2000	1.3%	1.3%	1.6%	3.9%	0.9%	1.5%	1.3%	1.9%	0.5%	1.1%	0.7%	2.6%	2.1%	1.4%	1.8%	1.1%
2000-2015	0.9%	0.8%	0.5%	0.6%	0.5%	0.5%	0.7%	1.1%	0.4%	0.9%	0.7%	0.6%	0.6%	0.8%	0.9%	0.9%

(a) SJC Air Trade Area plus Contra Costa, Marin, Napa, San Francisco, Solano, and Sonoma Counties.

Source: U.S. Department of Commerce, Bureau of Economic Analysis, and HNTB analysis.

Table A.2 – Projected Population

	SJC Air Trade Area															
Year	Santa Clara	Alameda	Monterey	San Benito	San Mateo	Santa Cruz	Total SJC Air Trade Area	Contra Costa	Marin	Napa	San Francisco	Solano	Sonoma	Greater Bay Area (a)	California	United States
Woods & Poole Projections (b)																
2015	1,910,833	1,621,337	434,382	58,878	763,825	273,018	5,062,273	1,123,230	261,784	142,880	856,802	434,077	504,727	8,385,773	39,155,924	321,545,081
2016	1,928,640	1,633,039	437,768	59,539	769,680	274,442	5,103,108	1,136,096	263,019	144,212	861,801	437,369	509,582	8,455,187	39,542,295	321,545,081
2022	2,038,473	1,704,589	458,522	63,652	805,548	283,068	5,353,852	1,216,120	270,477	152,425	892,171	457,532	539,564	8,882,141	41,935,185	336,690,447
2027	2,132,624	1,764,833	476,089	67,227	835,873	290,173	5,566,819	1,285,807	276,576	159,465	917,376	474,566	565,325	9,245,934	44,001,644	352,566,429
2032	2,225,891	1,822,921	493,170	70,837	865,306	296,758	5,774,883	1,356,298	282,149	166,439	941,080	491,081	590,926	9,602,856	46,067,607	368,838,293
2037	2,312,802	1,874,463	508,569	74,305	891,751	302,129	5,964,019	1,424,228	286,542	172,937	961,061	505,887	614,913	9,929,587	48,020,165	384,634,547
Compounded Annual Growth Rate																
2015-2037	0.9%	0.7%	0.7%	1.1%	0.7%	0.5%	0.7%	1.1%	0.4%	0.9%	0.5%	0.7%	0.9%	0.8%	0.9%	0.8%
California Department of Finance DRU Projections (c)																
2015	1,918,044	1,638,215	433,898	58,792	765,135	274,146	5,088,230	1,126,745	261,221	142,456	864,816	436,092	502,146	8,421,706	39,144,818	
2016	1,934,360	1,655,102	437,266	59,664	770,082	275,784	5,132,258	1,138,471	261,421	143,371	873,566	440,500	506,606	8,496,193	39,491,488	
2022	2,035,726	1,755,696	457,345	65,102	799,565	285,862	5,399,296	1,208,828	262,585	148,905	925,125	467,293	533,435	8,945,467	41,584,222	
2027	2,126,966	1,834,881	473,017	70,076	823,034	293,102	5,621,076	1,267,247	263,907	153,642	964,350	490,674	555,178	9,316,074	43,332,585	
2032	2,220,058	1,908,036	486,631	75,133	846,491	299,266	5,835,615	1,326,569	266,370	158,045	997,725	515,204	575,063	9,674,591	45,035,565	
2037	2,312,134	1,981,101	498,537	79,912	872,558	304,081	6,048,323	1,387,339	269,785	161,571	1,027,918	539,014	593,092	10,027,042	46,637,171	
Compounded Annual Growth Rate																
2015-2037	0.9%	0.9%	0.6%	1.4%	0.6%	0.5%	0.8%	1.0%	0.1%	0.6%	0.8%	1.0%	0.8%	0.8%	0.8%	

(a) SJC Air Trade Area plus Contra Costa, Marin, Napa, San Francisco, Solano, and Sonoma Counties.
(b) Woods & Poole Economics, Inc., 2016 State Profile: California.
(c) California Department of Finance, Demographic Research Unit Population Projections, December 2014. Growth rates applied to 2015 base year data.

Souces: As noted and HNTB analysis.

Table A.3 – Historical Employment

	SJC Air Trade Area															
Year	Santa Clara	Alameda	Monterey	San Benito	San Mateo	Santa Cruz	Total SJC Air Trade Area	Contra Costa	Marin	Napa	San Francisco	Solano	Sonoma	Greater Bay Area (a)	California	United States
1980	804,005	599,620	160,320	10,691	321,447	84,798	1,980,881	269,950	109,722	43,047	655,019	98,216	133,637	3,290,472	12,761,955	113,983,200
1981	821,564	602,234	161,159	10,873	322,669	87,088	2,005,587	273,907	112,540	44,376	660,452	100,008	137,159	3,334,029	12,934,962	114,914,000
1982	837,632	593,482	161,196	11,013	320,929	87,797	2,012,049	279,651	115,802	44,528	650,640	101,168	138,573	3,342,411	12,862,878	114,163,300
1983	868,034	606,565	164,668	11,233	326,800	93,297	2,070,597	292,913	122,046	45,542	647,798	103,847	145,902	3,428,645	13,182,023	115,645,700
1984	924,632	635,992	170,038	11,644	340,155	97,417	2,179,878	304,254	124,863	47,379	661,697	107,070	155,144	3,580,285	13,796,978	120,528,100
1985	937,285	659,313	175,384	12,247	348,589	102,627	2,235,445	318,246	128,516	49,000	666,164	111,397	161,324	3,670,092	14,284,986	123,796,700
1986	934,407	672,722	176,778	12,861	354,207	103,042	2,254,017	334,577	131,644	51,024	674,852	115,639	166,384	3,728,137	14,709,923	126,232,300
1987	965,173	691,523	183,254	13,779	359,918	108,605	2,322,252	355,199	134,975	52,434	682,608	119,521	174,046	3,841,035	15,300,046	129,548,400
1988	1,008,549	721,752	190,927	14,476	375,392	117,109	2,428,205	377,817	141,083	54,863	694,148	125,976	186,395	4,008,487	16,021,802	133,563,900
1989	1,020,991	737,111	194,992	15,076	386,700	119,693	2,474,563	387,349	143,464	56,480	697,150	131,381	193,548	4,083,935	16,425,901	136,177,800
1990	1,037,076	754,274	200,058	15,501	397,001	125,068	2,528,978	397,329	148,302	59,343	702,360	136,860	204,435	4,177,607	16,834,515	138,330,900
1991	1,024,758	756,513	200,838	15,493	401,046	129,334	2,527,982	397,024	148,744	60,173	685,459	137,031	207,198	4,163,611	16,750,052	137,612,800
1992	1,002,581	747,608	195,598	15,133	387,416	126,162	2,474,498	396,033	146,455	60,221	669,624	137,870	207,086	4,091,787	16,390,983	138,166,100
1993	1,006,740	751,343	191,239	16,295	389,888	128,059	2,483,564	399,261	148,857	60,849	669,328	139,183	210,765	4,111,807	16,367,123	140,774,400
1994	1,019,906	760,449	183,917	16,721	392,894	129,313	2,503,200	410,963	154,421	62,499	666,537	141,061	218,474	4,157,155	16,540,724	144,196,600
1995	1,058,145	789,089	187,617	17,664	407,659	133,854	2,594,028	409,991	158,421	64,022	671,666	139,996	221,033	4,259,157	16,939,791	147,915,800
1996	1,112,242	800,408	195,179	19,276	422,979	136,690	2,686,774	417,135	160,838	67,250	691,230	141,128	232,015	4,396,370	17,341,994	151,056,200
1997	1,156,287	811,229	197,557	19,270	436,531	136,897	2,757,771	433,670	164,194	70,898	704,504	143,144	242,030	4,516,211	17,667,115	154,541,200
1998	1,201,862	840,660	208,973	20,045	462,323	145,426	2,879,289	446,704	169,128	77,117	723,480	146,922	254,499	4,697,139	18,450,214	158,481,200
1999	1,206,708	861,252	218,615	21,197	474,341	146,451	2,928,564	458,835	172,937	81,487	735,587	153,224	263,927	4,794,561	18,888,132	161,531,300
2000	1,264,108	886,256	219,037	21,630	495,275	146,510	3,032,816	468,340	174,318	82,590	753,507	157,999	268,621	4,938,191	19,280,922	165,370,800
2001	1,226,979	886,315	217,956	21,722	484,406	145,207	2,982,585	475,483	176,995	84,371	732,142	162,871	273,682	4,888,129	19,411,367	165,519,200
2002	1,132,804	873,604	221,446	21,836	461,956	142,986	2,854,632	479,976	177,070	85,786	700,798	166,948	273,233	4,738,443	19,437,490	165,159,100
2003	1,089,888	875,815	225,063	22,343	450,043	141,999	2,805,151	480,129	177,684	86,743	684,435	171,013	270,576	4,675,731	19,573,490	166,026,500
2004	1,085,465	875,608	224,221	22,762	450,780	142,442	2,801,278	489,621	179,601	88,296	680,852	172,336	274,967	4,686,951	19,876,899	169,036,700
2005	1,102,841	882,367	224,270	22,918	455,507	142,750	2,830,653	495,703	180,090	89,231	687,494	174,067	276,676	4,733,914	20,255,748	172,557,400
2006	1,133,142	896,140	221,997	23,014	468,942	143,513	2,886,748	502,846	180,680	89,124	703,291	174,430	278,545	4,815,664	20,644,868	176,123,600
2007	1,169,637	912,003	226,953	23,670	483,469	146,137	2,961,869	509,367	183,544	91,648	729,913	174,634	282,795	4,933,770	21,040,405	179,885,700
2008	1,176,093	906,385	225,770	21,825	484,470	143,090	2,957,633	497,794	183,775	91,828	744,082	174,548	278,884	4,928,544	20,818,920	179,639,900
2009	1,122,864	868,462	220,002	20,773	469,941	139,736	2,841,778	482,399	178,683	89,013	723,046	170,055	266,092	4,751,066	20,038,208	174,233,700
2010	1,116,112	855,940	222,066	20,540	462,712	138,820	2,816,190	473,656	178,175	88,562	720,099	168,460	262,750	4,707,892	19,803,742	173,034,700
2011	1,150,047	868,207	223,032	20,561	475,101	138,540	2,875,488	479,813	180,581	89,544	739,950	166,135	266,123	4,797,634	20,172,087	176,278,700
2012	1,194,992	905,640	227,931	21,079	494,444	140,550	2,984,636	493,231	184,558	92,617	787,124	169,488	269,458	4,981,112	20,850,443	179,081,700
2013	1,239,470	939,534	232,801	22,238	515,107	144,724	3,093,874	507,301	189,805	96,230	820,542	174,243	279,431	5,161,426	21,496,020	182,390,100
2014	1,281,106	965,585	240,804	23,165	534,572	148,684	3,193,916	517,311	192,713	99,435	854,119	177,011	289,314	5,323,819	22,040,057	185,798,800
2015	1,330,873	1,006,262	244,479	23,356	538,038	153,381	3,296,389	534,004	195,366	103,236	893,659	187,017	296,678	5,506,349	22,625,879	188,866,185
							Compounded Annual Growth Rate									
1980-2015	1.5%	1.5%	1.2%	2.3%	1.5%	1.7%	1.5%	2.0%	1.7%	2.5%	0.9%	1.9%	2.3%	1.5%	1.6%	1.5%
1980-2000	2.3%	2.0%	1.6%	3.6%	2.2%	2.8%	2.2%	2.8%	2.3%	3.3%	0.7%	2.4%	3.6%	2.1%	2.1%	1.9%
2000-2015	0.3%	0.9%	0.7%	0.5%	0.6%	0.3%	0.6%	0.9%	0.8%	1.5%	1.1%	1.1%	0.7%	0.7%	1.1%	0.9%

(a) SJC Air Trade Area plus Contra Costa, Marin, Napa, San Francisco, Solano, and Sonoma Counties.

Source: U.S. Department of Commerce, Bureau of Economic Analysis, and HNTB analysis.

Table A.4 – Projected Employment

	SJC Air Trade Area															
Year	Santa Clara	Alameda	Monterey	San Benito	San Mateo	Santa Cruz	Total SJC Air Trade Area	Contra Costa	Marin	Napa	San Francisco	Solano	Sonoma	Greater Bay Area (a)	California	United States
							Woods & Poole Projections (b)									
2015	1,330,873	1,006,262	244,479	23,356	538,038	153,381	3,296,389	534,004	195,366	103,236	893,659	187,017	296,678	5,506,349	22,625,879	188,866,185
2016	1,355,216	1,019,808	248,121	23,709	545,613	155,733	3,348,199	543,477	198,173	104,900	905,983	189,891	301,327	5,591,950	23,000,963	191,870,817
2022	1,497,916	1,096,379	269,255	25,629	590,002	169,104	3,648,285	599,032	214,285	114,369	978,264	206,065	327,366	6,087,666	25,189,265	209,147,783
2027	1,618,334	1,158,007	286,628	27,127	626,495	179,863	3,896,454	645,361	227,275	122,018	1,037,249	218,980	348,007	6,495,343	27,009,277	223,284,064
2032	1,739,546	1,216,758	303,381	28,546	661,627	190,083	4,139,941	690,852	239,540	129,335	1,093,320	231,180	367,410	6,891,578	28,798,731	236,975,619
2037	1,861,040	1,272,303	319,501	29,892	695,281	199,709	4,377,727	735,220	250,994	136,396	1,146,165	242,618	385,584	7,274,704	30,547,205	250,168,689
							Compounded Annual Growth Rate									
2015-2037	1.5%	1.1%	1.2%	1.1%	1.2%	1.2%	1.3%	1.5%	1.1%	1.3%	1.1%	1.2%	1.2%	1.3%	1.4%	1.3%

(a) SJC Air Trade Area plus Contra Costa, Marin, Napa, San Francisco, Solano, and Sonoma Counties.
(b) Woods & Poole Economics, Inc., 2016 State Profile: California. Adjusted for 2015 base year data.

Souces: As noted and HNTB analysis.

Table A.5 – Historical Income (thousands of 2015 dollars)

	SJC Air Trade Area															
Year	Santa Clara	Alameda	Monterey	San Benito	San Mateo	Santa Cruz	Total SJC Air Trade Area	Contra Costa	Marin	Napa	San Francisco	Solano	Sonoma	Greater Bay Area (a)	California	United States
1980	43,169,486	33,236,125	8,708,749	616,085	21,884,165	5,305,180	112,919,790	22,471,911	9,796,070	2,895,969	25,816,662	6,270,779	8,642,341	188,813,521	706,371,531	5,741,021,129
1981	44,991,662	34,298,178	9,201,865	620,284	22,869,275	5,520,109	117,501,373	23,192,467	10,181,333	3,018,511	26,699,933	6,471,699	9,033,197	196,098,513	728,336,717	5,903,610,453
1982	46,644,383	34,602,361	9,220,374	644,233	23,281,549	5,582,144	119,975,043	23,576,164	10,383,291	3,069,377	26,938,355	6,727,173	9,115,934	199,785,338	737,862,660	5,991,580,758
1983	49,405,553	36,110,659	9,856,484	684,249	24,141,158	6,029,694	126,227,796	24,811,673	10,836,486	3,137,318	28,146,648	7,122,857	9,607,397	209,890,175	765,192,674	6,139,177,406
1984	53,265,066	38,785,317	10,220,199	747,673	26,033,535	6,456,704	135,508,494	26,569,040	11,358,114	3,303,199	29,839,051	7,625,207	10,408,155	224,611,259	819,918,438	6,536,592,179
1985	54,640,446	40,495,910	10,436,801	781,731	26,708,144	6,616,501	139,679,533	27,871,554	11,638,704	3,443,772	30,524,842	8,184,679	10,924,007	232,267,092	856,317,946	6,763,927,408
1986	55,546,974	41,998,982	11,051,629	847,925	27,701,331	6,952,804	144,099,644	29,505,322	11,990,164	3,623,574	31,900,371	8,757,805	11,572,162	241,449,044	900,430,207	7,018,292,085
1987	57,300,891	43,213,253	11,488,813	899,461	28,403,579	7,248,008	148,554,005	30,970,113	12,149,053	3,683,888	32,242,804	9,202,977	12,070,962	248,873,802	942,370,590	7,230,303,587
1988	60,368,585	45,100,433	11,662,745	951,531	29,766,869	7,633,992	155,484,156	32,600,843	12,780,347	3,857,153	34,475,890	9,679,464	12,739,696	261,617,551	985,489,917	7,524,071,519
1989	62,149,935	46,805,833	11,825,168	1,011,742	30,909,309	7,773,839	160,475,826	33,799,293	12,950,100	4,096,086	34,395,429	10,299,223	13,664,031	269,679,989	1,017,830,002	7,794,718,017
1990	62,471,414	47,948,603	12,020,689	1,054,115	31,075,501	8,084,976	162,655,297	34,444,807	12,998,622	4,172,290	34,558,043	11,027,592	14,094,150	273,950,802	1,044,994,480	7,936,108,783
1991	62,902,062	47,832,413	11,883,066	1,051,832	31,273,069	8,120,022	163,062,464	34,714,323	13,246,600	4,262,705	35,638,703	11,082,385	14,232,278	276,239,458	1,044,877,211	7,943,821,154
1992	65,927,281	49,015,789	12,579,306	1,094,236	32,225,378	8,458,089	169,300,078	36,539,570	13,894,876	4,346,743	36,129,967	11,401,715	14,662,316	286,275,266	1,073,653,642	8,269,320,628
1993	65,484,191	49,287,274	12,480,330	1,160,468	32,899,768	8,568,120	169,880,151	37,333,848	14,300,523	4,414,879	36,162,092	11,533,489	15,002,359	288,627,340	1,072,628,383	8,422,843,150
1994	66,793,686	49,814,751	12,258,026	1,219,263	33,604,624	8,724,024	172,414,374	38,093,139	14,846,990	4,516,775	36,414,217	11,336,154	15,413,355	293,035,004	1,084,111,442	8,676,306,873
1995	72,138,632	51,830,714	12,798,357	1,322,446	35,430,357	9,127,737	182,648,244	39,596,818	15,601,750	4,622,023	38,870,458	11,409,368	15,784,354	308,533,014	1,117,364,798	8,994,961,546
1996	76,881,147	54,427,015	13,001,492	1,418,244	38,816,827	9,627,329	194,172,056	41,701,326	16,431,046	4,858,675	40,874,056	11,627,692	16,666,899	326,331,750	1,163,184,954	9,349,150,686
1997	83,819,951	57,076,303	13,804,890	1,577,372	39,893,171	10,217,923	206,389,611	44,722,255	17,659,820	5,130,939	42,518,522	12,167,137	17,913,991	346,502,275	1,216,679,664	9,760,894,098
1998	90,185,531	62,044,923	14,963,159	1,748,389	44,365,074	11,006,648	224,313,724	48,343,191	19,768,052	5,500,187	47,964,147	12,929,027	19,321,662	378,139,990	1,315,736,410	10,389,657,430
1999	99,718,590	66,457,621	15,703,453	1,877,284	49,785,179	11,941,318	245,483,445	51,185,423	20,956,198	5,894,582	51,646,199	13,643,951	20,169,397	408,979,193	1,385,977,721	10,778,285,631
2000	121,551,891	74,615,366	16,903,697	2,078,204	57,055,674	13,506,933	285,711,765	56,836,088	22,834,998	6,343,875	58,592,630	14,762,984	22,437,662	467,520,001	1,494,061,684	11,367,572,334
2001	108,464,458	74,000,280	16,854,445	2,052,638	52,971,956	12,949,085	267,292,861	57,637,611	22,631,460	6,344,378	58,183,637	15,635,394	22,351,056	450,076,398	1,518,106,665	11,608,226,511
2002	98,362,156	73,825,415	16,970,417	2,076,328	48,816,353	12,694,329	252,744,999	58,003,807	22,162,725	6,405,728	54,978,672	15,968,779	22,038,180	432,302,888	1,524,635,194	11,662,097,328
2003	97,235,932	74,919,908	17,548,105	2,164,062	48,262,958	12,551,374	252,682,338	57,948,465	22,200,040	6,545,169	53,116,747	16,418,623	21,933,280	430,844,662	1,558,765,370	11,852,573,699
2004	100,368,215	76,091,070	17,878,039	2,219,264	50,568,333	12,832,637	259,957,559	60,898,592	23,079,969	6,763,101	54,827,916	16,619,177	22,137,201	444,283,515	1,616,470,697	12,258,670,830
2005	103,426,800	76,512,639	18,062,705	2,201,618	53,868,310	12,655,591	266,727,662	62,322,113	23,746,392	6,887,329	57,980,759	16,630,797	22,346,948	456,642,001	1,659,437,575	12,585,961,791
2006	111,368,980	79,070,801	18,876,663	2,250,761	58,147,264	13,240,112	282,954,581	64,624,680	24,719,626	7,015,007	62,785,767	16,813,880	23,144,104	482,057,646	1,735,059,035	13,148,823,950
2007	118,144,962	78,970,513	18,876,836	2,258,161	60,459,603	13,423,748	292,133,822	64,996,803	24,306,811	7,101,544	64,552,961	16,947,139	23,117,643	493,156,723	1,764,239,030	13,519,584,101
2008	115,049,680	78,090,831	18,306,523	2,155,976	58,440,466	13,059,544	285,103,019	64,247,936	23,725,718	7,012,430	64,845,462	16,967,430	22,321,086	484,223,083	1,752,908,897	13,663,135,314
2009	107,494,333	74,654,085	18,162,870	2,089,651	54,911,470	12,126,637	269,439,045	60,517,665	21,528,111	6,696,025	60,804,366	16,525,951	21,310,608	456,821,771	1,682,242,027	13,219,743,514
2010	114,552,911	75,765,011	18,218,389	2,065,979	55,190,744	12,130,777	277,923,810	60,409,992	21,631,933	6,609,035	62,032,960	16,244,603	21,296,734	466,149,065	1,704,744,672	13,414,065,957
2011	123,034,657	79,833,630	18,412,775	2,143,560	58,940,256	12,741,517	295,106,395	63,793,284	23,287,516	6,925,828	66,307,849	16,576,005	22,094,941	494,091,817	1,776,909,178	13,905,723,875
2012	136,078,215	83,048,865	19,104,181	2,205,083	65,541,236	13,527,156	319,504,735	68,222,747	24,658,640	7,453,249	72,781,219	16,780,570	22,888,686	532,289,846	1,868,995,906	14,339,356,380
2013	135,975,766	86,653,043	19,517,779	2,318,927	65,397,949	13,690,240	323,553,704	67,887,432	24,833,172	7,528,993	74,123,640	17,376,801	23,673,769	538,977,512	1,881,622,369	14,308,699,085
2014	142,309,319	90,909,670	19,950,122	2,424,685	68,222,731	14,253,444	338,069,972	71,067,319	25,795,716	7,758,250	77,470,419	18,194,653	24,682,262	563,038,591	1,945,482,853	14,728,230,674
2015	158,728,715	101,370,460	21,623,627	2,565,863	74,641,211	15,696,689	374,626,565	74,756,916	28,492,821	8,758,573	89,533,450	19,407,853	26,874,652	622,450,830	2,103,669,473	15,324,108,725
	Compounded Annual Growth Rate															
1980-2015	3.8%	3.2%	2.6%	4.2%	3.6%	3.1%	3.5%	3.5%	3.1%	3.2%	3.6%	3.3%	3.3%	3.5%	3.2%	2.8%
1980-2000	5.3%	4.1%	3.4%	6.3%	4.9%	4.8%	4.8%	4.7%	4.3%	4.0%	4.2%	4.4%	4.9%	4.6%	3.8%	3.5%
2000-2015	1.8%	2.1%	1.7%	1.4%	1.8%	1.0%	1.8%	1.8%	1.5%	2.2%	2.9%	1.8%	1.2%	1.9%	2.3%	2.0%

(a) SJC Air Trade Area plus Contra Costa, Marin, Napa, San Francisco, Solano, and Sonoma Counties.

Source: U.S. Department of Commerce, Bureau of Economic Analysis, and HNTB analysis.

Table A.6 – Historical Per Capita Income (2015 dollars)

	SJC Air Trade Area															
Year	Santa Clara	Alameda	Monterey	San Benito	San Mateo	Santa Cruz	Total SJC Air Trade Area	Contra Costa	Marin	Napa	San Francisco	Solano	Sonoma	Greater Bay Area (a)	California	United States
1980	33,169	29,944	29,783	24,454	37,190	28,025	32,200	34,111	43,940	29,155	37,919	26,408	28,656	33,080	29,678	25,266
1981	33,963	30,462	30,706	23,945	38,648	28,514	32,991	34,756	45,470	30,287	38,869	26,307	29,271	33,845	29,990	25,728
1982	34,679	30,346	30,108	23,935	39,073	28,285	33,219	34,727	46,473	30,336	38,730	26,449	28,973	33,979	29,729	25,863
1983	35,957	31,111	31,420	24,650	39,807	29,862	34,259	35,951	48,383	30,895	39,935	27,355	29,876	35,058	30,173	26,259
1984	38,149	32,893	31,793	25,818	42,420	31,349	36,180	38,020	50,880	32,415	41,838	28,838	31,843	36,980	31,725	27,718
1985	38,492	33,820	31,810	25,722	43,065	31,189	36,683	39,176	52,318	33,430	41,931	30,131	32,574	37,586	32,386	28,429
1986	38,846	34,553	32,907	26,792	44,566	32,091	37,417	40,676	53,524	34,763	43,261	30,879	33,516	38,502	33,223	29,227
1987	39,584	35,152	33,665	27,296	45,210	32,766	38,085	41,852	54,011	35,081	43,778	31,004	33,897	39,131	33,926	29,842
1988	41,005	36,049	33,713	27,682	46,758	33,824	39,205	42,939	56,547	36,344	47,197	31,219	34,629	40,462	34,622	30,773
1989	41,485	36,813	33,799	27,997	47,841	33,586	39,790	43,090	56,507	37,696	47,384	31,586	35,898	40,935	34,836	31,581
1990	41,695	36,709	33,621	28,617	47,796	35,211	39,880	42,560	56,388	37,492	47,765	32,107	36,093	40,966	34,880	31,792
1991	41,571	36,277	32,574	28,177	47,709	35,314	39,586	42,171	56,744	37,981	48,840	31,297	35,765	40,804	34,291	31,401
1992	43,037	36,793	33,828	28,554	48,610	36,315	40,598	43,512	58,922	38,022	49,166	31,679	36,190	41,731	34,662	32,237
1993	42,270	36,804	33,640	29,383	49,135	36,400	40,411	43,792	60,076	38,400	48,849	31,664	36,530	41,681	34,297	32,406
1994	42,779	37,128	34,788	29,894	49,794	36,700	40,965	44,193	62,113	38,912	49,055	30,967	37,038	42,161	34,433	32,974
1995	45,650	38,492	36,002	31,238	52,127	38,140	43,041	45,405	65,226	39,607	52,078	31,225	37,378	44,041	35,252	33,780
1996	47,791	40,046	35,894	32,109	56,482	39,920	45,129	47,161	68,834	41,177	54,214	31,631	38,905	46,005	36,328	34,704
1997	51,190	41,348	36,638	33,772	57,194	41,647	47,076	49,524	73,036	42,826	55,729	32,718	40,980	47,987	37,452	35,800
1998	54,363	44,132	38,576	35,630	63,140	43,871	50,347	52,452	80,783	45,238	62,270	34,144	43,332	51,531	39,886	37,664
1999	59,658	46,568	39,628	36,475	70,664	47,075	54,497	54,628	85,095	47,913	66,665	35,196	44,483	55,069	41,373	38,626
2000	72,140	51,465	41,946	38,642	80,608	52,795	62,722	59,651	92,255	50,928	75,323	37,189	48,733	62,208	43,959	40,287
2001	64,253	50,358	41,403	37,564	75,071	50,573	58,349	59,362	91,305	50,027	74,512	38,681	48,037	59,401	44,029	40,735
2002	58,922	50,493	41,495	37,713	69,975	49,873	55,577	59,196	90,010	49,756	71,149	39,117	47,364	57,268	43,721	40,546
2003	58,449	51,521	42,829	39,205	69,638	49,606	55,795	58,680	90,592	50,294	69,329	40,201	47,018	57,198	44,216	40,856
2004	60,348	52,632	43,740	40,461	73,270	50,851	57,577	61,363	94,680	51,869	72,016	40,604	47,422	59,088	45,439	41,866
2005	61,736	53,077	44,584	40,288	78,061	50,345	59,035	62,384	97,239	52,825	75,989	40,744	47,961	60,652	46,317	42,590
2006	65,854	54,740	46,977	41,585	84,250	52,620	62,416	64,571	101,070	53,370	81,683	41,170	49,752	63,828	48,168	44,067
2007	69,009	54,249	46,913	41,762	87,137	52,995	63,905	64,407	98,709	53,563	82,901	41,512	49,465	64,773	48,668	44,881
2008	66,084	52,864	45,088	39,729	83,032	50,910	61,460	62,782	95,515	52,295	81,963	41,488	47,181	62,741	47,888	44,931
2009	60,899	49,818	44,271	38,387	76,948	46,639	57,303	58,308	85,817	49,498	75,823	40,279	44,445	58,434	45,514	43,093
2010	64,106	50,055	43,756	37,203	76,659	46,087	58,441	57,375	85,541	48,301	76,981	39,229	43,941	58,985	45,660	43,363
2011	67,821	52,093	43,695	38,159	80,804	48,095	61,244	59,811	91,176	50,167	81,236	39,756	45,302	61,765	47,130	44,609
2012	73,911	53,365	44,802	38,773	88,481	50,733	65,365	63,207	96,269	53,568	87,721	39,885	46,632	65,683	49,103	45,650
2013	72,671	54,732	45,483	40,263	87,140	50,809	65,220	61,942	95,947	53,557	88,123	40,866	47,784	65,584	48,961	45,210
2014	75,113	56,433	46,251	41,613	89,935	52,440	67,271	63,947	98,929	54,764	90,878	42,202	49,336	67,647	50,138	46,191
2015	82,756	61,879	49,836	43,643	97,553	57,257	73,626	66,348	109,076	61,483	103,529	44,504	53,520	73,910	53,741	47,669
							Compounded Annual Growth Rate									
1980-2015	2.6%	2.1%	1.5%	1.7%	2.8%	2.1%	2.4%	1.9%	2.6%	2.2%	2.9%	1.5%	1.8%	2.3%	1.7%	1.8%
1980-2000	4.0%	2.7%	1.7%	2.3%	3.9%	3.2%	3.4%	2.8%	3.8%	2.8%	3.5%	1.7%	2.7%	3.2%	2.0%	2.4%
2000-2015	0.9%	1.2%	1.2%	0.8%	1.3%	0.5%	1.1%	0.7%	1.1%	1.3%	2.1%	1.2%	0.6%	1.2%	1.3%	1.1%

(a) SJC Air Trade Area plus Contra Costa, Marin, Napa, San Francisco, Solano, and Sonoma Counties.

Source: U.S. Department of Commerce, Bureau of Economic Analysis, and HNTB analysis.

Table A.7 – Projected Per Capita Income (2015 dollars)

	SJC Air Trade Area															
Year	Santa Clara	Alameda	Monterey	San Benito	San Mateo	Santa Cruz	Total SJC Air Trade Area	Contra Costa	Marin	Napa	San Francisco	Solano	Sonoma	Greater Bay Area (a)	California	United States
								Woods & Poole Projections (b)								
2015	82,756	61,879	49,836	43,643	97,553	57,257	73,626	66,348	109,076	61,483	103,529	44,504	53,520	73,910	53,741	47,669
2016	84,031	62,794	50,571	44,206	98,924	58,282	74,719	67,334	110,915	62,439	105,114	45,245	54,329	75,017	54,553	46,678
2022	91,671	68,302	55,046	47,169	107,119	64,276	81,270	73,004	121,583	68,138	115,295	49,648	59,034	81,659	59,480	54,065
2027	98,119	72,905	58,775	49,330	113,939	69,177	86,777	77,546	130,300	72,798	124,096	53,247	62,790	87,191	63,569	57,999
2032	104,384	77,145	62,130	51,028	120,451	73,674	92,023	81,613	138,535	76,970	132,530	56,420	66,035	92,367	67,248	61,482
2037	110,896	81,350	65,367	52,505	127,121	78,074	97,385	85,521	146,769	81,017	141,110	59,418	69,057	97,574	70,800	64,780
								Compounded Annual Growth Rate								
2015-2037	1.3%	1.3%	1.2%	0.8%	1.2%	1.4%	1.3%	1.2%	1.4%	1.3%	1.4%	1.3%	1.2%	1.3%	1.3%	1.4%

(a) SJC Air Trade Area plus Contra Costa, Marin, Napa, San Francisco, Solano, and Sonoma Counties.
(b) Woods & Poole Economics, Inc., 2016 State Profile: California. Applied to 2015 base year.

Souces: As noted and HNTB analysis.

Table A.8 – Projected Income (thousands of 2015 dollars)

	SJC Air Trade Area															
Year	Santa Clara	Alameda	Monterey	San Benito	San Mateo	Santa Cruz	Total SJC Air Trade Area	Contra Costa	Marin	Napa	San Francisco	Solano	Sonoma	Greater Bay Area (a)	California	United States
Woods & Poole Projections (b)																
2015	158,131,965	100,326,073	21,647,747	2,569,616	74,513,417	15,632,103	372,820,922	74,523,704	28,554,231	8,784,642	88,703,769	19,318,177	27,012,786	619,718,231	2,104,266,317	15,106,075,076
2016	162,065,617	102,545,022	22,138,244	2,631,989	76,139,488	15,995,040	381,515,400	76,497,703	29,172,713	9,004,410	90,587,754	19,788,662	27,684,963	634,251,605	2,157,160,701	15,488,555,581
2022	186,869,173	116,426,059	25,239,954	3,002,427	86,289,704	18,194,540	436,021,857	88,781,165	32,885,392	10,386,002	102,863,000	22,715,771	31,852,363	725,505,549	2,494,315,483	17,939,711,404
2027	209,251,547	128,665,653	27,982,146	3,316,339	95,238,307	20,073,384	484,527,377	99,708,908	36,037,983	11,608,670	113,842,605	25,269,264	35,496,616	806,491,423	2,797,142,376	20,152,750,716
2032	232,347,604	140,628,795	30,640,834	3,614,685	104,226,860	21,863,302	533,322,080	110,691,879	39,087,591	12,810,752	124,721,209	27,706,830	39,021,759	887,362,100	3,097,946,314	22,348,841,600
2037	256,480,818	152,486,889	33,243,659	3,901,409	113,360,092	23,588,447	583,061,314	121,801,244	42,055,379	14,010,914	135,615,209	30,058,965	42,464,112	969,067,137	3,399,827,502	24,556,199,390
Compounded Annual Growth Rate																
2015-2037	2.2%	1.9%	2.0%	1.9%	1.9%	1.9%	2.1%	2.3%	1.8%	2.1%	1.9%	2.0%	2.1%	2.1%	2.2%	2.2%
Hybrid Projections (c)																
2015	158,728,715	101,370,460	21,623,627	2,565,863	74,641,211	15,696,689	374,626,565	74,756,916	28,492,821	8,758,573	89,533,450	19,407,853	26,874,652	622,450,830	2,103,669,473	
2016	162,546,275	103,930,445	22,112,858	2,637,515	76,179,255	16,073,255	383,479,602	76,657,621	28,995,471	8,951,899	91,824,425	19,930,324	27,523,281	637,362,623	2,154,389,014	
2022	186,617,353	119,916,746	25,175,165	3,070,822	85,648,809	18,374,127	438,803,023	88,248,823	31,925,859	10,146,155	106,662,436	23,200,389	31,490,546	730,477,231	2,473,440,115	
2027	208,696,388	133,772,522	27,801,589	3,456,882	93,775,448	20,276,004	487,778,834	98,269,658	34,387,207	11,184,770	119,671,886	26,126,968	34,859,488	812,278,811	2,754,610,936	
2032	231,738,731	147,194,971	30,234,563	3,833,903	101,960,577	22,048,076	537,010,821	108,265,599	36,901,643	12,164,669	132,228,364	29,067,851	37,974,247	893,613,194	3,028,543,736	
2037	256,406,740	161,161,851	32,587,897	4,195,806	110,920,262	23,740,848	589,013,404	118,646,464	39,595,977	13,090,070	145,049,393	32,027,316	40,957,217	978,379,841	3,301,911,532	
Compounded Annual Growth Rate																
2015-2037	2.2%	2.1%	1.9%	2.3%	1.8%	1.9%	2.1%	2.1%	1.5%	1.8%	2.2%	2.3%	1.9%	2.1%	2.1%	

(a) SJC Air Trade Area plus Contra Costa, Marin, Napa, San Francisco, Solano, and Sonoma Counties.
(b) Woods & Poole Economics, Inc., 2016 State Profile: California. Converted to 2015 dollars.
(c) California Department of Finance projections from Table A.2 multiplied by per capita income projections from Table A.7.

Souces: As noted and HNTB analysis.

Table A.9 – Historical and Projected World Gross Domestic Product (GDP) (billions of 2010 U.S. Dollars)

	World GDP	
Year	Historical	Projected
1990	37,584	
1991	38,100	
1992	38,812	
1993	39,436	
1994	40,680	
1995	41,878	
1996	43,261	
1997	44,878	
1998	45,981	
1999	47,525	
2000	49,560	
2001	50,418	
2002	51,456	
2003	52,901	
2004	55,091	
2005	57,085	
2006	59,426	
2007	61,793	
2008	63,741	
2009	62,686	
2010	65,424	
2011	67,477	
2012	69,137	
2013	70,778	
2014	72,760	
2015	74,355	74,355
2016		76,373
2017		78,697
2022		92,163
2027		107,033
2032		122,775
2037		*139,736*
Compounded Annual Growth Rate		
1990-2015	2.8%	
2015-2037		2.9%

Sources: FAA Aerospace Forecast: Fiscal Years 2016-2036 and HNTB analysis.

Table A.10 – Historical and Projected U.S. Unemployment Rate

		Projected					
Year	Historical (a)	W&P (b)	Federal Reserve (c)	Statista (d)	CBO (e)	IMF (f)	Average (g)
1990	5.6						
1991	6.9						
1992	7.5						
1993	6.9						
1994	6.1						
1995	5.6						
1996	5.4						
1997	4.9						
1998	4.5						
1999	4.2						
2000	4.0						
2001	4.7						
2002	5.8						
2003	6.0						
2004	5.5						
2005	5.1						
2006	4.6						
2007	4.6						
2008	5.8						
2009	9.3						
2010	9.6						
2011	8.9						
2012	8.1						
2013	7.4						
2014	6.2						
2015	5.3	5.4	5.3	5.5	5.3	5.3	5.4
2016	4.9	5.2	4.8	4.8	4.7	4.9	4.9
2017		5.2	4.6	4.4	4.7	4.8	4.7
2022		5.2	*4.8*	*5.0*	4.7	5.0	4.9
2027		5.2	*4.8*	*5.0*	4.7	*5.0*	4.9
2032		5.2	*4.8*	*5.0*	*4.7*	*5.0*	4.9
2037		5.2	*4.8*	*5.0*	*4.7*	*5.0*	4.9

Note: Numbers in italics are extrapolated.
(a) Bureau of Labor Statistics, 2017.
(b) Woods & Poole Economics, Inc., 2016 State Profile: California.
(c) Board of Governors of the Federal Reserve System, September 21, 2016.
(d) Statista: The Statistics Portal, 2016.
(e) Congressional Budget Office, The Budget and Economic Outlook: 2017 to 2027.
(f) International Monetary Fund, World Economic Outlook Database, 2016.
(g) Average of individual unemployment rate projections.

Sources: As noted and HNTB analysis.

Table A.11 – U.S. Weighted Exchange Rate

Year	US Weighted Exchange Rate (a) Historical	Projected
1990	89.9	
1991	88.5	
1992	87.0	
1993	89.9	
1994	88.4	
1995	83.5	
1996	87.2	
1997	93.9	
1998	98.4	
1999	97.0	
2000	101.8	
2001	107.8	
2002	106.2	
2003	93.2	
2004	85.5	
2005	83.9	
2006	82.6	
2007	78.0	
2008	74.5	
2009	77.7	
2010	75.3	
2011	70.9	
2012	73.5	
2013	76.0	
2014	78.4	
2015	91.6	91.6
2016	95.9	95.9
2017		95.9
2022		95.9
2027		95.9
2032		95.9
2037		95.9
Compounded Annual Growth Rate		
1990-2015	0.1%	
2015-2037		0.2%

(a) Trade Weighted U.S. Dollar Index against major world currencies. Index where March 1973 = 100.

Sources: Federal Reserve Bank of St. Louis, Federal Reserve Economic Research (FRED) and HNTB analysis.

APPENDIX B: AIR FARES AND YIELD

In addition to local economic factors as noted earlier, passenger originations are also sensitive to airline factors such as air carrier service and fares. Therefore, the critical assumptions for this analysis also include future yield (revenue per passenger mile) and fare levels. The detailed yield and fare analysis is presented in this appendix.

Since the price to the passenger includes taxes and fees, in addition to the base fare reported by the airlines, these taxes and fees were added to the historical data. One of the fastest growing categories is airline ancillary fees (shown in **Table B.1**). **Table B.2** shows historical air fares and yield at SJC, including taxes and fees. As shown in the table, beginning in the early 1990s there was a long-term decline in the real cost of air travel at SJC through the mid-2000's, temporarily interrupted during the dot.com boom. Between the 2008-2009 Great Recession and 2015, SJC air fares increased, reflecting higher fuel costs and increased airline capacity discipline. Fares decreased in 2016 because of lower fuel costs and increased competition.

Table B.3 provides the FAA forecasts of yields and fares, not including taxes and fees. An estimate of FAA fares was derived by multiplying the FAA forecasts of average yield and average trip distance. Since the FAA provides separate forecasts for mainline and regional carriers, these were weighted by FAA forecasted enplanements to generate combined mainline-regional carrier fare projections. As shown in the table, the FAA projects real yield to increase between 2016 and 2024, reflecting an anticipated increase in fuel costs, and then decline again after 2024. Because of increasing trip distance, national fares are projected to decrease at a slower rate than yield.

Table B.4 provides the forecast of air fares and yield for SJC, before the addition of taxes and fees. The projection follows the FAA forecast except for 2017. Because of the announced new domestic service at SJC, and associated competition, it is expected that 2017 air fares will continue to decline at 2015-2016 rates. In recent years, 2011 to 2015, air fares at SJC have been markedly higher than the U.S. average, in contrast to trends before 2011. A continued decline in SJC fares through 2017, will bring SJC fares closer to the U.S. average reflecting the SJC/U.S. fare relationship that predominated before 2010.

The fares and yield in **Table B.5** are similar those in to **Table B.4** but includes taxes and fees. The following assumptions were used to estimate future taxes and fees for SJC:

- Airline excise tax – continues at 7.5 percent of base fare.
- Airline segment tax – increases with rate of inflation
- Security fee – increases from $5.60 per trip at rate of inflation
- PFCs – increase at rate of inflation
- Ancillary fees – Reservation Cancellation Fees and Baggage Fees currently average 5.4 percent of passenger ticket revenues for domestic U.S. carriers. This percentage is assumed to remain constant through the forecast period.

Table B.6 shows historical international air fares (in 2015 dollars) for SJC, SFO, and OAK. Although SJC and OAK indicate significantly lower international fares than SFO, this is largely because SJC and OAK international service has been, historically, more short-haul than SFO. **Table B.7** presents the forecast of Bay Area international air fares, based on the FAA forecast, which is used in the SJC forecast of international originations.

Table B.1 – Airline Ancillary Fees as Percent of Ticket Revenue (U.S. Domestic Carriers)

	Total (thousands of dollars)			Percent		
Year	Passenger Ticket Revenue	Reservation Cancellation Fees	Baggage Fees	Reservation Cancellation Fees	Baggage Fees	Subtotal
1990	45,686,217	42,426	76,129	0.1%	0.2%	0.3%
1991	44,032,884	50,401	78,083	0.1%	0.2%	0.3%
1992	44,876,030	102,111	87,489	0.2%	0.2%	0.4%
1993	48,861,437	150,279	91,557	0.3%	0.2%	0.5%
1994	49,724,067	166,056	98,355	0.3%	0.2%	0.5%
1995	53,224,215	253,398	92,456	0.5%	0.2%	0.6%
1996	58,576,536	298,031	94,291	0.5%	0.2%	0.7%
1997	61,841,988	321,323	98,764	0.5%	0.2%	0.7%
1998	63,990,543	370,548	104,776	0.6%	0.2%	0.7%
1999	67,020,735	385,786	117,712	0.6%	0.2%	0.8%
2000	74,039,610	422,265	122,862	0.6%	0.2%	0.7%
2001	63,625,096	479,012	111,205	0.8%	0.2%	0.9%
2002	57,078,380	530,568	132,154	0.9%	0.2%	1.2%
2003	63,343,124	580,766	200,791	0.9%	0.3%	1.2%
2004	67,441,772	639,902	218,925	0.9%	0.3%	1.3%
2005	71,370,432	753,906	263,332	1.1%	0.4%	1.4%
2006	76,773,844	848,695	340,633	1.1%	0.4%	1.5%
2007	79,111,325	853,805	357,506	1.1%	0.5%	1.5%
2008	80,269,614	1,391,366	902,536	1.7%	1.1%	2.9%
2009	66,455,841	1,784,288	2,336,992	2.7%	3.5%	6.2%
2010	72,931,806	1,685,505	2,949,314	2.3%	4.0%	6.4%
2011	79,818,690	1,713,606	2,909,714	2.1%	3.6%	5.8%
2012	80,020,431	1,610,490	2,691,555	2.0%	3.4%	5.4%
2013	83,389,551	1,788,042	2,600,594	2.1%	3.1%	5.3%
2014	88,660,101	1,868,906	2,748,271	2.1%	3.1%	5.2%
2015	90,196,282	1,926,737	2,979,650	2.1%	3.3%	5.4%

Source: Bureau of Transportation Statistics, Research and Innovative Technology Administration (RITA), 2016

Table B.2 – Historical Average SJC Domestic Fares and Yields Including Airline Fees and Taxes

							Additional Taxes and Fees											
									Security Surcharge (c)		Passenger Facility Charg (per Enplanement)							
Year	Nominal Fare (a)	Nominal Yield (a)	Real Fare (b)	Real Yield (b)	Average Distance (a)	Average Number of Segments (a)	Excise Tax (% of Fare) (c)	Segment Tax (per Enplanement) (c)	(per Enplanement)	(per one-way trip)	SJC (d)	General (e)	Airline Ancillary Fees (percent) (f)	Nominal Fare with Fees (g)	Nominal Yield with Fees (h)	Real Fare with Fees (i)	Real Yield with Fees (j)	GDP Price Deflator (k)
1990	153.58	0.15	249.23	0.237	1051	1.350	8.2%	$ -	$ -		$ -	$ -	0.3%	166.52	15.84	270.23	25.71	1.623
1991	147.12	0.14	231.16	0.215	1070	1.350	10.0%	$ -	$ -		$ -	$ -	0.3%	162.26	15.16	254.95	23.83	1.571
1992	147.32	0.13	225.51	0.194	1159	1.380	10.0%	$ -	$ -		$ 1.00	$ 0.75	0.4%	163.96	14.15	250.98	21.66	1.531
1993	142.67	0.14	213.07	0.203	1046	1.320	10.0%	$ -	$ -		$ 3.00	$ 3.00	0.5%	161.60	15.45	241.35	23.07	1.493
1994	107.60	0.12	157.42	0.176	895	1.260	10.0%	$ -	$ -		$ 3.00	$ 3.00	0.5%	122.71	13.71	179.53	20.06	1.463
1995	110.00	0.13	157.66	0.179	884	1.240	10.0%	$ -	$ -		$ 3.00	$ 3.00	0.6%	125.43	14.19	179.78	20.34	1.433
1996	110.83	0.13	155.54	0.177	877	1.230	3.5%	$ -	$ -		$ 3.00	$ 3.00	0.7%	119.11	13.58	167.16	19.06	1.403
1997	117.56	0.13	162.19	0.177	918	1.230	7.9%	$ 0.25	$ -		$ 3.00	$ 3.00	0.7%	131.69	14.35	181.68	19.79	1.380
1998	123.51	0.13	169.10	0.178	947	1.235	8.8%	$ 1.25	$ -		$ 3.00	$ 3.00	0.7%	140.48	14.84	192.34	20.31	1.369
1999	131.15	0.13	176.96	0.181	974	1.248	7.9%	$ 2.06	$ -		$ 3.00	$ 3.00	0.8%	148.78	15.28	200.75	20.61	1.349
2000	154.83	0.15	203.83	0.197	1035	1.266	7.5%	$ 2.50	$ -		$ 3.00	$ 3.00	0.7%	174.54	16.87	229.78	22.21	1.316
2001	130.81	0.12	168.94	0.155	1085	1.281	7.5%	$ 2.75	$ -		$ 4.13	$ 3.90	0.9%	150.58	13.88	194.48	17.93	1.292
2002	118.39	0.11	150.88	0.140	1078	1.279	7.5%	$ 3.00	$ 2.29		$ 4.50	$ 3.94	1.2%	141.01	13.09	179.71	16.68	1.274
2003	119.24	0.11	149.01	0.132	1130	1.294	7.5%	$ 3.00	$ 1.67		$ 4.50	$ 3.98	1.2%	141.36	12.51	176.66	15.63	1.250
2004	115.12	0.11	140.45	0.128	1092	1.282	7.5%	$ 3.10	$ 2.50		$ 4.50	$ 4.01	1.3%	138.03	12.64	168.40	15.42	1.220
2005	122.08	0.11	144.81	0.134	1080	1.286	7.5%	$ 3.20	$ 2.50		$ 4.50	$ 4.05	1.4%	145.97	13.52	173.15	16.03	1.186
2006	134.64	0.12	155.55	0.141	1100	1.280	7.5%	$ 3.30	$ 2.50		$ 4.50	$ 4.09	1.5%	159.89	14.54	184.73	16.80	1.155
2007	130.90	0.12	147.54	0.136	1080	1.267	7.5%	$ 3.40	$ 2.50		$ 4.50	$ 4.13	1.5%	155.80	14.43	175.60	16.26	1.127
2008	136.26	0.13	149.03	0.137	1085	1.281	7.5%	$ 3.50	$ 2.50		$ 4.50	$ 4.16	2.9%	163.73	15.10	179.07	16.51	1.094
2009	123.00	0.12	134.61	0.126	1064	1.296	7.5%	$ 3.60	$ 2.50		$ 4.50	$ 4.20	6.2%	153.50	14.42	167.99	15.78	1.094
2010	142.01	0.13	152.89	0.138	1104	1.301	7.5%	$ 3.70	$ 2.50		$ 4.50	$ 4.24	6.4%	175.53	15.90	188.98	17.12	1.077
2011	159.73	0.14	167.84	0.150	1115	1.291	7.5%	$ 3.70	$ 2.50		$ 4.50	$ 4.28	5.8%	194.71	17.47	204.60	18.35	1.051
2012	163.71	0.15	168.83	0.150	1127	1.280	7.5%	$ 3.80	$ 2.50		$ 4.50	$ 4.44	5.4%	198.60	17.63	204.81	18.18	1.031
2013	166.94	0.15	169.84	0.153	1106	1.276	7.5%	$ 3.90	$ 2.50		$ 4.50	$ 4.45	5.3%	202.14	18.28	205.65	18.59	1.017
2014	165.06	0.15	165.57	0.152	1086	1.269	7.5%	$ 4.00	$ 1.38	$ 2.50	$ 4.50	$ 4.45	5.2%	201.06	18.52	201.68	18.57	1.003
2015	168.07	0.15	168.07	0.153	1096	1.272	7.5%	$ 4.00		$ 5.60	$ 4.50	$ 4.45	5.4%	206.22	18.81	206.22	18.81	1.000
2016 (l)	160.96	0.15	159.08	0.146	1090	1.272	7.5%	$ 4.00		$ 5.60	$ 4.50	$ 4.45	5.4%	198.19	18.18	196.07	17.99	0.988
									Average Annual Growth Rate									
1990-2000																-1.6%	-1.5%	
2000-2015																-0.7%	-1.1%	
1990-2015																-1.1%	-1.2%	

(a) USDOT Origin-Destination Survey as compiled by DataBase Products.
(b) Nominal fare and yield converted to 2015 dollars.
(c) Historical passenger ticket tax data from Air Transport Association. Values prorated when changes or expirations occurred within calendar year.
(d) Federal Aviation Administration. Values prorated when changes occurred within calendar year.
(e) Federal Aviation Administration. Estimated average of all airports.
(f) Table B.2.
(g) Nominal fares with taxes and fees included.
(h) Nominal yields with taxes and fees included.
(i) Average fares with taxes and fees included converted to 2015 prices.
(j) Average yields with taxes and fees included converted to 2015 prices.
(k) Gross Domestic Product Implicit Price Deflator for Consumer Expenditures from U.S. Bureau of Economic Analysis.
(l) First 3 quarters.

Sources: As noted and HNTB analysis.

Table B.3 – Summary National FAA Forecasts of Yield and Fares (2015 dollars)

	FAA Forecasts (a)											
	US Yield			US Trip Length			US Average Fare (c)			US Enplanements (millions)		
Year	Mainline	Regional	Average (b)	Mainline	Regional	Average (b)	Mainline	Regional	Average (d)	Mainline	Regional	Total
2001	18.19	42.52	19.35	887.0	302.0	812.1	$161.35	$128.41	$157.13	545.00	80.00	625.00
2008	14.48	23.23	15.56	999.0	461.0	873.4	$144.66	$107.09	$135.88	522.00	159.00	681.00
2009	13.24	18.88	13.96	1,003.0	457.0	869.7	$132.80	$86.28	$121.44	477.00	154.00	631.00
2010	13.74	17.14	14.20	1,015.0	464.0	874.4	$139.46	$79.53	$124.17	473.00	162.00	635.00
2011	14.45	16.03	14.66	1,017.0	467.0	879.9	$146.96	$74.86	$128.99	488.00	162.00	650.00
2012	14.59	13.64	14.47	1,017.0	467.0	883.3	$148.38	$63.70	$127.79	495.00	159.00	654.00
2013	14.70	11.88	14.35	1,026.0	469.0	893.8	$150.82	$55.72	$128.25	498.00	155.00	653.00
2014	15.16	11.42	14.71	1,024.0	473.0	897.2	$155.24	$54.02	$131.94	515.00	154.00	669.00
2015	14.73	12.17	14.43	1,023.0	475.0	902.5	$150.69	$57.81	$130.27	543.00	153.00	696.00
2016	14.26	11.78	13.98	1,017.0	474.0	901.8	$145.02	$55.84	$126.11	572.00	154.00	726.00
2017	14.65	12.10	14.36	1,018.0	476.0	902.6	$149.14	$57.60	$129.64	584.00	158.00	742.00
2018	14.66	12.11	14.37	1,021.0	478.0	905.8	$149.68	$57.89	$130.21	598.00	161.00	759.00
2019	14.70	12.14	14.41	1,023.0	480.0	907.5	$150.38	$58.27	$130.80	611.00	165.00	776.00
2020	14.72	12.15	14.43	1,026.0	482.0	910.5	$151.03	$58.56	$131.39	623.00	168.00	791.00
2021	14.73	12.16	14.44	1,028.0	484.0	912.8	$151.42	$58.85	$131.83	633.00	170.00	803.00
2022	14.78	12.20	14.49	1,031.0	486.0	915.3	$152.38	$59.29	$132.62	642.00	173.00	815.00
2023	14.87	12.27	14.58	1,034.0	488.0	918.0	$153.76	$59.88	$133.82	649.00	175.00	824.00
2024	14.91	12.30	14.62	1,036.0	490.0	920.3	$154.47	$60.27	$134.50	658.00	177.00	835.00
2025	14.89	12.28	14.60	1,039.0	491.0	922.7	$154.71	$60.29	$134.67	668.00	180.00	848.00
2026	14.82	12.22	14.53	1,041.0	493.0	924.8	$154.28	$60.24	$134.34	680.00	183.00	863.00
2027	14.73	12.15	14.44	1,044.0	495.0	927.7	$153.78	$60.14	$133.94	692.00	186.00	878.00
2028	14.63	12.07	14.34	1,047.0	497.0	930.4	$153.18	$59.99	$133.42	706.00	190.00	896.00
2029	14.52	11.98	14.23	1,049.0	499.0	932.7	$152.31	$59.78	$132.75	720.00	193.00	913.00
2030	14.40	11.88	14.11	1,052.0	501.0	935.5	$151.49	$59.52	$132.05	735.00	197.00	932.00
2031	14.29	11.79	14.01	1,054.0	503.0	937.5	$150.62	$59.30	$131.32	750.00	201.00	951.00
2032	14.18	11.69	13.90	1,057.0	505.0	939.9	$149.88	$59.03	$130.61	765.00	206.00	971.00
2033	14.08	11.62	13.80	1,060.0	507.0	942.8	$149.25	$58.91	$130.11	781.00	210.00	991.00
2034	13.99	11.54	13.71	1,062.0	509.0	944.9	$148.57	$58.74	$129.56	797.00	214.00	1,011.00
2035	13.90	11.47	13.62	1,065.0	511.0	947.9	$148.04	$58.61	$129.13	813.00	218.00	1,031.00
2036	13.81	11.39	13.53	1,068.0	513.0	950.4	$147.49	$58.43	$128.61	829.00	223.00	1,052.00
2037	*13.71*	*11.31*	*13.44*	*1,071.0*	*515.0*	*953.3*	*$146.83*	*$58.25*	*$128.08*	*845.00*	*227.00*	*1,072.00*

(a) FAA forecast data from FAA Aerospace Forecasts: Fiscal Years 2016-2036.
(b) Average weighted by number of enplanements in each category.
(c) Estimated by multiplying yield by trip length.
(d) Average weighted by number of enplanements in each category.

Sources: As noted and HNTB analysis.

Table B.4 – Projected Average Domestic SJC Fares and Yields Excluding Fees and Taxes

Year	FAA Yield (a)	FAA Fare (a)	SJC Yield (b)	SJC Fare (c)
		Base Case		
2008	0.156	$135.88	0.137	$ 149.03
2009	0.140	$121.44	0.126	$ 134.61
2010	0.142	$124.17	0.138	$ 152.89
2011	0.147	$128.99	0.150	$ 167.84
2012	0.145	$127.79	0.150	$ 168.83
2013	0.143	$128.25	0.153	$ 169.84
2014	0.147	$131.94	0.152	$ 165.57
2015	0.144	$130.27	0.153	$ 168.07
2016 (e)	0.140	$126.11	0.146	$ 159.08
2017	0.144	$129.64	0.139	$ 150.09 (d)
2022	0.145	$132.62	0.140	$ 153.54
2027	0.144	$133.94	0.140	$ 155.07
2032	0.139	$130.61	0.134	$ 151.21
2037	0.134	$128.08	0.130	$ 148.28
		Average Annual Growth Rate		
2015-2037	-0.3%	-0.1%	-0.7%	-0.6%

(a) Table B.3.

(b) Assumed to increase at same rate as adjusted FAA U.S. yield forecast.

(c) Assumed to increase at same rate as adjusted FAA U.S. fare forecast.

(d) 2017 SJC fares assumed to decline from 2016 level at 2015-2016 rate as a result of announced increased competition from air carriers.

(e) First 3 quarters.

Sources: As noted and HNTB analysis.

Table B.5 – Projected Average Domestic SJC Fares and Yields Including Fees and Taxes

Year	Fare Without Fees and Taxes (a)	Yield Without Fees and Taxes (a)	Average Distance (b)	Average Segments (c)	Additional Taxes and Fees: Excise Tax (d) (% of Fare)	Segment Tax (d) (per Enplanement)	Security Surcharge (d)	Passenger Facility Charge (per Enplanement): SJC (d)	Passenger Facility Charge (per Enplanement): General (d)	Airline Ancillary Fees (e): Percent	Airline Ancillary Fees (e): Total	Real Fare w/ Fees (f)	Real Yield w/ Fees (g)
2013	169.84	0.153	1106	1.28	7.5%	$ 3.90		$ 4.50	$ 4.45	5.3%	$ 8.94	202.14	18.59
2014	165.57	0.152	1086	1.27	7.5%	$ 4.00	$ 2.50	$ 4.50	$ 4.45	5.2%	$ 8.62	201.06	18.57
2015	168.07	0.153	1096	1.27	7.5%	$ 4.00	$ 5.60	$ 4.50	$ 4.45	5.4%	$ 9.14	206.22	18.81
2016 (h)	159.08	0.146	1090	1.27	7.5%	$ 4.00	$ 5.60	$ 4.50	$ 4.45	5.4%	$ 8.65	196.07	17.99
2017	150.09	0.139	1091	1.27	7.5%	$ 4.00	$ 5.60	$ 4.50	$ 4.45	5.4%	$ 8.16	185.91	17.04
2022	153.54	0.140	1106	1.27	7.5%	$ 4.00	$ 5.60	$ 4.50	$ 4.45	5.4%	$ 8.35	189.81	17.16
2027	155.07	0.140	1121	1.27	7.5%	$ 4.00	$ 5.60	$ 4.50	$ 4.45	5.4%	$ 8.44	191.54	17.08
2032	151.21	0.134	1136	1.27	7.5%	$ 4.00	$ 5.60	$ 4.50	$ 4.45	5.4%	$ 8.23	187.17	16.48
2037	148.28	0.130	1152	1.27	7.5%	$ 4.00	$ 5.60	$ 4.50	$ 4.45	5.4%	$ 8.07	183.86	15.96

(a) Table B.4.
(b) Assumed to increase at same rate as FAA forecast of average US trip length from Table B.3.
(c) Historical from Table B.3. Assumed to remain constant.
(d) Table B.2. Assumed to remain constant in real dollars.
(e) From Table B.2. Share of base ticket price assumed to remain constant.
(f) SJC Fare with taxes and fees added.
(g) SJC Yield with taxes and fees added.
(h) First 3 quarters.

Sources: As noted and HNTB analysis.

Table B.6 – Historical Bay Area International Air Fares (2015 Dollars Not Including Taxes and Fees)

Year	SJC	SFO	OAK	Bay Area Average
1998	560.14	771.85	466.10	750.96
1999	585.69	749.64	359.47	732.76
2000	643.96	742.84	388.46	728.01
2001	532.86	652.35	340.00	636.57
2002	463.21	610.87	307.74	593.06
2003	426.52	594.35	297.18	571.17
2004	456.49	670.14	304.83	642.64
2005	460.89	651.34	262.14	624.78
2006	448.97	698.15	308.84	669.42
2007	410.07	749.29	306.25	719.81
2008	394.52	783.04	298.68	755.40
2009	271.60	602.78	223.83	586.34
2010	291.87	752.70	158.51	719.45
2011	326.18	766.92	238.53	736.03
2012	332.54	742.87	261.13	718.22
2013	344.44	693.11	260.06	666.73
2014	388.91	712.36	290.61	684.19
2015	364.13	636.05	321.08	611.15
2016 (a)	335.75	596.05	314.83	569.02
Compounded Annual Growth Rate				
1998-2015	-2.5%	-1.1%	-2.2%	-1.2%

(a) First 3 quarters.

Sources: USDOT Origin-Destination Survey as compiled by DataBase Products and HNTB analysis.

Table B.7 – Historical and Projected Bay Area (SJC, SFO, and OAK) International Air Fares (2015 Dollars Not Including Taxes and Fees)

	FAA Projections (a)			
Year	International Trip Length	Yield	FAA Fare	Bay Area Average Fare (b)
2010	2,988	13.98	417.72	719.45
2011	2,993	14.95	447.45	736.03
2012	2,951	15.27	450.62	718.22
2013	2,942	15.09	443.95	666.73
2014	2,917	14.98	436.97	684.19
2015	2,912	14.20	413.50	611.15
2016	2,856	13.57	387.56	569.02
2017	2,868	13.49	386.89	568.04
2018	2,872	13.41	385.14	565.46
2019	2,874	13.33	383.10	562.48
2020	2,874	13.25	380.81	559.10
2021	2,876	13.17	378.77	556.11
2022	2,878	13.09	376.73	553.12
2023	2,879	13.01	374.56	549.93
2024	2,876	12.93	371.87	545.98
2025	2,873	12.85	369.18	542.04
2026	2,870	12.77	366.50	538.10
2027	2,867	12.69	363.82	534.17
2028	2,864	12.61	361.15	530.25
2029	2,860	12.54	358.64	526.57
2030	2,857	12.47	356.27	523.08
2031	2,853	12.40	353.77	519.41
2032	2,850	12.32	351.12	515.52
2033	2,844	12.24	348.11	511.09
2034	2,838	12.16	345.10	506.68
2035	2,831	12.08	341.98	502.11
2036	2,825	12.01	339.28	498.14
2037 (c)	*2,819*	*11.93*	336.31	493.77
Compounded Annual Growth Rate				
2015-2037	0.0%	-0.5%	-0.6%	-0.6%

(a) FAA forecast data from FAA Aerospace Forecasts: Fiscal Years 2016-2036.

(b) Historical data from Table B.7. Assumed to increase at same rate as estimated FAA fare.

(c) Extrapolated.

Sources: As noted and HNTB analysis.

APPENDIX C: HISTORICAL AVIATION ACTIVITY

This appendix supplements Section 3, by providing additional detail on historical aviation activity at SJC.

Tables C.1, C.2, and C.3 present historical domestic and international passenger originations at SJC. Domestic originations at SJC grew very rapidly (8 percent) from 1990 to 2000. They then declined between the peak of the dot.com boom (2000) and 2009 at a -4.1 percent annual rate. Domestic originations have since recovered, growing 3.1 percent annually since 2009. International originations declined between 2001 and 2009, but have increased at a 16.5 percent annual rate since 2009, an increase that is expected to continue into 2017 based on announced new international service additions. The share of Bay Area international originations accounted for by SJC has been as high as 7.7 percent (2000) and as low as 3.3 percent (2009) and has since recovered to 6.7 percent in 2015. For a long time (1998 to 2012) international originations have accounted for between approximately 4 and 5 percent of total SJC originations (see **Table C.3**). By 2016, the international share had increased to almost 9 percent.

Tables C.4, C.5, and C.6 show the recent history of revenue passenger enplanements at SJC and the two other Bay Area airports. The data series begins at 2004; prior to that year the USDOT T100 database did not include many regional carriers and was therefore incomplete. Because of low connecting passenger activity, SJC accounts for a smaller share of Bay Area enplanements than Bay Area originations. Table C.6 also lists total passenger enplanements that include non-revenue enplanements in addition to revenue enplanements.

Table C.7 shows the seasonal distribution of revenue passenger enplanements at SJC. Domestic passenger traffic peaks in the summer. July or August typically account for the highest monthly enplanements. However, June activity is usually slightly higher when evaluated on an average day basis.[5] International passenger enplanements also exhibit a peak in summer, but their highest peak occurs in December, reflecting Mexican winter vacation travel.

Table C.8 presents the changes in airline market share at SJC over the past fifteen years. Southwest Airlines has accounted for the greatest number of originations throughout the period, and currently accounts for about one half of originations at SJC. Other major airlines serving SJC, ranked in order of originations, include Alaska, American/US Airways, Delta, United, and Hawaiian Airlines.

Tables C.9 and C.10 display domestic and international aircraft departures at SJC by equipment type between 2004 and 2015. The domestic regional carrier fleet has gradually transitioned from small turboprops and 50-seat regional jets to large turboprops and 70 to 76-seat regional jets. Narrow-body aircraft account for almost all remaining domestic passenger aircraft departures, except for some Boeing 767 flights to Hawaii. Narrow-body aircraft flying to Mexico accounted for most of international aircraft departures in 2015, but the number of Design Group V aircraft on overseas flights, such as the Boeing 787, is increasing rapidly.

[5] The higher daily numbers in June translate to fewer monthly numbers than July or August because June has fewer days (30 vs. 31).

Table C.11 displays total air cargo tonnage at the thee commercial Bay Area airports. There was a significant decrease in the Bay Area total between 2004 and 2013, reflecting the Great Recession as well as diversion to other transport modes, trucks for domestic cargo and ships for international cargo. Cargo activity has increased moderately in 2014 and 2015. Over the same period, SJC's share of the Bay Area all-cargo market declined.

Table C.12 provides a breakout of SJC air cargo broken out by passenger carrier (belly cargo) and all-cargo carrier. All-cargo carriers, specifically FedEx and UPS, account for most of the domestic tonnage. Conversely, virtually all international air cargo is carried on passenger aircraft. Note the gap in international air cargo between 2007 and 2012 when there was no international wide-body lift capacity available at SJC.

All-cargo departures by aircraft type are listed in **Table C.13**. Currently, most of all-cargo aircraft operations are conducted by wide-body aircraft, mostly Airbus A-300, DC-10, and Boeing 767 aircraft.

Historical general aviation based aircraft at SJC are listed in **Table C.14**. Between 1993 and 2012 there was a 75 percent decline in total based aircraft at the Airport. Examination of FAA Terminal Area Forecast (TAF) historical data indicates that the clear majority of GA aircraft in the early 1990s were single-engine piston aircraft, suggesting that most of the loss was in the single-engine piston category. At the same time, jet aircraft and helicopters have been increasing.

Table C.15 shows total SJC aircraft operations, including a breakout of itinerant and local operations. Although itinerant operations have declined over the historical period, local operations have declined at a much more rapid rate, almost 7 percent per year.

Table C.16 provides a monthly breakout of aircraft operations at SJC. Like passenger enplanements, commercial operations peak in the summer, either July or August. Cargo tends to peak in December, during the Holiday rush. General aviation activity is less consistent, and can peak in the spring, summer or fall. Military operations also show little seasonal consistency. Total operations are most likely to peak in summer, but tend to show a broad seasonal peak extending from May to October.

Table C.1 – Domestic SJC and Bay Area Domestic Passenger Originations

Year	SJC	SFO	OAK	Bay Area Total	Share SJC	Share SFO	Share OAK
1990	2,562,610	9,011,420	2,597,690	14,171,720	18.1%	63.6%	18.3%
1991	2,469,130	9,397,040	2,862,460	14,728,630	16.8%	63.8%	19.4%
1992	2,499,000	9,206,820	2,913,400	14,619,220	17.1%	63.0%	19.9%
1993	2,874,940	9,326,610	3,434,830	15,636,380	18.4%	59.6%	22.0%
1994	3,715,980	9,240,300	3,804,580	16,760,860	22.2%	55.1%	22.7%
1995	4,013,990	9,840,670	4,399,020	18,253,680	22.0%	53.9%	24.1%
1996	4,535,580	10,547,790	4,384,550	19,467,920	23.3%	54.2%	22.5%
1997	4,648,820	11,062,830	4,130,300	19,841,950	23.4%	55.8%	20.8%
1998	4,732,060	11,049,131	4,151,183	19,932,374	23.7%	55.4%	20.8%
1999	5,111,095	11,212,185	4,434,141	20,757,421	24.6%	54.0%	21.4%
2000	5,521,183	11,388,410	4,811,544	21,721,137	25.4%	52.4%	22.2%
2001	5,157,082	8,769,104	5,169,832	19,096,018	27.0%	45.9%	27.1%
2002	4,703,250	7,626,984	5,695,992	18,026,226	26.1%	42.3%	31.6%
2003	4,568,324	7,236,493	6,075,149	17,879,966	25.5%	40.5%	34.0%
2004	4,679,695	7,991,251	6,357,463	19,028,409	24.6%	42.0%	33.4%
2005	4,745,283	8,256,204	6,521,585	19,523,072	24.3%	42.3%	33.4%
2006	4,738,715	8,203,237	6,538,845	19,480,797	24.3%	42.1%	33.6%
2007	4,797,741	8,945,897	6,577,827	20,321,465	23.6%	44.0%	32.4%
2008	4,386,503	9,968,312	5,136,647	19,491,462	22.5%	51.1%	26.4%
2009	3,772,922	10,547,452	4,224,952	18,545,326	20.3%	56.9%	22.8%
2010	3,730,186	10,955,509	4,154,818	18,840,513	19.8%	58.1%	22.1%
2011	3,730,725	11,412,056	4,071,074	19,213,855	19.4%	59.4%	21.2%
2012	3,689,028	12,124,764	4,381,850	20,195,642	18.3%	60.0%	21.7%
2013	3,852,342	12,426,204	4,238,000	20,516,546	18.8%	60.6%	20.7%
2014	4,148,264	13,025,219	4,470,594	21,644,077	19.2%	60.2%	20.7%
2015	4,301,060	13,832,295	4,787,489	22,920,844	18.8%	60.3%	20.9%
2016 (a)	4,674,717	14,559,551	5,125,455	24,359,724	19.2%	59.8%	21.0%
			Compounded Annual Growth Rate				
1990-2000	8.0%	2.4%	6.4%	4.4%	3.5%	-1.9%	1.9%
2000-2009	-4.1%	-0.8%	-1.4%	-1.7%	-2.4%	0.9%	0.3%
2009-2016	3.1%	4.7%	2.8%	4.0%	-0.8%	0.7%	-1.1%
1990-2016	2.3%	1.9%	2.6%	2.1%	0.2%	-0.2%	0.5%

(a) Estimated from first 3 quarters.

Sources: USDOT Origin-Destination Survey as compiled by DataBase Products and HNTB analysis.

Table C.2 – SJC and Bay Area International Passenger Originations

					Share		
Year	SJC	SFO	OAK	Bay Area Total	SJC	SFO	OAK
1998	219,304	2,758,253	55,384	3,032,941	7.2%	90.9%	1.8%
1999	214,098	2,920,358	47,679	3,182,135	6.7%	91.8%	1.5%
2000	238,840	2,782,849	62,484	3,084,173	7.7%	90.2%	2.0%
2001	257,238	3,142,685	77,157	3,477,080	7.4%	90.4%	2.2%
2002	212,138	2,876,380	82,974	3,171,492	6.7%	90.7%	2.6%
2003	215,039	2,921,121	133,616	3,269,776	6.6%	89.3%	4.1%
2004	219,788	3,142,835	134,766	3,497,389	6.3%	89.9%	3.9%
2005	229,366	3,744,268	170,600	4,144,234	5.5%	90.3%	4.1%
2006	237,888	3,817,985	158,792	4,214,665	5.6%	90.6%	3.8%
2007	202,366	3,956,210	130,445	4,289,021	4.7%	92.2%	3.0%
2008	197,214	4,602,767	122,758	4,922,739	4.0%	93.5%	2.5%
2009	151,944	4,447,454	69,761	4,669,159	3.3%	95.3%	1.5%
2010	169,574	4,460,757	135,126	4,765,457	3.6%	93.6%	2.8%
2011	182,296	4,275,284	115,271	4,572,851	4.0%	93.5%	2.5%
2012	185,769	4,587,835	90,696	4,864,300	3.8%	94.3%	1.9%
2013	252,847	4,666,947	102,461	5,022,255	5.0%	92.9%	2.0%
2014	280,390	4,774,844	131,403	5,186,637	5.4%	92.1%	2.5%
2015	314,723	5,423,665	198,053	5,936,441	5.3%	91.4%	3.3%
2016 (a)	443,857	5,935,484	259,483	6,638,825	6.7%	89.4%	3.9%
			Compounded Annual Growth Rate				
1998-2009	-3.3%	4.4%	2.1%	4.0%	-7.0%	0.4%	-1.8%
2009-2016	16.5%	4.2%	20.6%	5.2%	10.8%	-0.9%	14.7%
1998-2016	4.0%	4.3%	9.0%	4.4%	-0.4%	-0.1%	4.3%

(a) Estimated from first 3 quarters.
Note: Foreign Flag international originations are estimated by DataBase Products.

Sources: USDOT Origin-Destination Survey as compiled by DataBase Products and HNTB analysis.

Table C.3 – SJC Domestic and International Passenger Originations

		International				Share		
Year	Domestic	Direct	Connecting via other Gateway	Subtotal International	Total	Domestic	International	Total
1998	4,732,060	120,094	99,210	219,304	4,951,364	95.6%	4.4%	100.0%
1999	5,111,095	104,155	109,943	214,098	5,325,193	96.0%	4.0%	100.0%
2000	5,521,183	93,779	145,061	238,840	5,760,023	95.9%	4.1%	100.0%
2001	5,157,082	118,936	138,302	257,238	5,414,320	95.2%	4.8%	100.0%
2002	4,703,250	81,853	130,285	212,138	4,915,388	95.7%	4.3%	100.0%
2003	4,568,324	98,808	116,231	215,039	4,783,363	95.5%	4.5%	100.0%
2004	4,679,695	94,131	125,657	219,788	4,899,483	95.5%	4.5%	100.0%
2005	4,745,283	108,548	120,818	229,366	4,974,649	95.4%	4.6%	100.0%
2006	4,738,715	111,153	126,735	237,888	4,976,603	95.2%	4.8%	100.0%
2007	4,797,741	78,162	124,204	202,366	5,000,107	96.0%	4.0%	100.0%
2008	4,386,503	65,078	132,136	197,214	4,583,717	95.7%	4.3%	100.0%
2009	3,772,922	57,657	94,287	151,944	3,924,866	96.1%	3.9%	100.0%
2010	3,730,186	65,002	104,572	169,574	3,899,760	95.7%	4.3%	100.0%
2011	3,730,725	78,914	103,382	182,296	3,913,021	95.3%	4.7%	100.0%
2012	3,689,028	81,948	103,821	185,769	3,874,797	95.2%	4.8%	100.0%
2013	3,852,342	135,296	117,551	252,847	4,105,189	93.8%	6.2%	100.0%
2014	4,148,264	149,301	131,089	280,390	4,428,654	93.7%	6.3%	100.0%
2015	4,301,060	178,551	136,172	314,723	4,615,783	93.2%	6.8%	100.0%
2016 (a)	4,674,717	309,390	134,467	443,857	5,118,574	91.3%	8.7%	100.0%
				Compounded Annual Growth Rate				
1998-2009	-2.0%	-6.5%	-0.5%	-3.3%	-2.1%	0.1%	-1.2%	
2009-2016	3.1%	27.1%	5.2%	16.5%	3.9%	-0.7%	12.2%	
1998-2016	-0.1%	5.4%	1.7%	4.0%	0.2%	-0.3%	3.8%	

(a) Estimated from first 3 quarters.

Sources: Tables C.1 and C.2 and HNTB analysis.

Table C.4 – SJC and Bay Area Domestic Passenger Enplanements

					Share		
Year	SJC	SFO	OAK	Bay Area Total	SJC	SFO	OAK
2004	5,126,851	11,986,757	6,761,512	23,875,120	21.5%	50.2%	28.3%
2005	5,169,117	12,175,542	6,910,711	24,255,370	21.3%	50.2%	28.5%
2006	5,145,784	12,184,614	6,977,028	24,307,426	21.2%	50.1%	28.7%
2007	5,172,792	13,024,446	7,063,409	25,260,647	20.5%	51.6%	28.0%
2008	4,699,674	13,937,294	5,490,740	24,127,708	19.5%	57.8%	22.8%
2009	4,039,598	14,510,201	4,564,804	23,114,603	17.5%	62.8%	19.7%
2010	3,985,857	15,154,881	4,563,400	23,704,138	16.8%	63.9%	19.3%
2011	4,020,075	15,721,282	4,449,893	24,191,250	16.6%	65.0%	18.4%
2012	3,990,574	16,745,854	4,850,060	25,586,488	15.6%	65.4%	19.0%
2013	4,162,531	16,972,455	4,691,330	25,826,316	16.1%	65.7%	18.2%
2014	4,455,301	17,752,188	4,971,476	27,178,965	16.4%	65.3%	18.3%
2015	4,624,709	18,790,271	5,359,040	28,774,020	16.1%	65.3%	18.6%
			Compounded Annual Growth Rate				
2004-2009	-4.7%	3.9%	-7.6%	-0.6%	-4.0%	4.6%	-7.0%
2009-2015	2.3%	4.4%	2.7%	3.7%	-1.4%	0.7%	-1.0%
2004-2015	-0.9%	4.2%	-2.1%	1.7%	-2.6%	2.4%	-3.7%

Sources: USDOT T100 data as compiled by DataBase Products and HNTB analysis.

Table C.5 – SJC and Bay Area International Passenger Enplanements

					Share		
Year	SJC	SFO	OAK	Bay Area Total	SJC	SFO	OAK
2004	136,624	3,617,169	160,734	3,914,527	3.5%	92.4%	4.1%
2005	140,529	3,893,483	159,512	4,193,524	3.4%	92.8%	3.8%
2006	135,322	4,054,795	98,981	4,289,098	3.2%	94.5%	2.3%
2007	79,191	4,252,896	79,617	4,411,704	1.8%	96.4%	1.8%
2008	66,341	4,157,691	77,041	4,301,073	1.5%	96.7%	1.8%
2009	58,366	3,943,068	79,072	4,080,506	1.4%	96.6%	1.9%
2010	66,096	4,186,495	108,546	4,361,137	1.5%	96.0%	2.5%
2011	83,429	4,334,921	97,271	4,515,621	1.8%	96.0%	2.2%
2012	84,129	4,557,120	71,440	4,712,689	1.8%	96.7%	1.5%
2013	146,091	4,729,009	78,518	4,953,618	2.9%	95.5%	1.6%
2014	163,613	5,001,467	96,458	5,261,538	3.1%	95.1%	1.8%
2015	192,681	5,444,732	157,182	5,794,595	3.3%	94.0%	2.7%
			Compounded Annual Growth Rate				
2000-2009	-15.6%	1.7%	-13.2%	0.8%	-16.3%	0.9%	-13.9%
2009-2015	22.0%	5.5%	12.1%	6.0%	15.1%	-0.5%	5.8%
1990-2015	3.2%	3.8%	-0.2%	3.6%	-0.4%	0.2%	-3.7%

Sources: USDOT T100 data as compiled by DataBase Products and HNTB analysis.

Table C.6 – SJC Domestic and International Passenger Enplanements

Year	Domestic	International	Total	Share Domestic	Share International	Share Total
Total Revenue Enplanements						
2004	5,126,851	136,624	5,263,475	97.4%	2.6%	100.0%
2005	5,169,117	140,529	5,309,646	97.4%	2.6%	100.0%
2006	5,145,784	135,322	5,281,106	97.4%	2.6%	100.0%
2007	5,172,792	79,191	5,251,983	98.5%	1.5%	100.0%
2008	4,699,674	66,341	4,766,015	98.6%	1.4%	100.0%
2009	4,039,598	58,366	4,097,964	98.6%	1.4%	100.0%
2010	3,985,857	66,096	4,051,953	98.4%	1.6%	100.0%
2011	4,020,075	83,429	4,103,504	98.0%	2.0%	100.0%
2012	3,990,574	84,129	4,074,703	97.9%	2.1%	100.0%
2013	4,162,531	146,091	4,308,622	96.6%	3.4%	100.0%
2014	4,455,301	163,613	4,618,914	96.5%	3.5%	100.0%
2015	4,624,709	192,681	4,817,390	96.0%	4.0%	100.0%
2016 (a)	4,975,911	324,269	5,300,179	93.9%	6.1%	100.0%
Compounded Annual Growth Rate						
1998-2009	-4.7%	-15.6%	-4.9%	0.2%	-11.3%	
2009-2016	3.0%	27.8%	3.7%	-0.7%	23.1%	
1998-2016	-0.2%	7.5%	0.1%	-0.3%	7.4%	
Total Enplanements (Including Non-revenue) (b)						
2004	5,231,717	116,231	5,347,948	97.8%	2.2%	100.0%
2005	5,266,297	102,499	5,368,796	98.1%	1.9%	100.0%
2006	5,231,695	114,787	5,346,482	97.9%	2.1%	100.0%
2007	5,246,192	74,540	5,320,732	98.6%	1.4%	100.0%
2008	4,780,211	65,997	4,846,208	98.6%	1.4%	100.0%
2009	4,093,065	56,238	4,149,303	98.6%	1.4%	100.0%
2010	4,050,541	69,995	4,120,536	98.3%	1.7%	100.0%
2011	4,091,713	84,141	4,175,854	98.0%	2.0%	100.0%
2012	4,056,392	86,533	4,142,925	97.9%	2.1%	100.0%
2013	4,228,649	148,406	4,377,055	96.6%	3.4%	100.0%
2014	4,515,331	164,513	4,679,844	96.5%	3.5%	100.0%
2015	4,686,803	198,887	4,885,690	95.9%	4.1%	100.0%
2016	5,042,720	334,713	5,377,433	93.8%	6.2%	100.0%
Compounded Annual Growth Rate						
1998-2009	-4.8%	-13.5%	-4.9%	0.2%	-9.0%	
2009-2016	3.0%	29.0%	3.8%	-0.7%	24.3%	
1998-2016	-0.3%	9.2%	0.0%	-0.4%	9.2%	

(a) Extrapolated.
(b) Connecting enplanements included with domestic.

Sources: San Jose International Airport, Tables C.4 and C.5 and HNTB analysis.

Table C.7 – SJC Revenue Passenger Enplanement Distribution by Month

	2011	2012	2013	2014	2015	2016	Average Distribution (2011-2015)
			Domestic				
January	294,064	283,127	281,016	303,319	315,921	335,224	7.0%
February	284,610	277,229	280,265	302,736	311,841	338,522	6.9%
March	335,757	322,805	334,310	350,781	360,369	397,893	8.0%
April	334,338	326,856	341,262	358,407	379,739	393,743	8.2%
May	341,093	335,259	368,826	377,135	393,904	418,063	8.5%
June	368,128	366,398	377,738	411,526	424,459	463,949	9.2%
July	366,573	368,119	381,188	**417,017**	**429,855**	452,215	9.2%
August	**368,988**	**375,773**	**389,340**	415,736	423,310		**9.3%**
September	331,707	324,514	338,575	375,262	388,570		8.3%
October	331,664	343,527	358,061	388,755	412,451		8.6%
November	329,246	340,024	342,135	372,256	389,588		8.3%
December	333,907	326,943	369,815	382,371	394,702		8.5%
	4,020,075	3,990,574	4,162,531	4,455,301	4,624,709		100.0%
			International				
January	6,927	7,271	10,759	14,839	13,939	18,398	8.0%
February	5,689	3,933	8,891	11,637	11,011	15,738	6.1%
March	6,313	6,762	10,343	10,708	13,719	18,380	7.1%
April	7,674	6,781	9,792	12,720	13,680	17,102	7.5%
May	7,128	6,646	10,666	13,227	15,116		7.8%
June	8,391	7,518	14,225	16,585	20,185		9.9%
July	7,629	8,853	14,117	17,060	19,725		10.0%
August	6,410	7,332	13,394	14,354	18,021		8.8%
September	6,026	5,813	10,973	10,503	15,160		7.2%
October	6,415	5,909	11,746	10,929	17,132		7.7%
November	6,285	6,623	13,937	13,449	16,601		8.5%
December	**8,542**	**10,688**	**17,248**	**17,602**	**21,409**		**11.2%**
	83,429	84,129	146,091	163,613	195,698		100.0%
			Total				
January	300,991	290,398	291,775	318,158	329,860	353,622	7.0%
February	290,299	281,162	289,156	314,373	322,852	354,260	6.8%
March	342,070	329,567	344,653	361,489	374,088	416,273	8.0%
April	342,012	333,637	351,054	371,127	393,419	410,845	8.2%
May	348,221	341,905	379,492	390,362	409,020		8.5%
June	**376,519**	373,916	391,963	428,111	444,644		9.2%
July	374,202	376,972	395,305	**434,077**	**449,580**		9.3%
August	375,398	**383,105**	**402,734**	430,090	441,331		**9.3%**
September	337,733	330,327	349,548	385,765	403,730		8.2%
October	338,079	349,436	369,807	399,684	429,583		8.6%
November	335,531	346,647	356,072	385,705	406,189		8.3%
December	342,449	337,631	387,063	399,973	416,111		8.6%
	4,103,504	4,074,703	4,308,622	4,618,914	4,820,407		100.0%

Sources: USDOT T100 data as compiled by DataBase Products and HNTB analysis.

Table C.8 – SJC Originations by Airline

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Total																
Alaska Airlines	520,355	479,901	475,138	460,983	450,363	407,355	385,573	385,757	345,898	291,902	406,801	480,331	567,492	627,891	642,521	686,281
All Nippon Airways (ANA)	-	-	-	-	-	-	-	-	-	-	-	-	-	19,802	39,889	42,155
Alliance Airlines	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
America West Airlines	276,882	258,728	235,290	256,133	293,017	317,767	269,157	56,259	-	-	-	-	-	-	-	
American Airlines	1,612,742	1,501,971	1,341,968	1,103,873	1,113,382	977,198	924,468	833,552	679,629	560,436	432,487	415,901	363,279	385,103	377,569	473,584
American Trans Air	-	-	17,522	86,889	20,023	442	959	2,571	60	-	-	-	-	-	-	
Compania Mexicana De Aviaci	51,447	56,261	46,282	60,890	58,435	75,317	83,367	68,024	86,063	68,849	43,650	-	-	-	-	
Continental Air Lines	162,681	166,709	129,567	127,302	139,430	150,773	160,453	168,141	153,620	130,688	127,686	104,923	-	-	-	
Delta Air Lines	267,037	274,372	208,673	203,254	211,019	238,710	234,300	215,908	183,709	153,507	240,196	240,960	220,903	262,891	386,828	476,141
Frontier Airlines	-	-	10,411	56,742	76,296	98,348	101,127	110,853	117,217	89,452	18,230	-	-	-	-	
Hainan Airlines	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15,577
Hawaiian Airlines	-	-	-	-	9	20,729	79,971	82,606	77,949	75,726	76,279	82,535	117,985	112,543	128,558	159,755
Independence Air	-	-	-	-	-	13,052	-	-	-	-	-	-	-	-	-	
JetBlue Airways	-	-	-	-	26,769	108,268	124,301	110,941	144,484	124,066	70,261	79,563	74,217	71,708	70,125	70,609
Northwest Airlines	112,841	139,214	173,695	135,324	111,896	97,875	90,597	88,901	88,232	80,366	-	-	-	-	-	
Southwest Airlines	1,958,423	1,819,067	1,773,108	1,805,250	1,896,365	1,996,062	2,009,659	2,161,310	2,065,523	1,902,325	2,037,042	2,066,104	2,045,374	2,095,657	2,251,826	2,346,197
TWA	105,624	83,281	-	-	-	-	-	-	-	-	-	-	-	-	-	
United Air Lines	658,438	577,402	422,528	404,647	424,933	404,678	463,769	449,391	340,564	230,406	248,582	221,630	258,041	232,453	213,906	178,560
US Airways	-	-	-	7,135	9,060	5,897	42,974	249,573	286,349	212,275	163,101	165,660	170,774	172,372	217,137	108,493
Virgin America	-	-	-	-	-	-	-	-	-	-	-	-	-	64,819	38,026	318
Volaris	-	-	-	-	-	-	-	-	-	-	31,046	49,802	47,754	50,300	50,339	53,474
Other	31,553	55,413	79,204	72,938	66,482	60,173	3,922	14,313	12,412	2,859	2,389	3,601	6,966	7,637	9,916	4,639
Total	5,760,023	5,414,320	4,915,388	4,783,363	4,899,483	4,974,649	4,976,603	5,000,107	4,583,717	3,924,866	3,899,760	3,913,021	3,874,797	4,105,189	4,428,654	4,615,783
Percent																
Alaska Airlines	9.0%	8.9%	9.7%	9.6%	9.2%	8.2%	7.7%	7.7%	7.5%	7.4%	10.4%	12.3%	14.6%	15.3%	14.5%	14.9%
All Nippon Airways (ANA)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.5%	0.9%	0.9%
Alliance Airlines	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
America West Airlines	4.8%	4.8%	4.8%	5.4%	6.0%	6.4%	5.4%	1.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
American Airlines	28.0%	27.7%	27.3%	23.1%	22.7%	19.6%	18.6%	16.7%	14.8%	14.3%	11.1%	10.6%	9.4%	9.4%	8.5%	10.3%
American Trans Air	0.0%	0.0%	0.4%	1.8%	0.4%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Compania Mexicana De Aviaci	0.9%	1.0%	0.9%	1.3%	1.2%	1.5%	1.7%	1.4%	1.9%	1.8%	1.1%	0.0%	0.0%	0.0%	0.0%	0.0%
Continental Air Lines	2.8%	3.1%	2.6%	2.7%	2.8%	3.0%	3.2%	3.4%	3.4%	3.3%	3.3%	2.7%	0.0%	0.0%	0.0%	0.0%
Delta Air Lines	4.6%	5.1%	4.2%	4.2%	4.3%	4.8%	4.7%	4.3%	4.0%	3.9%	6.2%	6.2%	5.7%	6.4%	8.7%	10.3%
Frontier Airlines	0.0%	0.0%	0.2%	1.2%	1.6%	2.0%	2.0%	2.2%	2.6%	2.3%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%
Hainan Airlines	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.3%
Hawaiian Airlines	0.0%	0.0%	0.0%	0.0%	0.0%	0.4%	1.6%	1.7%	1.7%	1.9%	2.0%	2.1%	3.0%	2.7%	2.9%	3.5%
Independence Air	0.0%	0.0%	0.0%	0.0%	0.0%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
JetBlue Airways	0.0%	0.0%	0.0%	0.0%	0.5%	2.2%	2.5%	2.2%	3.2%	3.2%	1.8%	2.0%	1.9%	1.7%	1.6%	1.5%
Northwest Airlines	2.0%	2.6%	3.5%	2.8%	2.3%	2.0%	1.8%	1.8%	1.9%	2.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Southwest Airlines	34.0%	33.6%	36.1%	37.7%	38.7%	40.1%	40.4%	43.2%	45.1%	48.5%	52.2%	52.8%	52.8%	51.0%	50.8%	50.8%
TWA	1.8%	1.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
United Air Lines	11.4%	10.7%	8.6%	8.5%	8.7%	8.1%	9.3%	9.0%	7.4%	5.9%	6.4%	5.7%	6.7%	5.7%	4.8%	3.9%
US Airways	0.0%	0.0%	0.0%	0.1%	0.2%	0.1%	0.9%	5.0%	6.2%	5.4%	4.2%	4.2%	4.4%	4.2%	4.9%	2.4%
Virgin America	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.6%	0.9%	0.0%
Volaris	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.8%	1.3%	1.2%	1.2%	1.1%	1.2%
Other	0.5%	1.0%	1.6%	1.5%	1.4%	1.2%	0.1%	0.3%	0.3%	0.1%	0.1%	0.1%	0.2%	0.2%	0.2%	0.1%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Sources: USDOT Origin-Destination Survey as compiled by DataBase Products and HNTB analysis.

Table C.9 – SJC Scheduled Domestic Passenger Aircraft Departures by Equipment Type

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Regional												
EMBRAER EMB-120 BRASILIA	1,259	1,230	1,227	1,517	1,351	1,182	654	70	141	22	13	2
SAAB-FAIRCHILD 340/B	92	60	17	7	1							
DEHAVILLAND DHC8-400 DASH-8	220	322	691	1,018	711	705	2,009	2,770	3,055	2,936	1,755	1,653
CANADAIR RJ-200ER /RJ-440	2,833	2,858	2,652	2,324	1,924	1,083	1,371	1,575	1,564	2,543	2,232	1,728
CANADAIR RJ-700	1,684	1,817	1,023	775	1,209	2,605	2,043	1,125	1,216	2,082	2,238	1,850
CANADAIR RJ-900		56	152	387	368	416	340	246	436	685	2,843	2,818
EMBRAER-135				122								1
EMBRAER-140	8,952	8,792	9,140	8,308	6,099	5,210	2,133	2,063	1,580			
EMBRAER-145				609	429							
EMBRAER 170				60	1	1	2					20
EMBRAER-175											44	1,218
Narrow-body												
EMBRAER 190				1	263	676	116	3	2			
AIRBUS INDUSTRIE A-318	288	172	400	475	602	606	1					
AIRBUS INDUSTRIE A319	3,266	2,815	2,424	2,644	1,932	2,067	1,458	1,715	1,647	2,000	1,433	935
AIRBUS INDUSTRIE A320-100/200	3,093	3,451	3,792	3,232	2,489	1,599	1,301	1,564	1,264	2,306	2,165	2,065
AIRBUS INDUSTRIE A321				1		1	1	2		2	7	57
BOEING 717-200												444
BOEING 737-100/200	154											
BOEING 737-300	16,894	16,148	15,624	14,423	10,410	8,068	7,057	6,031	5,529	4,603	4,581	4,510
BOEING 737-400	1,691	1,099	1,471	1,053	956	822	514	511	424	427	905	1,331
BOEING 737-500	3,201	445	401	717	1,060	752	1,021	667	397	37	14	1
BOEING 737-700/700LR	8,786	12,096	12,581	15,138	19,493	18,341	17,695	17,375	17,580	18,338	17,219	17,547
BOEING 737-800	2,939	2,303	1,648	1,590	1,913	1,756	2,989	4,004	4,090	4,430	4,785	4,635
BOEING 737-900	220	507	537	645	279	237	192	129	311	407	1,175	597
BOEING 737-900ER												338
BOEING 757-200	2,934	1,365	1,113	1,637	946	685	549	504	377	268	208	188
BOEING 757-300			1		1					1	19	18
MCDONNELL DOUGLAS MD-80	6,710	6,689	6,568	5,407	4,651	3,290	2,262	1,966	1,615	1,366	1,708	1,630
MCDONNELL DOUGLAS MD-90			207	396	314	66	359	613	517	460	320	469
Widebody												
BOEING 767-200/200ER	7		1	1	2	1	2	1	2			
BOEING 767-300/300ER	14	94	367	367	366	336	340	365	534	519	597	726
BOEING 777-200/200LR			1						1			
BOEING 747-400							2	1		1	1	
Total Regional	15,040	15,135	14,902	15,127	12,093	11,202	8,552	7,849	7,992	8,268	9,125	9,290
Total Narrow-body	50,176	47,090	46,767	47,359	45,309	38,966	35,515	35,084	33,753	34,645	34,539	34,765
Total Wide-body	21	94	369	368	368	337	344	367	537	520	598	726
Total	65,237	62,319	62,038	62,854	57,770	50,505	44,411	43,300	42,282	43,433	44,262	44,781
Percent Regional	23.1%	24.3%	24.0%	24.1%	20.9%	22.2%	19.3%	18.1%	18.9%	19.0%	20.6%	20.7%
Percent Narrow-body	76.9%	75.6%	75.4%	75.3%	78.4%	77.2%	80.0%	81.0%	79.8%	79.8%	78.0%	77.6%
Percent Wide-body	0.0%	0.2%	0.6%	0.6%	0.6%	0.7%	0.8%	0.8%	1.3%	1.2%	1.4%	1.6%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Sources: USDOT T100 data as compiled by DataBase Products and HNTB analysis.

Table C.10 – SJC Scheduled International Passenger Aircraft Departures by Equipment Type

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Regional												
EMBRAER 170				43	6							
Narrow-body												
AIRBUS INDUSTRIE A-318		26	135	77	78	69	34					
AIRBUS INDUSTRIE A319	2	4	47	205	51	222	399	436	346	172	8	1
AIRBUS INDUSTRIE A320-100/200	30	321	639	580	564	292	149	29	35	208	370	380
BOEING 737-400	32							9	58	145	130	181
BOEING 737-700/700LR	52							38	51	70	47	59
BOEING 737-800					1	1	22	261	212	397	310	373
BOEING737-900	1							8	2	51	71	16
BOEING 737-900ER												18
BOEING 757-200	505	269	14									
MCDONNELL DOUGLAS MD-80	88	8										
Widebody												
BOEING 787-800 DREAMLINER										203	364	455
B787-900 DREAMLINER												15
BOEING 777-200/200LR	364	366	296							4		
Total Regional	-	-	-	43	6	-	-	-	-	-	-	-
Total Narrow-body	710	628	835	862	694	584	604	781	704	1,043	936	1,028
Total Wide-body	364	366	296	-	-	-	-	-	-	207	364	470
Total	1,074	994	1,131	905	700	584	604	781	704	1,250	1,300	1,498
Percent Regional	0.0%	0.0%	0.0%	4.8%	0.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Percent Narrow-body	66.1%	63.2%	73.8%	95.2%	99.1%	100.0%	100.0%	100.0%	100.0%	83.4%	72.0%	68.6%
Percent Wide-body	33.9%	36.8%	26.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	16.6%	28.0%	31.4%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Sources: USDOT T100 data as compiled by DataBase Products and HNTB analysis.

Table C.11 – Enplaned and Deplaned Air Cargo Tonnage at Bay Area Airports (Short Tons)

	SJC			SFO			OAK			Bay Area Total		
Year	Enplaned	Deplaned	Total	Enplaned	Deplaned	Total	Enplaned	Deplaned	Total	Enplaned	Deplaned	Total
Total Tonnage												
2004	56,718	64,180	120,898	319,832	298,220	618,052	370,643	351,673	722,316	747,193	714,073	1,461,266
2005	53,308	54,596	107,904	312,577	298,282	610,859	374,210	367,422	741,632	740,095	720,300	1,460,395
2006	50,982	52,419	103,401	303,189	308,620	611,809	375,380	364,315	739,695	729,551	725,354	1,454,905
2007	47,866	47,412	95,278	294,440	290,741	585,181	368,982	356,225	725,207	711,288	694,378	1,405,666
2008	41,025	43,698	84,723	264,543	239,757	504,300	319,382	301,247	620,629	624,950	584,702	1,209,652
2009	33,034	36,056	69,090	229,788	207,642	437,430	273,887	261,193	535,080	536,709	504,891	1,041,600
2010	29,147	34,154	63,301	233,072	211,085	444,157	281,347	272,464	553,811	543,566	517,703	1,061,269
2011	25,866	31,193	57,059	220,616	195,595	416,211	273,588	258,256	531,844	520,070	485,044	1,005,114
2012	23,517	28,435	51,952	213,192	196,514	409,706	274,413	264,746	539,159	511,122	489,695	1,000,817
2013	25,052	30,199	55,251	185,824	182,155	367,979	282,877	279,120	561,997	493,753	491,474	985,227
2014	25,868	31,583	57,451	194,912	211,568	406,480	298,413	289,944	588,357	519,193	533,095	1,052,288
2015	25,534	29,802	55,336	219,148	254,280	473,428	300,510	289,014	589,524	545,192	573,096	1,118,288
Compounded Annual Growth Rate												
2004-2015	-7.0%	-6.7%	-6.9%	-3.4%	-1.4%	-2.4%	-1.9%	-1.8%	-1.8%	-2.8%	-2.0%	-2.4%
Share of Bay Area Tonnage												
2004	7.6%	9.0%	8.3%	42.8%	41.8%	42.3%	49.6%	49.2%	49.4%	100%	100%	100%
2005	7.2%	7.6%	7.4%	42.2%	41.4%	41.8%	50.6%	51.0%	50.8%	100%	100%	100%
2006	7.0%	7.2%	7.1%	41.6%	42.5%	42.1%	51.5%	50.2%	50.8%	100%	100%	100%
2007	6.7%	6.8%	6.8%	41.4%	41.9%	41.6%	51.9%	51.3%	51.6%	100%	100%	100%
2008	6.6%	7.5%	7.0%	42.3%	41.0%	41.7%	51.1%	51.5%	51.3%	100%	100%	100%
2009	6.2%	7.1%	6.6%	42.8%	41.1%	42.0%	51.0%	51.7%	51.4%	100%	100%	100%
2010	5.4%	6.6%	6.0%	42.9%	40.8%	41.9%	51.8%	52.6%	52.2%	100%	100%	100%
2011	5.0%	6.4%	5.7%	42.4%	40.3%	41.4%	52.6%	53.2%	52.9%	100%	100%	100%
2012	4.6%	5.8%	5.2%	41.7%	40.1%	40.9%	53.7%	54.1%	53.9%	100%	100%	100%
2013	5.1%	6.1%	5.6%	37.6%	37.1%	37.3%	57.3%	56.8%	57.0%	100%	100%	100%
2014	5.0%	5.9%	5.5%	37.5%	39.7%	38.6%	57.5%	54.4%	55.9%	100%	100%	100%
2015	4.7%	5.2%	4.9%	40.2%	44.4%	42.3%	55.1%	50.4%	52.7%	100%	100%	100%

Sources: USDOT T100 data as compiled by DataBase Products and HNTB analysis.

Table C.12 – SJC Historical Air Cargo (Short Tons)

	Belly			All-Cargo			Total		
Year	Enplaned	Deplaned	Total	Enplaned	Deplaned	Total	Enplaned	Deplaned	Total
				Domestic					
2004	4,660	5,378	10,038	48,960	54,164	103,124	53,620	59,542	113,162
2005	3,945	4,878	8,823	46,073	45,660	91,733	50,018	50,538	100,556
2006	3,617	4,159	7,776	45,761	45,083	90,844	49,378	49,242	98,620
2007	3,058	2,888	5,946	44,806	44,511	89,317	47,864	47,399	95,263
2008	2,726	2,477	5,203	38,299	41,221	79,520	41,025	43,698	84,723
2009	1,588	1,909	3,497	31,446	34,136	65,582	33,034	36,045	69,079
2010	1,392	1,606	2,998	27,751	32,547	60,298	29,143	34,153	63,296
2011	1,377	1,384	2,761	24,477	29,795	54,272	25,854	31,179	57,033
2012	1,816	1,287	3,103	21,682	27,148	48,830	23,498	28,435	51,933
2013	3,203	1,080	4,283	21,268	26,353	47,621	24,471	27,433	51,904
2014	2,951	1,276	4,227	21,652	25,478	47,130	24,603	26,754	51,357
2015	2,472	1,413	3,885	21,356	22,490	43,846	23,828	23,903	47,731
2016 (a)	2,669	1,526	4,195	21,332	22,465	43,797	24,002	23,991	47,992
				Compounded Annual Growth Rate					
2004-2016	-4.5%	-11.4%	-8.3%	-6.7%	-7.1%	-6.9%	-6.5%	-7.3%	-6.9%
				International					
2004	3,095	4,638	7,733	3	-	3	3,098	4,638	7,736
2005	3,286	4,052	7,338	4	6	10	3,290	4,058	7,348
2006	1,604	3,177	4,781	-	-	-	1,604	3,177	4,781
2007	1	1	2	1	12	13	2	13	15
2008	-	-	-	-	-	-	-	-	-
2009	-	-	-	-	11	11	-	11	11
2010	4	1	5	-	-	-	4	1	5
2011	12	14	26	-	-	-	12	14	26
2012	11	-	11	8	-	8	19	-	19
2013	581	2,766	3,347	-	-	-	581	2,766	3,347
2014	1,265	4,829	6,094	-	-	-	1,265	4,829	6,094
2015	1,706	5,899	7,605	-	-	-	1,706	5,899	7,605
2016 (a)	2,768	9,571	12,339	10	19	29	2,778	9,590	12,368
				Compounded Annual Growth Rate					
2004-2016	-0.9%	2.2%	-0.2%	10.9%	-	20.8%	-0.9%	6.2%	4.0%
				Total					
2004	7,755	10,016	17,771	48,963	54,164	103,127	56,718	64,180	120,898
2005	7,231	8,930	16,161	46,077	45,666	91,743	53,308	54,596	107,904
2006	5,221	7,336	12,557	45,761	45,083	90,844	50,982	52,419	103,401
2007	3,059	2,889	5,948	44,807	44,523	89,330	47,866	47,412	95,278
2008	2,726	2,477	5,203	38,299	41,221	79,520	41,025	43,698	84,723
2009	1,588	1,909	3,497	31,446	34,147	65,593	33,034	36,056	69,090
2010	1,396	1,607	3,003	27,751	32,547	60,298	29,147	34,154	63,301
2011	1,389	1,398	2,787	24,477	29,795	54,272	25,866	31,193	57,059
2012	1,827	1,287	3,114	21,690	27,148	48,838	23,517	28,435	51,952
2013	3,784	3,846	7,630	21,268	26,353	47,621	25,052	30,199	55,251
2014	4,216	6,105	10,321	21,652	25,478	47,130	25,868	31,583	57,451
2015	4,178	7,312	11,490	21,356	22,490	43,846	25,534	29,802	55,336
2016 (a)	5,437	11,097	16,534	21,343	22,484	43,826	26,780	33,580	60,360
				Compounded Annual Growth Rate					
2004-2016	-2.9%	-2.8%	-3.9%	-6.7%	-7.1%	-6.9%	-6.1%	-5.3%	-5.6%

(a) Estimated from SJC 2016 data.

Sources: As noted, USDOT T100 data as compiled by DataBase Products and HNTB analysis.

Table C.13 – SJC Scheduled All-Cargo Aircraft Departures by Equipment Type

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
CESSNA 208 CARAVAN	1	1	1	-	-	-	-	-	-	-	-	-
DASSAULT-BREGUET MYSTERE-FALCON	6	-	-	1	-	-	1	-	-	-	-	-
CONVAIR CV-580	-	-	-	-	1	2	-	-	-	-	-	-
LOCKHEED L100-30/L-382E	-	-	-	-	-	-	-	-	1	-	-	-
AIRBUS INDUSTRIE A320-100/200	-	-	-	-	-	-	-	1	-	-	-	-
AIRBUS INDUSTRIE A310-200C/F	1	-	154	184	130	1	2	-	2	1	-	-
AIRBUS INDUSTRIE A300-600/R/CF/RCF	1	-	1	18	184	434	362	375	285	207	203	223
AIRBUS INDUSTRIE A300B/C/F-100/200	-	2	-	-	-	-	-	-	-	-	-	-
MCDONNELL DOUGLAS DC-9-15F	3	-	-	1	-	-	-	-	-	-	-	-
MCDONNELL DOUGLAS DC-9-30	2	-	-	1	-	-	-	-	-	-	-	-
MCDONNELL DOUGLAS DC-8-63F	-	-	-	3	-	-	1	2	-	-	-	-
MCDONNELL DOUGLAS DC-8-71	164	136	140	158	168	137	161	65	-	-	-	-
MCDONNELL DOUGLAS DC-8-73	18	1	-	-	46	-	-	-	-	-	-	-
MCDONNELL DOUGLAS DC-8-73F	24	70	64	45	72	68	70	100	-	-	-	-
MCDONNELL DOUGLAS DC-10-10	311	112	41	27	305	305	222	214	238	229	3	37
MCDONNELL DOUGLAS DC-10-30	398	365	317	394	119	15	10	19	6	6	2	28
MCDONNELL DOUGLAS MD-11	1	21	97	35	35	18	32	24	10	5	20	3
BOEING 727-100	-	2	-	-	-	-	-	-	-	-	-	-
BOEING 727-200/231A	1	175	54	2	-	-	3	1	-	-	-	-
BOEING 737-200C	1	-	-	-	-	-	-	-	-	-	-	-
BOEING 757-200	189	183	179	187	9	104	58	68	99	66	79	67
BOEING 767-200/200ER	258	252	256	235	107	-	-	-	-	-	-	-
BOEING 767-300/300ER	269	277	274	264	244	74	52	44	130	225	425	399
BOEING 777-200/200LR	-	-	-	-	-	-	-	1	-	-	-	-
BOEING 747-100	-	-	2	-	-	-	-	-	-	-	-	-
	1,648	1,597	1,580	1,555	1,420	1,158	974	914	771	739	732	757

Sources: USDOT T100 data as compiled by DataBase Products and HNTB analysis.

Table C.14 – Based General Aviation Aircraft at SJC

		Multi-Engine						
Year	Single Engine Piston	Piston	Turboprop	Subtotal	Jet	Helicopter	Other	Total
1993								491
1994								490
1995								495
1996								440
1997								420
1998								378
1999								349
2000								316
2001								279
2002								218
2003								191
2004								175
2005								184
2006								172
2007								166
2008								151
2009	71	13	9	22	55	1	0	149
2010	64	10	8	18	51	3	0	136
2011	61	10	7	17	48	3	0	129
2012	59	10	6	16	45	3	0	123
2013	62	9	5	14	54	3	0	133
2014	60	9	6	15	53	5	0	133
2015	62	8	5	13	57	4	0	136
2016	62	9	8	17	53	5	0	137

Sources: FAA, Terminal Area Forecast, and San Jose International Airport.

Table C.15 – Historical Aircraft Operations at SJC

Year	Passenger Carrier	Taxi/ Commuter	Cargo	GA Itinerant	GA Local	Military	Total
2002	121,334	15,132	5,103	53,973	11,863	105	207,510
2003	105,578	26,472	3,834	49,578	12,488	132	198,082
2004	102,728	30,328	3,610	46,628	14,895	125	198,314
2005	96,564	30,406	3,528	46,303	17,098	76	193,975
2006	97,198	29,832	3,452	40,921	16,962	97	188,462
2007	97,702	30,452	3,242	40,127	15,666	78	187,267
2008	93,270	25,096	2,884	35,599	15,654	73	172,576
2009	80,232	22,542	2,364	26,566	13,776	358	145,838
2010	73,586	16,956	1,984	26,335	4,356	273	123,490
2011	73,094	15,592	1,932	25,022	5,072	254	120,966
2012	70,562	15,752	1,540	25,686	5,638	251	119,429
2013	73,476	16,524	1,434	27,029	4,257	227	122,947
2014	73,430	18,174	1,546	26,255	4,541	192	124,138
2015	74,594	18,662	1,542	29,587	4,400	236	129,021
2016	101,790	1,490	1,616	29,380	4,363	276	138,915
Compounded Annual Growth Rate							
2002-2016	-1.2%	-15.3%	-7.9%	-4.3%	-6.9%	7.1%	-2.8%

Source: San Jose International Airport.

Table C.16 – SJC Aircraft Operations Distribution by Month

	2011	2012	2013	2014	2015	2016	Average Distribution (2011-2015)
			Passenger				
January	7,372	6,776	7,092	7,296	7,228	7,786	9.7%
February	6,688	6,348	6,346	6,566	6,582	7,348	8.9%
March	7,732	7,202	7,248	7,450	7,512	8,026	10.0%
April	7,378	7,110	7,280	7,510	7,802	7,956	10.0%
May	7,592	7,368	7,682	7,658	8,080	8,518	10.4%
June	7,708	7,458	7,808	8,032	8,162	9,116	10.7%
July	7,820	**7,872**	**8,246**	**8,342**	**8,392**	9,274	**11.1%**
August	**7,842**	7,742	8,178	8,140	8,318	**9,526**	11.0%
September	7,268	6,940	7,522	7,674	7,614	8,812	10.2%
October	7,342	7,392	7,786	7,928	7,944	9,106	10.5%
November	6,856	7,014	7,328	7,434	7,744	8,866	10.0%
December	7,508	7,088	7,484	7,570	7,878	8,946	10.3%
	89,106	86,310	90,000	91,600	93,256	103,280	122.9%
			Cargo				
January	160	130	**130**	**188**	128	128	10.7%
February	154	138	122	116	118	126	9.6%
March	178	148	128	114	122	148	10.4%
April	162	124	124	120	126	134	9.8%
May	170	134	122	122	112	128	9.8%
June	176	72	116	116	124	138	9.2%
July	152	124	122	130	128	118	9.6%
August	172	138	124	120	116	142	10.1%
September	128	118	112	116	130	126	9.1%
October	194	142	**130**	130	132	126	10.6%
November	134	126	98	112	120	126	8.9%
December	**210**	**152**	106	162	**186**	**176**	**12.3%**
	1,990	1,546	1,434	1,546	1,542	1,616	120.1%
			General Aviation				
January	2,335	2,694	2,545	2,231	2,793	2,209	9.4%
February	2,242	2,349	2,639	2,070	2,456	2,599	9.1%
March	2,435	2,686	2,888	2,530	2,793	2,634	10.1%
April	2,577	2,714	**3,107**	2,565	2,874	2,731	10.5%
May	2,523	2,715	2,795	2,478	2,942	3,036	10.5%
June	2,554	**3,078**	2,259	2,692	**3,158**	2,868	10.5%
July	2,637	2,802	2,515	2,583	3,002	**3,337**	10.7%
August	**2,843**	2,640	2,586	2,648	2,900	2,962	10.5%
September	2,551	2,648	2,625	2,883	2,767	3,173	10.6%
October	2,776	2,587	2,741	**2,938**	3,090	2,796	**10.7%**
November	2,437	2,538	2,388	2,654	2,741	2,886	9.9%
December	2,091	2,184	2,198	2,524	2,471	2,512	8.9%
	30,001	31,635	31,286	30,796	33,987	33,743	121.4%
			Military				
January	17	**34**	17	16	18	22	10.7%
February	19	32	25	10	15	38	**12.0%**
March	18	20	19	16	27	20	10.4%
April	13	26	23	26	29	16	11.5%
May	28	22	20	11	15	22	10.2%
June	**29**	21	10	16	12	21	9.4%
July	22	16	14	13	23	24	9.7%
August	21	12	**26**	**28**	20	10	10.1%
September	21	14	**26**	14	18	20	9.8%
October	25	14	8	17	**30**	**40**	11.6%
November	15	19	23	15	12	27	9.6%
December	19	26	16	10	17	16	9.0%
	247	256	227	192	236	276	123.8%
			Total				
January	9,884	9,634	9,784	9,731	10,167	10,145	9.6%
February	9,103	8,867	9,132	8,762	9,171	10,111	8.9%
March	10,363	10,056	10,283	10,110	10,454	10,828	10.1%
April	10,130	9,974	10,534	10,221	10,831	10,837	10.1%
May	10,313	10,239	10,619	10,269	11,149	11,704	10.4%
June	10,467	10,629	10,193	10,856	11,456	12,143	10.7%
July	10,631	**10,814**	10,897	**11,068**	**11,545**	**12,753**	11.0%
August	**10,878**	10,532	**10,914**	10,936	11,354	12,640	**10.9%**
September	9,968	9,720	10,285	10,687	10,529	12,131	10.3%
October	10,337	10,135	10,665	11,013	11,196	12,068	10.6%
November	9,442	9,697	9,837	10,215	10,617	11,905	10.0%
December	9,828	9,450	9,804	10,266	10,552	11,650	10.0%
	121,344	119,747	122,947	124,134	129,021	138,915	122.5%

Sources: San Jose International Airport and HNTB analysis.

APPENDIX D: SJC PASSENGER FORECAST WITHOUT DIVERSION FROM SFO AND OAK

Table D.1 presents the SJC domestic forecast originations equation and associated results. Since the forecasting model has a logarithmic formulation, each of the exponents associated with the input variables is an elasticity. With small changes in the input variables, the forecasting model can be interpreted as indicating that every 1.00 percent increase in Air Trade Area income will increase originations by approximately 0.85 percent and that every 1.0 percent decrease in SJC fares will increase originations by approximately 0.89 percent. To adjust for the most recent trends, the equation also includes a base year adjustment factor (.9143) that represents the ratio of actual 2014-2016 originations to projected 2014-2016 originations.

The approach used to project international Bay Area passenger originations was like to the approach used for SJC domestic originations. Regression analysis was used to develop a forecasting model. The forecast equation and results for international Bay Area originations are presented in **Table D.2**. The elasticities associated with the model indicate that each 1.0 percent increase in world GDP will increase Bay Area international originations by 1.168 percent and that each 1.0 percent decrease in international air fares will increase originations by 0.26 percent. To adjust for the most recent trends, the equation also includes a base year adjustment factor (1.0744) that represents the ratio of actual 2016 Bay Area international originations to projected 2016 originations.

Table D.3 presents the calculation of SJC's share of forecast Bay Area international originations. As shown, the SJC share of total Bay Area originations is projected to reach 8.0 percent by 2017 and remain constant thereafter.

Table D.4 summarizes the domestic and international originations forecasts from **Tables D.1** and **D.3**, and shows the SJC domestic and international enplanement forecasts. International originations are divided into those that fly directly from SJC to an international destination and those that fly to their international destination via another U.S. gateway. The total enplanement forecast was estimated from the originations forecast by assuming a 4.1 percent connecting passenger percentage. International enplanements are projected to increase faster than total international originations because the new SJC international service will allow international originating passengers that currently fly through other U.S. gateways (and are recorded as domestic enplanements) to fly direct from SJC.

Table D.1 – Forecast of Domestic Passenger Originations at SJC without Diversion from SFO and OAK

Year	Income (000's of 2015 dollars) (a)	Average SJC Air Fare (2015 dollars) (b)	US Unemployment Rate (c)	Domestic Originations (d)
2010	277,923,810	188.98	9.6	3,730,186
2011	295,106,395	204.60	8.9	3,730,725
2012	319,504,735	204.81	8.1	3,689,028
2013	323,553,704	205.65	7.4	3,852,342
2014	338,069,972	201.68	6.2	4,148,264
2015	374,626,565	206.22	5.3	4,301,060
2016	383,479,602	196.07	4.9	4,674,717
2022	438,803,023	189.81	4.9	5,501,877
2027	487,778,834	191.54	4.9	5,973,560
2032	537,010,821	187.17	4.9	6,619,849
2037	589,013,404	183.86	4.9	7,278,978

Compounded Annual Growth Rate	
2016-2037	2.1%

(a) Table 1.
(b) Tables B.2 and B.5 in Appendix B. Includes taxes and fees.
(c) Table A.10 in Appendix A.
(d) Based on following forecast equation:

DORIG = (10^1.586566) * (INC^.854057) * (FARE^-.89469) * (USUENP^-.21589) * (911^.088193) * (VASFO^.053671) * ADJ

where:
DORIG = domestic originations at SJC
INC = Income in SJC Air Trade Area (in thousands of 2015 dollars)
FARE = SJC fares including taxes and fees (in 2015 dollars)
USUEMP = U.S. uemployment percentage.
911 = instrument variable equal to 1 from 1990 to 2001 and 0 thereafter.
VASFO = instrument variable accounting for Virgin America service at SFO. Equal to 1 before 2007 and 0 after 2007.
ADJ = base year adjustment factor (.9143) that represents ratio of actual 2014-2016 originations to projected 2014-2016 originations.

R-squared = .9637
Adjusted R-squared = .9541
F-statistic = 100.87
Degrees of Freedom = 19

T-statistics

Intercept	1.57
INC	7.75
FARE	-10.33
USUEMP	-2.38
911	4.92
VASFO	2.32

Sources: As noted and HNTB analysis.

Table D.2 – International Originations Forecast for All Bay Area Airports

Year	World GDP (billions of 2010 dollars) (a)	Bay Area International Fare (2015 dollars) (b)	Weighted Exchange Rate (1973 = 100) (c)	Bay Area International Originations (d)
2010	65,424	719.45	75.32	4,765,457
2011	67,477	736.03	70.87	4,572,851
2012	69,137	718.22	73.52	4,864,300
2013	70,778	666.73	76.04	5,022,255
2014	72,760	684.19	78.40	5,186,637
2015	74,355	611.15	91.55	5,936,441
2016	76,373	569.02	95.87	6,638,825
2022	92,163	553.12	95.87	8,950,335
2027	107,033	534.17	95.87	10,757,519
2032	122,775	515.52	95.87	12,746,513
2037	139,736	493.77	95.87	14,995,965

Compounded Annual Growth Rate	
2016-2037	4.0%

(a) Table A.9 in Appendix A.
(b) Table B.7 in Appendix B.
(c) Table A.11 in Appendix A.
(d) Based on following forecast equation:

BAYIORIG = (10^1.223221) * (WGDP^1.168) * (FARE^-.26407) * (EXCH^.301274) * (2008^.053459) * (ADJ1)* (ADJ2)

where: BAYIORIG = international originations at three Bay Area airports.
WGDP = World GDP in billions of 2010 dollars
FARE = Average international fares for Bay Area airports (in 2015 dollars)
EXCH = Weighted exchange rate index for U.S. dollar (1973 = 100)
2008 = Instrument variable accounting for economic disruption in 2008, equal to 1 in 2008 and 0 in all other years.
ADJ1 = base year adjustment factor (1.0619) that represents ratio of extrapolated 2016 originations to projected 2016 originations.
ADJ2 = 2017 adjustment factor (1.0744) that represents addition 2017 expansion based on advance airline schedules.

R-squared = .9844
Adjusted R-squared = .9483
F-statistic = 46.89
Degrees of Freedom = 6

T-statistics

Intercept	1.72
WGDP	13.03
FARE	-1.93
EXCH	2.07
2008	4.41

Sources: As noted and HNTB analysis.

Table D.3 – Forecast of SJC International Originations

Year	Bay Area Originations (a)	SJC Originations (b)	SJC Share (c)
2010	4,765,457	169,574	3.6%
2011	4,572,851	182,296	4.0%
2012	4,864,300	185,769	3.8%
2013	5,022,255	252,847	5.0%
2014	5,186,637	280,390	5.4%
2015	5,936,441	314,723	5.3%
2016	6,638,825	443,857	6.7%
2022	8,950,335	716,027	8.0%
2027	10,757,519	860,601	8.0%
2032	12,746,513	1,019,721	8.0%
2037	14,995,965	1,199,677	8.0%
Compounded Annual Growth Rate			
2016-2037	4.0%	4.8%	0.9%

(a) Table D.2.

(b) Historical from Table C.2 in Appendix C. Forecast based on SJC share of Bay Area international originations.

(c) Assumed to increase to 8.0 percent by 2022 based on recent trends and additions to international air service at SJC.

Sources: As noted and HNTB analysis.

Table D.4 – SJC Passenger Enplanement Forecast (without Diversion from SFO and OAK)

	Originations					Revenue Enplanements				
Year	Domestic (a)	International Direct	International Connecting via Other Gateway	International (b)	Total	Domestic (c)	International (d)	Total (e)	Total Enplanements (f)	Total Passengers (Enplaned + Deplaned) (g)
2010	3,730,186	65,002	104,572	169,574	3,899,760	3,985,857	66,096	4,051,953	4,120,536	8,116,871
2011	3,730,725	78,914	103,382	182,296	3,913,021	4,020,075	83,429	4,103,504	4,175,854	8,215,042
2012	3,689,028	81,948	103,821	185,769	3,874,797	3,990,574	84,129	4,074,703	4,142,925	8,166,190
2013	3,852,342	135,296	117,551	252,847	4,105,189	4,162,531	146,091	4,308,622	4,377,055	8,637,162
2014	4,148,264	149,301	131,089	280,390	4,428,654	4,455,301	163,613	4,618,914	4,679,844	9,262,248
2015	4,301,060	178,551	136,172	314,723	4,615,783	4,624,709	192,681	4,817,390	4,885,690	9,799,427
2016	4,674,717	309,390	134,467	443,857	5,118,574	4,975,911	324,269	5,300,179	5,377,433	10,796,725
2022	5,501,877	544,985	171,041	716,027	6,217,903	5,912,542	571,195	6,483,737	6,578,241	13,156,483
2027	5,973,560	655,025	205,577	860,601	6,834,162	6,439,816	686,526	7,126,342	7,230,213	14,460,426
2032	6,619,849	776,134	243,587	1,019,721	7,639,571	7,152,724	813,460	7,966,184	8,082,297	16,164,593
2037	7,278,978	913,103	286,574	1,199,677	8,478,656	7,884,126	957,016	8,841,143	8,970,008	17,940,016
					Compounded Annual Growth Rate					
2015-2037	2.4%	7.7%	3.4%	6.3%	2.8%	2.5%	7.6%	2.8%	2.8%	2.8%
2017-2037	1.8%	3.6%	3.6%	3.6%	2.0%	1.8%	3.6%	2.0%	2.0%	2.0%

(a) Table D.1.
(b) Table D.3.
(c) Total enplanements less international enplanements.
(d) 2016 and 2017 estimated based on announced new international service. Ratio of international enplanements to international originations assumed to remain constant after 2017.
(e) Assumes 4.1 percent connecting percentage throughout forecast period.
(f) Includes non-revenue enplanements. Ratio of total enplanements to revenue enplanements assumed to remain constant in future.
(g) Future deplanements assumed to be the same as enplanements.

Sources: As noted and HNTB analysis.

APPENDIX E: SJC PASSENGER FORECAST WITH DIVERSION FROM SFO AND OAK

As noted in Section 5, the diversion analysis was based on the FAA Terminal Area Forecasts (TAF) for SFO and OAK and included an adjustment to reflect FAA trends in load factor and average seats per aircraft to reflect a more aggressive airline response to limited airfield capacity.

Table E.1 presents an adjusted SFO forecast of passengers per aircraft for the commuter, domestic air carrier, and international passenger categories based on FAA national projections of average seats per aircraft and load factor.

Table E.2 presents the most recent (2016) TAF for SFO and **Table E.3** shows an adjusted SFO TAF incorporating the modified passenger per aircraft projections from **Table E.2**. **Table E.4** shows the modified SFO TAF before and after the airfield constraint is applied. Prior to the modification, the TAF was projecting 647,566 SFO operations in 2037 (**Table E.2**). With the modification, the 2037 SFO operations forecast was reduced to 601,810 operations, and with the constraint the 2037 operations forecast was reduced to 472,500 operations.

Table E.5 shows the estimated distribution of passengers that cannot be accommodated at SFO to SJC and OAK. As noted in Section 5, 76 percent of re-distributed passengers are expected to go to OAK and 24 percent to SJC. Many of the passengers that would be lost to SFO would be connecting passengers, and it is not anticipated that either SJC or OAK would be able to recapture most of these since neither airport has a hub carrier.

Table E.6 presents the most recent 2016 TAF for OAK. The assumptions used to up-gauge aircraft at OAK prior to and after reaching capacity were the same as for SFO. The OAK TAF, including SFO diversions, is presented in **Table E.7**. Based on the analysis, OAK is anticipated to exceed its commercial aircraft capacity in 2035. **Table E.8** shows the resulting estimate of OAK passengers diverted to SJC.

Table E.9 provides an analysis of the impact of diversions from SFO and OAK on SJC passenger activity. Diversions from SFO are estimated to begin in 2019 and diversions from OAK are estimated to begin in 2035. By 2037, there would be an estimated 2.2 million diverted originations at SJC, accounting for about 23 percent of the total. With diversions, the average annual 2016-2037 growth rate would increase to 3.4 percent, compared to 2.1 percent without diversions. With diversions, the 17.6 million passenger threshold would be achieved approximately in 2031.

Table E.1 – FAA National Projections of Average Seats per Aircraft and Load Factor

	FAA Mainline Carrier			FAA Commuter Carrier			FAA Int Carrier			SFO Passengers per Aircraft (b)			SFO Passengers per Aircraft adj for 2016 TAF (b)		
Year	Average Seats	Load Factor	Passengers/ Aircraft (a)	Average Seats	Load Factor	Passengers/ Aircraft (a)	Average Seats	Load Factor	Passengers/ Aircraft (a)	Mainline Carrier	Commuter	International	Mainline Carrier	Commuter	International
2015	158	85.1	134.5	60	80.1	48.1	220	80.8	177.8	130.0	53.5	202.2	130.0	53.5	202.2
2016	158	85.8	135.6	61	80.4	49.0	220	81.9	180.2	131.1	54.6	204.9	131.8	54.9	206.1
2017	159	85.9	136.6	62	80.4	49.8	220	81.9	180.2	132.1	55.5	204.9	133.7	56.2	207.4
2018	160	86.1	137.8	63	80.4	50.7	220	81.9	180.2	133.2	56.4	204.9	134.8	57.1	207.4
2019	160	86.3	138.1	63	80.5	50.7	220	81.9	180.2	133.5	56.4	204.9	135.2	57.1	207.4
2020	161	86.4	139.1	64	80.5	51.5	221	81.9	181.0	134.5	57.3	205.8	136.2	58.1	208.4
2021	161	86.5	139.3	65	80.5	52.3	221	81.9	181.0	134.7	58.2	205.8	136.3	59.0	208.4
2022	162	86.6	140.3	65	80.6	52.4	221	81.9	181.0	135.7	58.3	205.8	137.3	59.0	208.4
2023	162	86.7	140.5	66	80.6	53.2	221	81.9	181.0	135.8	59.2	205.8	137.5	59.9	208.4
2024	163	86.7	141.3	66	80.6	53.2	222	81.8	181.6	136.6	59.2	206.5	138.3	59.9	209.1
2025	164	86.8	142.4	67	80.7	54.1	222	81.8	181.6	137.6	60.2	206.5	139.3	60.9	209.1
2026	164	86.9	142.5	67	80.7	54.1	222	81.8	181.6	137.8	60.2	206.5	139.5	60.9	209.1
2027	164	86.9	142.5	68	80.7	54.9	222	81.8	181.6	137.8	61.1	206.5	139.5	61.8	209.1
2028	165	86.9	143.4	68	80.7	54.9	223	81.8	182.4	138.6	61.1	207.4	140.3	61.8	210.0
2029	165	87.0	143.6	69	80.7	55.7	223	81.8	182.4	138.8	62.0	207.4	140.5	62.7	210.0
2030	166	87.0	144.4	69	80.8	55.8	223	81.8	182.4	139.6	62.1	207.4	141.4	62.8	210.0
2031	166	87.1	144.6	70	80.8	56.6	223	81.8	182.4	139.8	63.0	207.4	141.5	63.7	210.0
2032	167	87.1	145.5	70	80.8	56.6	224	81.8	183.2	140.6	63.0	208.4	142.4	63.7	210.9
2033	167	87.1	145.5	71	80.8	57.4	224	81.8	183.2	140.6	63.9	208.4	142.4	64.6	210.9
2034	168	87.2	146.5	71	80.8	57.4	224	81.8	183.2	141.7	63.9	208.4	143.4	64.6	210.9
2035	168	87.2	146.5	72	80.9	58.2	225	81.8	184.1	141.7	64.8	209.3	143.4	65.6	211.9
2036	168	87.2	146.5	72	80.9	58.2	225	81.8	184.1	141.7	64.8	209.3	143.4	65.6	211.9
2037	168	87.2	146.9	73	80.9	58.7	225	81.8	184.3	142.0	65.3	209.6	143.8	66.1	212.2

(a) Average seats multiplied by load factor.

(b) 2015 data from US DOT T100 database as compiled by Database Products. Assumed to increase at same rate as FAA forecast of passengers per aircraft in each category.

(a) FAA Aerospace Forecasts: Fiscal Years 2016-2036. Table 11, Table 14, Table 24, and Table 26, and HTNB analysis.

Table E.2 – SFO 2016 Terminal Area Forecast (Unconstrained)

	Enplanements				Operations					
Year	Domestic Air Carrier	Commuter Air Carrier	International Air Carrier	Total	Air Carrier	Air Taxi & Commuter	Commer-cial (a)	General Aviation	Military	Total
2015	16,204,146	2,397,514	5,130,055	23,731,715	348,592	64,410	413,002	13,651	2,550	429,203
2016	17,495,642	2,301,903	5,662,478	25,460,023	373,774	57,899	431,673	12,973	2,606	447,252
2017	18,471,115	2,285,388	6,504,252	27,260,755	396,944	51,851	448,795	12,609	2,603	464,007
2018	18,903,848	2,337,441	6,732,722	27,974,011	412,323	45,224	457,547	12,672	2,600	472,819 (b)
2019	19,288,927	2,384,226	6,961,335	28,634,488	427,444	37,705	465,149	12,735	2,597	480,481
2020	19,659,361	2,429,496	7,189,957	29,278,814	442,130	30,395	472,525	12,799	2,594	487,918
2021	20,026,523	2,474,323	7,418,579	29,919,425	456,309	23,687	479,996	12,863	2,591	495,450
2022	20,380,522	2,517,912	7,647,201	30,545,635	468,565	19,288	487,853	12,927	2,588	503,368
2023	20,725,843	2,560,801	7,875,823	31,162,467	478,129	18,334	496,463	12,992	2,585	512,040
2024	21,057,498	2,602,437	8,104,445	31,764,380	486,602	18,458	505,060	13,057	2,582	520,699
2025	21,392,083	2,644,730	8,335,657	32,372,470	495,105	18,644	513,749	13,122	2,579	529,450
2026	21,757,470	2,690,545	8,570,448	33,018,463	504,229	18,832	523,061	13,188	2,576	538,825
2027	22,120,945	2,736,155	8,808,332	33,665,432	513,340	19,022	532,362	13,254	2,573	548,189
2028	22,481,366	2,782,093	9,059,488	34,322,947	522,495	19,214	541,709	13,321	2,570	557,600
2029	22,852,353	2,829,699	9,313,904	34,995,956	531,900	19,408	551,308	13,388	2,567	567,263
2030	23,224,735	2,877,863	9,568,675	35,671,273	541,348	19,604	560,952	13,455	2,564	576,971
2031	23,597,633	2,926,064	9,823,446	36,347,143	550,797	19,802	570,599	13,523	2,561	586,683
2032	23,970,841	2,974,413	10,078,217	37,023,471	560,254	20,002	580,256	13,591	2,558	596,405
2033	24,346,473	3,023,136	10,332,988	37,702,597	569,756	20,204	589,960	13,659	2,555	606,174
2034	24,737,720	3,073,679	10,587,759	38,399,158	579,555	20,408	599,963	13,728	2,552	616,243
2035	25,148,345	3,126,647	10,842,530	39,117,522	589,738	20,614	610,352	13,797	2,549	626,698
2036	25,561,938	3,179,923	11,097,301	39,839,162	599,969	20,822	620,791	13,867	2,546	637,204
2037	25,967,763	3,232,478	11,352,072	40,552,313	610,054	21,032	631,086	13,937	2,543	647,566

(a) Air carrier plus air taxi and commuter.
(b) Airfield capacity exceeded.

Source: Federal Aviation Administration, 2016 Terminal Area Forecast.

Table E.3 – Estimated Effect of Up-Gauging on TAF Forecast of SFO Commercial Aircraft Operations

	Unconstrained SFO Enplanements (a)				SFO Passengers/Aircraft with Up-Guaging (b)			Estimated Commercial Operations with Up-Gauging (c)					
Year	Domestic Air Carrier	Commuter Air Carrier	International Air Carrier	Total	Domestic Air Carrier	Commuter Air Carrier	International Air Carrier	Domestic Air Carrier	Commuter Air Carrier	International Air Carrier	All-Cargo and Other (d)	Total	
2015	16,204,146	2,397,514	5,130,055	23,731,715	130.0	53.5	202.2	246,906	88,958	50,708	26,430	413,002	
2016	17,495,642	2,301,903	5,662,478	25,460,023	131.8	54.9	206.1	265,406	83,850	54,951	27,625	431,832	
2017	18,471,115	2,285,388	6,504,252	27,260,755	133.7	56.2	207.4	276,330	81,379	62,714	28,721	449,144	
2018	18,903,848	2,337,441	6,732,722	27,974,011	134.8	57.1	207.4	280,383	81,912	64,917	29,281	456,492	
2019	19,288,927	2,384,226	6,961,335	28,634,488	135.2	57.1	207.4	285,432	83,448	67,121	29,767	465,767	
2020	19,659,361	2,429,496	7,189,957	29,278,814	136.2	58.1	208.4	288,772	83,703	69,012	30,239	471,726	
2021	20,026,523	2,474,323	7,418,579	29,919,425	136.5	59.0	208.4	293,485	83,936	71,206	30,717	479,345	(e)
2022	20,380,522	2,517,912	7,647,201	30,545,635	138.5	59.0	208.4	294,316	85,309	73,401	31,220	484,246	
2023	20,725,843	2,560,801	7,875,823	31,162,467	138.8	59.9	208.4	298,613	85,447	75,595	31,771	491,426	
2024	21,057,498	2,602,437	8,104,445	31,764,380	140.5	59.9	209.7	299,680	86,837	77,279	32,321	496,117	
2025	21,392,083	2,644,730	8,335,657	32,372,470	142.6	60.9	209.7	300,048	86,823	79,483	32,877	499,232	
2026	21,757,470	2,690,545	8,570,448	33,018,463	142.9	60.9	209.7	304,471	88,327	81,722	33,473	507,993	
2027	22,120,945	2,736,155	8,808,332	33,665,432	142.9	61.8	209.7	309,557	88,504	83,991	34,068	516,120	
2028	22,481,366	2,782,093	9,059,488	34,322,947	144.7	61.8	211.6	310,799	89,989	85,612	34,667	521,067	
2029	22,852,353	2,829,699	9,313,904	34,995,956	145.0	62.7	211.6	315,202	90,203	88,017	35,281	528,702	
2030	23,224,735	2,877,863	9,568,675	35,671,273	146.8	62.8	211.6	316,490	91,625	90,424	35,898	534,437	
2031	23,597,633	2,926,064	9,823,446	36,347,143	147.1	63.7	211.6	320,834	91,828	92,832	36,515	542,010	
2032	23,970,841	2,974,413	10,078,217	37,023,471	148.9	63.7	213.5	322,017	93,346	94,391	37,133	546,887	
2033	24,346,473	3,023,136	10,332,988	37,702,597	148.9	64.6	213.5	327,063	93,538	96,777	37,754	555,133	
2034	24,737,720	3,073,679	10,587,759	38,399,158	151.0	64.6	213.5	327,622	95,102	99,163	38,395	560,282	
2035	25,148,345	3,126,647	10,842,530	39,117,522	151.0	65.6	215.5	333,060	95,280	100,649	39,059	568,048	
2036	25,561,938	3,179,923	11,097,301	39,839,162	151.0	65.6	215.5	338,537	96,903	103,014	39,727	578,182	
2037	25,967,763	3,232,478	11,352,072	40,552,313	151.8	66.1	216.0	342,045	97,801	105,098	40,386	585,330	

(a) Table E.2.
(b) Table E.1. Once capacity is reached, domestic and international passengers per aircraft assumed to increase at double the unconstrained rate.
(c) Unconstrained enplanements divided by SFO Passengers per aircraft and multiplied by 2.
(d) Assumed to increase at same rate as SFO TAF forecast of commercial operations (see Table E.2).
(e) Airfield capacity exceeded.

Sources: As noted and HNTB analysis.

Table E.4 – SFO Constrained Operations Forecast

	Unconstrained Operations Forecast Including Upguaging (a)							Constrained SFO Operations Forecast							Percent Loss (f)	
Year	Domestic Air Carrier	Commuter Air Carrier	International Air Carrier	All-Cargo and Other	General Aviation	Military	Total	Domestic Air Carrier (b)	Commuter Air Carrier (b)	International Air Carrier (c)	All-Cargo and Other (d)	General Aviation (b)	Military (e)	Total	Domestic Air Carrier	Commuter Air Carrier
2015	246,906	88,958	50,708	26,430	13,651	2,550	429,203	246,906	88,958	50,708	26,430	13,651	2,550	429,203	0.0%	0.0%
2016	265,406	83,850	54,951	27,625	12,973	2,606	447,411	265,406	83,850	54,951	27,625	12,973	2,606	447,411	0.0%	0.0%
2017	276,330	81,379	62,714	28,721	12,609	2,603	464,356	276,330	81,379	62,714	28,721	12,609	2,603	464,356	0.0%	0.0%
2018	280,383	81,912	64,917	29,281	12,672	2,600	471,764	280,383	81,912	64,917	29,281	12,672	2,600	471,764	0.0%	0.0%
2019	285,432	83,448	67,121	29,767	12,735	2,597	481,099	279,363	81,673	67,121	29,281	12,464	2,597	472,500	-2.1%	-2.1%
2020	288,772	83,703	69,012	30,239	12,799	2,594	487,119	278,533	80,736	69,012	29,281	12,345	2,594	472,500	-3.5%	-3.5%
2021	293,485	83,936	71,206	30,717	12,863	2,591	494,799	277,797	79,450	71,206	29,281	12,175	2,591	472,500	-5.3%	-5.3%
2022	294,316	85,309	73,401	31,220	12,927	2,588	499,761	275,331	79,806	73,401	29,281	12,093	2,588	472,500	-6.5%	-6.5%
2023	298,613	85,447	75,595	31,771	12,992	2,585	507,003	274,537	78,558	75,595	29,281	11,945	2,585	472,500	-8.1%	-8.1%
2024	299,680	86,837	77,279	32,321	13,057	2,582	511,756	272,519	78,966	77,279	29,281	11,874	2,582	472,500	-9.1%	-9.1%
2025	300,048	86,823	79,483	32,877	13,122	2,579	514,933	270,917	78,393	79,483	29,281	11,848	2,579	472,500	-9.7%	-9.7%
2026	304,471	88,327	81,722	33,473	13,188	2,576	523,757	269,174	78,088	81,722	29,281	11,659	2,576	472,500	-11.6%	-11.6%
2027	309,557	88,504	83,991	34,068	13,254	2,573	531,947	268,421	76,742	83,991	29,281	11,493	2,573	472,500	-13.3%	-13.3%
2028	310,799	89,989	85,612	34,667	13,321	2,570	536,958	266,465	77,153	85,612	29,281	11,421	2,570	472,500	-14.3%	-14.3%
2029	315,202	90,203	88,017	35,281	13,388	2,567	544,657	265,410	75,953	88,017	29,281	11,273	2,567	472,500	-15.8%	-15.8%
2030	316,490	91,625	90,424	35,898	13,455	2,564	550,456	262,933	76,120	90,424	29,281	11,178	2,564	472,500	-16.9%	-16.9%
2031	320,834	91,828	92,832	36,515	13,523	2,561	558,094	261,845	74,945	92,832	29,281	11,037	2,561	472,500	-18.4%	-18.4%
2032	322,017	93,346	94,391	37,133	13,591	2,558	563,036	259,947	75,353	94,391	29,281	10,971	2,558	472,500	-19.3%	-19.3%
2033	327,063	93,538	96,777	37,754	13,659	2,555	571,347	258,998	74,072	96,777	29,281	10,816	2,555	472,500	-20.8%	-20.8%
2034	327,622	95,102	99,163	38,395	13,728	2,552	576,562	256,349	74,413	99,163	29,281	10,742	2,552	472,500	-21.8%	-21.8%
2035	333,060	95,280	100,649	39,059	13,797	2,549	584,394	256,138	73,274	100,649	29,281	10,610	2,549	472,500	-23.1%	-23.1%
2036	338,537	96,903	103,014	39,727	13,867	2,546	594,595	254,415	72,824	103,014	29,281	10,421	2,546	472,500	-24.8%	-24.8%
2037	342,045	97,801	105,098	40,386	13,937	2,543	601,810	252,947	72,325	105,098	29,281	10,307	2,543	472,500	-26.0%	-26.0%

(a) Tables E.2 and E.3.
(b) Domestic air carrier, commuter, and GA reduced proportionately to maintain total operations at 472,500.
(c) Assumed to grow at unconstrained rate with upguaging.
(d) Assumed to remain constant.
(e) Assumed to decline at unconstrained rate.
(f) Difference between constrained and unconstrained forecasts.

Sources: As noted and HNTB analysis.

Table E.5 – Estimated Passengers Diverted from SFO

	TAF Forecast of SFO Passenger Enplanements (a)		Percent Diverted (b)		Diverted Enplanements (c)				Diverted Originations (e)		
Year	Domestic Air Carrier	Commuter Air Carrier	Domestic Air Carrier	Commuter Air Carrier	Domestic Air Carrier	Commuter Air Carrier	Total	SFO Domestic Connecting Percentage (d)	Total	to SJC (f)	to OAK (g)
2015	16,204,146	2,397,514	0.0%	0.0%	-	-	-	26.4%	-	-	-
2016	17,495,642	2,301,903	0.0%	0.0%	-	-	-	26.4%	-	-	-
2017	18,471,115	2,285,388	0.0%	0.0%	-	-	-	26.4%	-	-	-
2018	18,903,848	2,337,441	0.0%	0.0%	-	-	-	26.4%	-	-	-
2019	19,288,927	2,384,226	-2.1%	-2.1%	410,102	50,701	460,803	26.4%	339,216	81,412	257,804
2020	19,659,361	2,429,496	-3.5%	-3.5%	697,037	86,127	783,164	26.4%	576,519	138,365	438,155
2021	20,026,523	2,474,323	-5.3%	-5.3%	1,070,501	132,248	1,202,750	26.4%	885,394	212,495	672,899
2022	20,380,522	2,517,912	-6.5%	-6.5%	1,314,653	162,421	1,477,074	26.4%	1,087,335	260,960	826,375
2023	20,725,843	2,560,801	-8.1%	-8.1%	1,671,026	206,473	1,877,499	26.4%	1,382,104	331,705	1,050,399
2024	21,057,498	2,602,437	-9.1%	-9.1%	1,908,508	235,882	2,144,390	26.4%	1,578,574	378,858	1,199,716
2025	21,392,083	2,644,730	-9.7%	-9.7%	2,076,889	256,791	2,333,680	26.4%	1,717,918	412,300	1,305,618
2026	21,757,470	2,690,545	-11.6%	-11.6%	2,522,300	311,897	2,834,197	26.4%	2,086,369	500,729	1,585,641
2027	22,120,945	2,736,155	-13.3%	-13.3%	2,939,584	363,617	3,303,201	26.4%	2,431,623	583,590	1,848,033
2028	22,481,366	2,782,093	-14.3%	-14.3%	3,206,858	396,849	3,603,707	26.4%	2,652,838	636,681	2,016,157
2029	22,852,353	2,829,699	-15.8%	-15.8%	3,609,948	447,022	4,056,970	26.4%	2,986,503	716,761	2,269,743
2030	23,224,735	2,877,863	-16.9%	-16.9%	3,930,149	486,988	4,417,138	26.4%	3,251,638	780,393	2,471,245
2031	23,597,633	2,926,064	-18.4%	-18.4%	4,338,690	537,980	4,876,670	26.4%	3,589,918	861,580	2,728,338
2032	23,970,841	2,974,413	-19.3%	-19.3%	4,620,450	573,328	5,193,778	26.4%	3,823,355	917,605	2,905,750
2033	24,346,473	3,023,136	-20.8%	-20.8%	5,066,726	629,151	5,695,877	26.4%	4,192,970	1,006,313	3,186,657
2034	24,737,720	3,073,679	-21.8%	-21.8%	5,381,576	668,673	6,050,250	26.4%	4,453,839	1,068,921	3,384,917
2035	25,148,345	3,126,647	-23.1%	-23.1%	5,808,133	722,126	6,530,260	26.4%	4,807,194	1,153,727	3,653,467
2036	25,561,938	3,179,923	-24.8%	-24.8%	6,351,825	790,169	7,141,994	26.4%	5,257,517	1,261,804	3,995,713
2037	25,967,763	3,232,478	-26.0%	-26.0%	6,764,230	842,027	7,606,257	26.4%	5,599,280	1,343,827	4,255,453

(a) Table E.3.
(b) Table E.4.
(c) TAF enplanements multiplied by percent diverted.
(d) Based on 2015 O&D Survey data and T100 data from US DOT.
(e) Diverted enplanements less connections.
(f) Estimated at 24 percent of total based on analysis of past changes in Bay Area traffic share.
(g) Estimated at 76 percent of total based on analysis of past changes in Bay Area traffic share.

Sources: As noted and HNTB analysis.

Table E.6 – OAK 2016 Terminal Area Forecast (Unconstrained)

	Enplanements				Operations					
Year	Domestic Air Carrier	Commuter Air Carrier	International Air Carrier	Total	Air Carrier	Air Taxi & Commuter	Commer-cial (a)	General Aviation	Military	Total
2015	4,966,755	276,694	147,570	5,391,019	114,713	20,432	135,145	72,464	2,069	209,678
2016	5,437,957	217,974	174,813	5,830,744	122,222	24,721	146,943	75,253	2,395	224,591
2017	6,048,515	133,284	223,538	6,405,337	129,132	23,976	153,108	71,366	2,395	226,869
2018	6,194,308	136,165	249,183	6,579,656	132,251	24,213	156,464	71,466	2,395	230,325
2019	6,324,002	138,728	274,828	6,737,558	135,080	24,452	159,532	71,566	2,395	233,493
2020	6,449,128	141,198	300,473	6,890,799	137,830	24,696	162,526	71,667	2,395	236,588
2021	6,572,947	143,640	326,118	7,042,705	140,560	24,943	165,503	71,768	2,395	239,666
2022	6,692,455	146,006	351,763	7,190,224	143,214	25,194	168,408	71,869	2,395	242,672
2023	6,808,841	148,302	377,408	7,334,551	145,811	25,449	171,260	71,970	2,395	245,625
2024	6,920,822	150,525	403,053	7,474,400	148,333	25,707	174,040	72,071	2,395	248,506
2025	7,033,771	152,759	428,698	7,615,228	150,873	25,967	176,840	72,173	2,395	251,408
2026	7,157,331	155,189	454,343	7,766,863	153,608	26,230	179,838	72,275	2,395	254,508
2027	7,280,176	157,613	479,988	7,917,777	156,337	26,496	182,833	72,378	2,395	257,606
2028	7,402,202	160,006	505,633	8,067,841	159,053	26,764	185,817	72,481	2,395	260,693
2029	7,527,701	162,468	531,278	8,221,447	161,835	27,035	188,870	72,584	2,395	263,849
2030	7,654,284	164,961	556,923	8,376,168	164,643	27,309	191,952	72,688	2,395	267,035
2031	7,780,312	167,449	582,568	8,530,329	167,444	27,586	195,030	72,792	2,395	270,217
2032	7,906,709	169,932	608,213	8,684,854	170,257	27,865	198,122	72,897	2,395	273,414
2033	8,034,199	172,439	633,858	8,840,496	173,094	28,147	201,241	73,002	2,395	276,638
2034	8,167,154	175,047	659,503	9,001,704	176,032	28,432	204,464	73,107	2,395	279,966
2035	8,307,009	177,797	685,148	9,169,954	179,101	28,720	207,821	73,212	2,395	283,428
2036	8,447,783	180,566	710,793	9,339,142	182,191	29,011	211,202	73,317	2,395	286,914
2037	8,586,483	183,288	736,438	9,506,209	185,246	29,305	214,551	73,423	2,395	290,369

(a) Air carrier plus air taxi and commuter.

Source: Federal Aviation Administration, 2016 Terminal Area Forecast.

Table E.7 – OAK Passenger Forecast Including Passengers Diverted from SFO

	Diverted from SFO						Commercial Operations					
							Before SFO Diversion (f)			After SFO Diversion (g)		
Year	Originations (a)	OAK Connecting Percentage (b)	Enplanements (c)	Unconstrained Enplanements (d)	Total Including SFO Diversion (e)	Percent Increase	Passenger (h)	All-Cargo and Other (i)	Total	Passenger	All-Cargo and Other	Total
2015	-	9.6%	-	5,391,019	5,391,019	0.0%	99,250	35,895	135,145	99,250	35,895	135,145
2016	-	9.6%	-	5,830,744	5,830,744	0.0%	111,140	35,803	146,943	111,140	35,803	146,943
2017	-	9.6%	-	6,405,337	6,405,337	0.0%	119,270	36,355	155,625	119,270	36,355	155,625
2018	-	9.6%	-	6,579,656	6,579,656	0.0%	121,255	36,952	158,207	121,255	36,952	158,207
2019	257,804	9.6%	285,185	6,737,558	7,022,743	4.2%	123,902	37,641	161,543	129,146	37,641	166,788
2020	438,155	9.6%	484,689	6,890,799	7,375,488	7.0%	125,547	38,331	163,878	134,378	38,331	172,709
2021	672,899	9.6%	744,366	7,042,705	7,787,071	10.6%	127,638	39,158	166,796	141,129	39,158	180,287
2022	826,375	9.6%	914,141	7,190,224	8,104,365	12.7%	128,797	39,802	168,598	145,171	39,802	184,973
2023	1,050,399	9.6%	1,161,959	7,334,551	8,496,510	15.8%	130,701	39,894	170,595	151,407	39,894	191,301
2024	1,199,716	9.6%	1,327,134	7,474,400	8,801,534	17.8%	131,930	40,997	172,927	155,355	40,997	196,352
2025	1,305,618	9.6%	1,444,283	7,615,228	9,059,511	19.0%	132,430	41,318	173,748	157,546	41,318	198,864
2026	1,585,641	9.6%	1,754,046	7,766,863	9,520,909	22.6%	134,829	42,192	177,021	165,279	42,192	207,470
2027	1,848,033	9.6%	2,044,306	7,917,777	9,962,083	25.8%	136,998	43,341	180,339	172,370	43,341	215,711
2028	2,016,157	9.6%	2,230,285	8,067,841	10,298,126	27.6%	138,291	44,168	182,459	176,520	44,168	220,688
2029	2,269,743	9.6%	2,510,804	8,221,447	10,732,251	30.5%	140,223	44,995	185,219	183,047	44,995	228,042
2030	2,471,245	9.6%	2,733,707	8,376,168	11,109,875	32.6%	141,500	45,731	187,231	187,681	45,731	233,412
2031	2,728,338	9.6%	3,018,105	8,530,329	11,548,434	35.4%	143,397	46,696	190,093	194,132	46,696	240,828
2032	2,905,750	9.6%	3,214,359	8,684,854	11,899,213	37.0%	144,651	47,523	192,174	198,188	47,523	245,711
2033	3,186,657	9.6%	3,525,101	8,840,496	12,365,597	39.9%	146,788	48,534	195,323	205,320	48,534	253,854
2034	3,384,917	9.6%	3,744,417	9,001,704	12,746,121	41.6%	147,833	49,407	197,241	209,327	49,407	258,734
2035	3,653,467	9.6%	4,041,489	9,169,954	13,211,443	44.1%	150,095	50,372	200,467	216,247	50,372	266,619 (j)
2036	3,995,713	9.6%	4,420,083	9,339,142	13,759,225	47.3%	152,884	51,200	204,084	225,242	51,200	276,442
2037	4,255,453	9.6%	4,707,409	9,506,209	14,213,618	49.5%	153,838	52,027	205,865	230,017	52,027	282,044

(a) Table E.5.
(b) Based on 2015 O&D Survey data and T100 data from US DOT.
(c) Diverted originations plus connections based on OAK connection ratio.
(d) Table E.6.
(e) Unconstrained enplanements plus diverted enplanements.
(f) 2015 breakout of commercial operations between passenger, all-cargo and other based on US DOT T100 data as compiled by Database Products.
(g) Passenger operations calculated from passenger operations (before diversion) multiplied by percent increase in enplanements resulting from diversion. All-cargo and other forecast assumed to be unconstrained.
(h) Assumes passengers per operation increases at same rate as domestic mainline from Table E.1. Increase in passengers per operation assumed to double after OAK capacity is reached.
(i) Assumed to increase at same rate as FAA national forecast of all-cargo aircraft.
(j) Airfield capacity is exceeded for commercial operations.

Sources: As noted and HNTB analysis.

Table E.8 – Estimated Passengers Diverted from OAK

Year	Unconstrained Forecast with SFO Diversion (a)			Constrained Forecast with SFO Diversion (b)			Percent Passenger Operations Diverted (c)	Unconstrained Enplanements with SFO Diversion (d)	Passengers Diverted to SJC		
	Passenger	All-Cargo and Other	Total	Passenger	All-Cargo and Other	Total			Diverted Enplanements (e)	OAK Connecting Percentage (f)	Diverted Originations (g)
2015	99,250	35,895	135,145	99,250	35,895	135,145	0.0%	5,391,019	-	9.6%	-
2016	111,140	35,803	146,943	111,140	35,803	146,943	0.0%	5,830,744	-	9.6%	-
2017	119,270	36,355	155,625	119,270	36,355	155,625	0.0%	6,405,337	-	9.6%	-
2018	121,255	36,952	158,207	121,255	36,952	158,207	0.0%	6,579,656	-	9.6%	-
2019	129,146	37,641	166,788	129,146	37,641	166,788	0.0%	7,022,743	-	9.6%	-
2020	134,378	38,331	172,709	134,378	38,331	172,709	0.0%	7,375,488	-	9.6%	-
2021	141,129	39,158	180,287	141,129	39,158	180,287	0.0%	7,787,071	-	9.6%	-
2022	145,171	39,802	184,973	145,171	39,802	184,973	0.0%	8,104,365	-	9.6%	-
2023	151,407	39,894	191,301	151,407	39,894	191,301	0.0%	8,496,510	-	9.6%	-
2024	155,355	40,997	196,352	155,355	40,997	196,352	0.0%	8,801,534	-	9.6%	-
2025	157,546	41,318	198,864	157,546	41,318	198,864	0.0%	9,059,511	-	9.6%	-
2026	165,279	42,192	207,470	165,279	42,192	207,470	0.0%	9,520,909	-	9.6%	-
2027	172,370	43,341	215,711	172,370	43,341	215,711	0.0%	9,962,083	-	9.6%	-
2028	176,520	44,168	220,688	176,520	44,168	220,688	0.0%	10,298,126	-	9.6%	-
2029	183,047	44,995	228,042	183,047	44,995	228,042	0.0%	10,732,251	-	9.6%	-
2030	187,681	45,731	233,412	187,681	45,731	233,412	0.0%	11,109,875	-	9.6%	-
2031	194,132	46,696	240,828	194,132	46,696	240,828	0.0%	11,548,434	-	9.6%	-
2032	198,188	47,523	245,711	198,188	47,523	245,711	0.0%	11,899,213	-	9.6%	-
2033	205,320	48,534	253,854	205,320	48,534	253,854	0.0%	12,365,597	-	9.6%	-
2034	209,327	49,407	258,734	209,327	49,407	258,734	0.0%	12,746,121	-	9.6%	-
2035	216,247	50,372	266,619	214,933	50,067	265,000	0.6%	13,211,443	80,718	9.6%	72,968
2036	225,242	51,200	276,442	215,919	49,081	265,000	4.3%	13,759,225	594,083	9.6%	537,045
2037	230,017	52,027	282,044	216,117	48,883	265,000	6.4%	14,213,618	914,204	9.6%	826,432

(a) Table E.7.
(b) Passenger and all-cargo and other operations reduced proportionately to maintain commercial operations at 265,000.
(c) Difference between constrained and unconstrained forecasts.
(d) Table E.7.
(e) Unconstrained enplanements with SFO diversion multiplied by percent diverted.
(f) Based on 2015 O&D Survey data and T100 data from US DOT.
(g) Diverted enplanements less connections.

Sources: As noted and HNTB analysis.

Table E.9 – SJC Passenger Forecast Adjusted for Diversion

	Originations						Revenue Enplanements				
	Domestic										
Year	Baseline (a)	Diverted from SFO (b)	Diverted from OAK (c)	Subtotal Domestic	International (a)	Total	Domestic (d)	International (a)	Total (e)	Total Enplanements (f)	Total Passengers (Enplaned + Deplaned)
2015	4,301,060	-	-	4,301,060	314,723	4,615,783	4,624,709	192,681	4,817,390	4,885,690	9,799,427
2016	4,674,717	-	-	4,674,717	443,857	5,118,574	4,975,911	324,269	5,300,179	5,377,433	10,796,725
2017	5,139,472	-	-	5,139,472	591,226	5,730,697	5,504,064	471,638	5,975,701	6,062,801	12,125,602
2018	5,211,953	-	-	5,211,953	616,186	5,828,139	5,585,759	491,549	6,077,308	6,165,889	12,331,778
2019	5,284,434	81,412	-	5,365,845	641,146	6,006,992	5,752,347	511,461	6,263,808	6,355,107	12,710,214
2020	5,356,915	138,365	-	5,495,279	666,106	6,161,386	5,893,431	531,372	6,424,803	6,518,448	13,036,896
2021	5,429,396	212,495	-	5,641,890	691,067	6,332,957	6,052,425	551,283	6,603,709	6,699,962	13,399,924
2022	5,501,877	260,960	-	5,762,837	716,027	6,478,864	6,184,659	571,195	6,755,854	6,854,325	13,708,650
2023	5,596,213	331,705	-	5,927,918	744,942	6,672,860	6,363,883	594,261	6,958,144	7,059,564	14,119,128
2024	5,690,550	378,858	-	6,069,408	773,857	6,843,264	6,518,506	617,327	7,135,834	7,239,843	14,479,686
2025	5,784,887	412,300	-	6,197,187	802,772	6,999,959	6,658,833	640,394	7,299,227	7,405,618	14,811,236
2026	5,879,224	500,729	-	6,379,952	831,687	7,211,639	6,856,497	663,460	7,519,957	7,629,565	15,259,130
2027	5,973,560	583,590	-	6,557,150	860,601	7,417,751	7,048,355	686,526	7,734,881	7,847,623	15,695,246
2028	6,102,818	636,681	-	6,739,499	892,425	7,631,925	7,246,298	711,913	7,958,211	8,074,208	16,148,416
2029	6,232,076	716,761	-	6,948,837	924,249	7,873,086	7,472,383	737,300	8,209,683	8,329,345	16,658,690
2030	6,361,334	780,393	-	7,141,727	956,073	8,097,800	7,681,318	762,687	8,444,004	8,567,081	17,134,162
2031	6,490,592	861,580	-	7,352,172	987,897	8,340,069	7,908,557	788,074	8,696,631	8,823,390	17,646,780
2032	6,619,849	917,605	-	7,537,455	1,019,721	8,557,176	8,109,559	813,460	8,923,019	9,053,079	18,106,158
2033	6,751,675	1,006,313	-	7,757,988	1,055,712	8,813,700	8,348,340	842,172	9,190,511	9,324,469	18,648,938
2034	6,883,501	1,068,921	-	7,952,422	1,091,704	9,044,126	8,559,905	870,883	9,430,788	9,568,248	19,136,496
2035	7,015,327	1,153,727	72,968	8,242,022	1,127,695	9,369,716	8,870,705	899,594	9,770,299	9,912,707	19,825,414
2036	7,147,153	1,261,804	537,045	8,946,002	1,163,686	10,109,688	9,613,601	928,305	10,541,906	10,695,562	21,391,124
2037	7,278,978	1,343,827	826,432	9,449,237	1,199,677	10,648,915	10,147,170	957,016	11,104,186	11,266,037	22,532,074
					Compounded Annual Growth Rate						
2016-2037	2.1%			3.4%	4.8%	3.6%	3.5%	5.3%	3.6%	3.6%	3.6%

(a) Table D.4. Intermediate years interpolated.
(b) Table E.5.
(c) Table E.8.
(d) Total enplanements less international enplanements.
(e) Assumes 4.1 percent connecting percentage throughout forecast period.

Sources: As noted and HNTB analysis.

APPENDIX F: SJC PASSENGER AIRCRAFT OPERATIONS FORECAST

This appendix provides the detailed calculations used to derive the forecast of scheduled domestic and international aircraft departures at SJC from the passenger enplanement forecasts. As noted in Section 6, the following steps were applied:

a) Project domestic and international load factors using FAA growth rates.

b) Project seat departures by dividing the passenger enplanement forecasts by the load factor forecasts.

c) Estimate future SJC nonstop markets.

d) Allocate projected seat departures among existing and future nonstop SJC markets.

e) Estimate the most probable way in which airlines would accommodate the seat departure forecasts in terms of aircraft type and frequency of service.

Load Factor and Seat Departure Forecasts

Table F.1 provides the forecasts of domestic and international load factors for SJC. As noted in Section 4, SJC load factors were assumed to grow at the same rate as the FAA's forecast of national load factors. In **Table F.2**, the load factor forecasts are applied to the SJC passenger enplanement forecasts to calculate projected passenger aircraft seat departures.

New Nonstop Markets

A critical element of the forecasts is the determination of new nonstop markets from SJC. Candidate markets for nonstop domestic air carrier service were determined by identifying the current thresholds of total revenue (originations multiplied by average fare) that justified nonstop service to SJC. A market's total revenue includes revenue from all originating passengers at the market and is therefore a better measure of the market's value to the airline than just originating revenue to SJC, which can be biased by the availability or lack of existing nonstop service. Thresholds are typically lower for nearby markets than more distant markets because service can be offered with smaller aircraft and because there is less competition from connecting hubs between the two markets.

Table F.3 presents the estimated thresholds for nonstop SJC service to domestic markets. Thresholds of revenue necessary to justify nonstop service were estimated using the average of revenue in the smallest market with nonstop service and the largest market without nonstop service in each mileage band (100-500 miles, 501-700 miles, 701-1500 miles, etc.). These thresholds are in large part determined by aircraft capabilities. For example, there is a big jump in the threshold above 1,500 miles because that is beyond the capability of most regional jets. Therefore, these more distant markets would need to be large enough to justify mainline aircraft.

Note that no thresholds were calculated for markets less than 100 miles distant from SJC. There are several large markets within this band, such as San Francisco, Oakland, and Sacramento. However, it is

impractical for airlines to compete with automobiles and other surface modes at this distance, so these markets were not included in the analysis.

Revenue in each market was projected to increase at the same rate as the FAA forecast of domestic airline revenue. The estimated thresholds for domestic nonstop service and the projected new nonstop SJC markets through 2037 are shown in **Table F.4**. Markets that have exceeded the threshold are shaded in light green in the table. Often there is a delay in the time an airline recognizes a market and can allocate an aircraft to serve the market. Therefore, a delay of five years was assumed between the time a market achieved the nonstop threshold and the time nonstop service was implemented. Markets shaded in dark green are assumed to have nonstop service. By 2037, the additional traffic resulting from SFO and OAK diversions are assumed to make SJC sufficiently attractive to eliminate the five-year delay.

The approach used to estimate new nonstop international markets was similar to that used for domestic markets. Using airline revenue data for international markets data, thresholds for international nonstop service were identified and used to estimate new nonstop markets (**Table F.5**). Revenue in each market was projected to increase at the same rate as the FAA forecast of international airline revenue for the applicable region. The estimated thresholds for international nonstop service and the projected new nonstop international SJC markets through 2037 are shown in **Table F.6**.

Seat Departure Forecast by Market

The seat departure projections from **Table F.2** were allocated among existing nonstop markets in accordance with their existing shares of seat departures. Seat departures to new nonstop markets were estimated based on seat departures to the most similar existing nonstop market. The individual market seat departure projections were adjusted proportionately to sum to the **Table F.2** forecasts. **Tables F.7** and **F.8** show the forecasts of passenger aircraft seat departures by market for domestic and international markets, respectively.

The individual markets vary in their seasonal characteristics. Most markets have summer peaks, but some vacation markets have winter peaks. The design day seat departure forecasts in **Tables F.9** and **F.10** reflect current summer seasonal distributions for existing nonstop markets. Seasonal distributions for new nonstop markets were based on the most similar existing nonstop market.

Aircraft Departure Projections by Market

The seat departure projections from **Tables F.7** and **F.8** were translated into projections of scheduled aircraft flights for each market using a set of assumptions regarding airline strategies and available equipment. The fleet projections are guided by the general assumptions outlined in Section 4. Based on current airline schedule data, airline fleet plans, industry publications, and professional experience, additional, more detailed air service assumptions were developed, as listed below:

- No radical changes in airline strategy for how to serve and compete in markets is assumed.
- The current pattern of airline dominance at other airport hubs and non-hubs is assumed to remain substantially in place.

- The current airline alliance structure is assumed to remain intact.
- Southwest Airlines is assumed to retire its Boeing 737-300 aircraft before 2022. It is anticipated to add more Boeing 737-800 aircraft and introduce Boeing 737-7 MAX and Boeing 737-8 MAX aircraft by 2022. The share of aircraft departures performed by Boeing MAX aircraft is then projected to gradually increase through the forecast period.
- Alaska Airlines is assumed to retire its remaining Boeing 737-400 aircraft before 2022. It will gradually supplement its Boeing 737-700, -800, and -900 fleet with the Boeing 737-8 MAX and 737-9 MAX aircraft it has on order by 2022. Although it is anticipated to integrate some Virgin America Airbus A319 and A320 aircraft into its fleet, it is anticipated that it will continue to serve SJC mostly with Boeing aircraft through the forecast period.
- Horizon Airlines is expected to supplement its Bombardier Q400 turboprop fleet with the Embraer 175 aircraft on order beginning in 2017.
- Based on recent trends and fleet plans, the following changes in the Delta Air Lines fleet are projected:
    - Replacement of 50-seat regional jets with service by larger 76-seat jets, mostly Embraer 175 and CRJ-900 aircraft.
    - Replacement of most 757 aircraft with Boeing 737-900ER and Airbus A321 aircraft.
    - Gradual retirement of MD-90 aircraft over the forecast period.
    - Retirement of Boeing 717s after 2030, replaced by the Bombardier C-Series aircraft.
- American Airlines is expected to eliminate its MD-80 aircraft before 2022, and supplement its existing Boeing and Airbus fleet with large numbers of newer Boeing 737-8 MAX and Airbus 321neo aircraft.
- United Airlines is expected to augment its fleet with new Boeing 737-700 and Boeing 737-9 MAX on order.
- JetBlue is projected to supplement its A320 service with operations by A321 and Airbus neo aircraft.
- Spirit Airlines is projected to begin service at SJC with Airbus 320 classic and 320 neo aircraft.
- Foreign flag carriers are assumed to operate aircraft currently in their fleet or on order.
- Aircraft retirement projections are based on the age of the aircraft in each airline fleet when no published information on aircraft retirements is available.
- Future fleet additions beyond those presently announced by the airlines are assumed to be consistent with current announced fleet expansion plans and existing acquisitions.

Using the above assumptions for guidance, air service scenarios were developed for each market in each forecast year. The scenarios were developed so that the selected aircraft types and frequencies in combination matched the seat departure projections for that market. Factors considered in each market

included historical service patterns, current dominant carriers, aircraft in place and on order, length of haul, and announced plans of current carriers and new entrants.

The air service projections are presented in **Table F.11**. The table shows annual seat departure projections for each market ("Target Seat Departures" highlighted in green), and then shows anticipated aircraft departures by airline and equipment type for each market. The aircraft departure projections were aggregated to generate the passenger fleet mix forecasts and the passenger aircraft operations forecasts. The air service projections will also be used as the basis for preparing the future design day flight schedule.

Fleet Mix and Aircraft Departures Forecasts

Table F.12 shows the projected domestic and international fleet mix forecasts for each forecast year. By 2037 the predominant aircraft in domestic service are projected to be the Boeing 737-7 MAX, the Boeing 737-8 MAX, the Boeing 737-800, the Boeing 737-9 MAX, the Bombardier CS-100, and the Embraer 175. Internationally, by 2037 it is anticipated that the Canadian and Mexican markets will be served primarily with Boeing 737 MAX and Airbus neo aircraft. Overseas flights will be served mostly by A330 and A350 aircraft, along with Boeing 787 aircraft and a few Boeing 777s.

Table F.1 – Forecast of SJC Load Factors

	Average Load Factors			
	SJC (a)		FAA (b)	
Year	Domestic	International	Domestic	International
2015	78.0	76.1	84.5	80.8
2016	76.0	77.1	85.1	81.9
2017	76.2	77.1	85.3	81.9
2018	76.4	77.1	85.5	81.9
2019	76.5	77.1	85.6	81.9
2020	76.6	77.1	85.7	81.9
2021	76.7	77.1	85.8	81.9
2022	76.7	77.1	85.9	81.9
2023	76.8	77.1	86.0	81.9
2024	76.8	77.0	86.0	81.8
2025	76.9	77.0	86.1	81.8
2026	76.9	77.0	86.1	81.8
2027	77.0	77.0	86.2	81.8
2028	77.0	77.0	86.2	81.8
2029	77.1	77.0	86.3	81.8
2030	77.1	77.0	86.3	81.8
2031	77.1	77.0	86.3	81.8
2032	77.2	77.0	86.4	81.8
2033	77.2	77.0	86.4	81.8
2034	77.2	77.0	86.4	81.8
2035	77.2	77.0	86.4	81.8
2036	77.3	77.0	86.5	81.8
2037	77.3	77.0	86.5	81.8

(a) 2016 load factors based on US DOT T100 data as compiled by Database Products extrapolated from partial data. Assumed to increase at same rate as FAA forecasts.
(b) FAA Aerospace Forecasts: Fiscal Years 2016-2036. Table 6.

Sources: As noted and HNTB analysis.

Table F.2 – Forecast of SJC Seat Departures

	Domestic			International		
Year	Enplanements (a)	Load Factor (b)	Seat Departures (c)	Enplanements (a)	Load Factor (b)	Seat Departures (c)
2015	4,624,709	78.0	5,934,209	192,681	76.1	253,605
2016	4,975,911	76.0	6,544,667	324,269	77.1	420,386
2017	5,504,064	76.2	7,222,357	471,638	77.1	611,436
2018	5,585,759	76.4	7,312,412	491,549	77.1	637,250
2019	5,752,347	76.5	7,521,698	511,461	77.1	663,063
2020	5,893,431	76.6	7,697,185	531,372	77.1	688,877
2021	6,052,425	76.7	7,895,629	551,283	77.1	714,690
2022	6,184,659	76.7	8,058,740	571,195	77.1	740,503
2023	6,363,883	76.8	8,282,631	594,261	77.1	770,407
2024	6,518,506	76.8	8,483,874	617,327	77.0	801,289
2025	6,658,833	76.9	8,656,445	640,394	77.0	831,228
2026	6,856,497	76.9	8,913,406	663,460	77.0	861,168
2027	7,048,355	77.0	9,152,191	686,526	77.0	891,108
2028	7,246,298	77.0	9,409,217	711,913	77.0	924,060
2029	7,472,383	77.1	9,691,543	737,300	77.0	957,012
2030	7,681,318	77.1	9,962,527	762,687	77.0	989,964
2031	7,908,557	77.1	10,257,253	788,074	77.0	1,022,916
2032	8,109,559	77.2	10,505,774	813,460	77.0	1,055,868
2033	8,348,340	77.2	10,815,110	842,172	77.0	1,093,135
2034	8,559,905	77.2	11,089,189	870,883	77.0	1,130,403
2035	8,870,705	77.2	11,491,824	899,594	77.0	1,167,670
2036	9,613,601	77.3	12,439,833	928,305	77.0	1,204,937
2037	10,147,170	77.3	13,130,262	957,016	77.0	1,242,204
Compounded Annual Growth Rate						
2016-2037	3.5%		3.4%	5.3%		5.3%

(a) Table E.9.
(b) Table F.1.
(c) enplanements divided by load factor.

Sources: As noted and HNTB analysis.

Table F.3 – Revenue Thresholds for Domestic Nonstop Service at SJC: 2015

Geographic Category	Revenue (a)				
	Lowest With (b)		Highest Without (c)		Average (d)
100-500 Miles	EUG	70,627,890	PSP	144,829,596	107,728,743
501-700 Miles	BOI	235,679,233	PSC	61,239,854	148,459,543
701-1500 Miles	DAL	627,226,944	MCI	755,168,740	691,197,842
1501-3000 Miles	MDW	877,959,334	MCO	2,165,774,731	1,521,867,032
Hawaii	KOA	280,897,704	ITO	73,473,101	177,185,403

(a) USDOT O&D data as compiled by Database Products. Includes all domestic airline revenue in market.
(b) Lowest revenue market in geographic category with non-stop service to SJC.
(c) Highest revenue market in geographic category without non-stop service to SJC.
(d) Average revenue of lowest revenue market with non-stop service and highest revenue market without non-stop service.

Sources: As noted and HNTB analysis.

Table F.4 – Estimated New Domestic Nonstop Markets at SJC

Geographic Category	2015		2022	2027	2032	2037	
US Average Domestic Fare (2015 dollars) (a)	$130.27		$132.62	$133.94	$130.61	$128.08	
US Domestic Enplanements (millions) (a)	696.00		815.00	878.00	971.00	1,072.00	
US Domestic Airline Revenue (billions of 2015 dollars) (b)	$90.7		$108.1	$117.6	$126.8	$137.3	
100-500 Miles **Threshold (c)**	**107,728,743**		**107,728,743**	**107,728,743**	**107,728,743**	**107,728,743**	
PSP Palm Springs Regional Airport	144,829,596	(d)	172,653,305	187,854,527	202,579,316	219,312,423	
FAT Fresno Yosemite International Airport	119,409,455	(d)	142,349,614	154,882,754	167,023,083	180,819,236	
SBA Santa Barbara Airport	69,306,441	(d)	82,621,139	89,895,499	96,941,867	104,949,292	
MFR Medford Jackson County	61,355,204	(d)	73,142,362	79,582,166	85,820,134	92,908,900	
501-700 Miles **Threshold (c)**	**148,459,543**		**148,459,543**	**148,459,543**	**148,459,543**	**148,459,543**	
PSC Tri Cities (Pasco)	61,239,854	(d)	73,004,852	79,432,548	85,658,788	92,734,228	
AZA Phoenix-Mesa Gateway Airport	57,074,085	(d)	68,038,782	74,029,242	79,831,950	86,426,091	
IDA Fanning Field	32,267,969	(d)	38,467,079	41,853,905	45,134,581	48,862,710	
701-1500 Mile: **Threshold (c)**	**691,197,842**		**691,197,842**	**691,197,842**	**691,197,842**	**691,197,842**	
MCI Kansas City International Airport	755,168,740	(d)	900,246,789	979,508,820	1,056,286,636	1,143,536,204	
SAT San Antonio International Airport	654,359,125	(d)	780,070,294	848,751,412	915,279,940	990,882,315	
ABQ Albuquerque International Airport	371,041,478	(d)	442,323,525	481,267,803	518,991,497	561,860,337	
1501-3000 Mil **Threshold (c)**	**1,521,867,032**		**1,521,867,032**	**1,521,867,032**	**1,521,867,032**	**1,521,867,032**	
MCO Orlando International Airport	2,165,774,731	(d)	2,581,849,121	2,809,167,462	3,029,361,234	3,279,587,306	
LGA New York - La Guardia Airport	2,080,438,730	(d)	2,480,118,930	2,698,480,458	2,909,998,140	3,150,364,788	(e)
DCA Washington - Reagan National Airport	1,586,422,992	(d)	1,891,196,139	2,057,706,089	2,218,997,315	2,402,287,105	(e)
PHL Philadelphia International Airport	1,552,096,011	(d)	1,850,274,484	2,013,181,496	2,170,982,707	2,350,306,477	
DTW Detroit Metropolitan Wayne County Airport	1,394,310,247	(d)	1,662,175,957	1,808,521,875	1,950,281,047	2,111,374,799	
FLL Fort Lauderdale - Hollywood International Airport	1,332,073,528	(d)	1,587,982,729	1,727,796,321	1,863,227,901	2,017,131,040	
TPA Tampa International Airport	1,196,775,540	(d)	1,426,692,182	1,552,304,983	1,673,980,851	1,812,252,131	
MIA Miami International Airport	1,052,178,681	(d)	1,254,316,326	1,364,752,332	1,471,727,074	1,593,292,136	
IAD Washington - Dulles International Airport	858,708,122	(d)	1,023,677,476	1,113,806,935	1,201,111,574	1,300,323,721	
Hawaii **Threshold (c)**	**177,185,403**		**177,185,403**	**177,185,403**	**177,185,403**	**177,185,403**	
ITO Hilo International Airport	73,473,101	(d)	87,588,270	95,299,960	102,769,952	111,258,778	
LNY Lanai Airport	2,749,681	(d)	3,277,931	3,566,536	3,846,095	4,163,784	

(a) Table B.3.
(b) Airline revenue estimated by multiplying average domestic U.S. fare by domestic U.S. enplanements.
(c)Table F.3.
(d) Base year airline revenue from US DOT O&D Survey as compiled by Database Products. Assumed to increase at same rate as U.S. airline revenue.
Markets/years shaded in green indicate that the market revenue has exceeded the threshold and is a candidate for nonstop service.
(e) No nonstop service assumed because of perimeter rule.

Sources: As noted and HNTB analysis.

Table F.5 – Revenue Thresholds for International Nonstop Service at SJC: 2015

Geographic Category	Revenue (a) Lowest With (b)		Highest Without (c)		Average (d)	
Canada (<1500 Miles)	YVR	570,461,322	YYC	347,248,700	458,855,011	
Canada (1501 to 3000 Miles)	N/A	N/A	YYZ	1,107,051,682	1,521,867,032	(e)
Mexico (<1500 Miles)	SJD	256,688,631	MZT	28,342,203	142,515,417	
Mexico/Latin America (1501-300 Miles)	GDL	289,058,389	CUN	926,259,188	1,521,867,032	(f)
Trans-Pacific	PVG	1,094,456,819	HKG	1,673,488,620	1,383,972,720	
Other Long-Haul	FRA	1,731,266,304	CDG	1,678,515,244	1,704,890,774	

(a) USDOT O&D data as compiled by Database Products. Includes all airline revenue from US flights to market.
(b) Lowest revenue market in geographic category with non-stop service to SJC.
(c) Highest revenue market in geographic category without non-stop service to SJC.
(d) Average revenue of lowest revenue market with non-stop service and highest revenue market without non-stop service.
(e) Assumed to be the same as threshold in U.S. 1501-3000 Mile band (see Table F.3).
(f) GDL appears to be an outlier, so assumed to be the same as threshold in U.S. 1501-3000 Mile band.

Sources: As noted and HNTB analysis.

Table F.6 – Estimated New International Nonstop Markets at SJC

Geographic Category		2015		2022	2027	2032	2037	
Canada								
US Domestic Airline Revenue (billions of 2015 dollars) (a)		$90.7		$108.1	$117.6	$126.8	$137.3	
< 1500 Miles	**Threshold (b)**	**458,855,011**		**458,855,011**	**458,855,011**	**458,855,011**	**458,855,011**	
YYC	Calgary International Airport	347,248,700	(c)	413,959,835	450,406,838	485,711,526	525,831,432	
YEG	Edmonton International Airport	149,491,167	(c)	178,210,427	193,900,925	209,099,654	226,371,343	
YWG	Winnipeg Richardson International Airport	68,781,547	(c)	81,995,406	89,214,673	96,207,676	104,154,456	
1501-3000 Miles	**Threshold (b)**	**1,521,867,032**		**1,521,867,032**	**1,521,867,032**	**1,521,867,032**	**1,521,867,032**	
YYZ	Pearson International Airport	1,107,051,682	(c)	1,319,731,167	1,435,926,608	1,548,480,274	1,676,385,172	
YUL	Pierre Elliott Trudeau International Airport	412,288,287	(c)	491,494,400	534,767,917	576,685,163	624,319,517	
YOW	Ottawa/Macdonald-Cartier International Airport	97,591,881	(c)	116,340,591	126,583,773	136,505,915	147,781,341	
Mexico/Latin America								
Revenue Passenger Miles (billions) (d)		81		112	141	173	211	
Yield (2015 cents per mile) (e)		14.50		12.84	12.32	11.87	11.37	
Airline Revenue (billions of 2015 dollars) (f)		11.75		14.38	17.37	20.54	23.99	
(<1500 Miles)	**Threshold (b)**	**142,515,417**		**142,515,417**	**142,515,417**	**142,515,417**	**142,515,417**	
MZT	Mazatlan - General Rafael Buelna International Airport	28,342,203	(c)	34,702,729	41,918,950	49,553,850	57,892,659	
CUU	Chihuahua - General Fierro Villalobos Airport	16,358,889	(c)	20,030,133	24,195,277	28,602,079	33,415,172	
1501-3000 Miles	**Threshold (b)**	**1,521,867,032**		**1,521,867,032**	**1,521,867,032**	**1,521,867,032**	**1,521,867,032**	
CUN	Cancun International Airport	926,259,188	(c)	1,134,129,258	1,369,964,547	1,619,482,763	1,892,005,645	
MEX	Mexico City International Airport - Benito Jurez	736,723,583	(c)	902,058,280	1,089,635,819	1,288,096,419	1,504,854,360	
MBJ	Montego Bay - Sangster International Airport	292,818,713	(c)	358,532,767	433,087,478	511,967,778	598,120,553	
(>3000 Miles)	**Threshold (b)**	**1,704,890,774**		**1,704,890,774**	**1,704,890,774**	**1,704,890,774**	**1,704,890,774**	
GRU	Sao Paulo - Guarulhos International Airport	915,262,253	(c)	1,120,664,403	1,353,699,758	1,600,255,589	1,869,542,966	
EZE	Buenos Aires	695,882,769	(c)	852,052,016	1,029,231,057	1,216,689,847	1,421,431,652	
Pacific								
Revenue Passenger Miles (billions) (d)		71		87	100	114	129	
Yield (2015 cents per mile) (e)		13.21		12.01	11.70	11.43	11.17	
Airline Revenue (billions of 2015 dollars) (f)		9.38		10.45	11.70	13.03	14.41	
(>3000 Miles)	**Threshold (b)**	**1,383,972,720**		**1,383,972,720**	**1,383,972,720**	**1,383,972,720**	**1,383,972,720**	
HKG	Hong Kong International Airport	1,673,488,620	(c)	1,864,334,589	2,087,600,821	2,324,944,975	2,571,014,231	
ICN	Seoul - Incheon International Airport	1,637,546,328	(c)	1,824,293,409	2,042,764,448	2,275,011,052	2,515,795,364	
TPE	Taipei - Chiang Kai Shek International Airport	741,920,360	(c)	826,529,546	925,511,852	1,030,735,430	1,139,827,173	
SYD	Sydney International Airport	672,721,800	(c)	749,439,527	839,189,801	934,599,226	1,033,516,034	
Other Long-Haul (Atlantic)								
Revenue Passenger Miles (billions) (d)		107		136	158	181	206	
Yield (2015 cents per mile) (e)		14.64		13.99	13.64	13.30	12.97	
Airline Revenue (billions of 2015 dollars) (f)		15.66		19.03	21.55	24.07	26.72	
(>3000 Miles)	**Threshold (b)**	**1,704,890,774**		**1,704,890,774**	**1,704,890,774**	**1,704,890,774**	**1,704,890,774**	
CDG	Paris - Charles De Gaulle Airport	1,678,515,244	(c)	2,038,717,535	2,309,255,000	2,579,471,009	2,862,909,580	
DXB	Dubai Airport	1,490,999,726	(c)	1,810,961,978	2,051,276,320	2,291,305,118	2,543,079,317	(g)
AMS	Amsterdam Airport Schiphol	935,956,823	(c)	1,136,809,209	1,287,663,595	1,438,338,734	1,596,386,905	

(a) Growth assumed to be the same as U.S. From Table F.4.
(b) Table F.5.
(c) Base year airline revenue from US DOT O&D Survey as compiled by Database Products. Assumed to increase at same rate as U.S. airline revenue. Markets/years shaded in green indicate that the market revenue has exceeded the threshold and is a candidate for nonstop service.
(d) FAA Aerospace Forecasts: Fiscal Years 2016-2036. Table 13.
(e) FAA Aerospace Forecasts: Fiscal Years 2016-2036. Table 16.
(f) Revenue passenger miles multiplied by yield.
(g) Distance makes market only marginally feasible.

Sources: As noted and HNTB analysis.

Table F.7 – Forecast of Domestic Passenger Aircraft Seat Departures

Markets	Airport Code	2013	2014	2015	2022	2027	2032	2037
Projected Seat Departures (a)		5,642,558	5,815,754	5,934,209	8,058,740	9,152,191	10,505,774	13,130,262
Existing Nonstop Markets (b)								
Atlanta - Hartsfield-Jackson International Airport	ATL	50,936	54,036	52,497	113,959	127,017	144,792	180,314
Austin-Bergstrom International Airport	AUS	95,704	96,977	103,719	123,962	138,166	157,501	196,141
Boise Airport	BOI	27,588	27,284	27,360	32,700	36,447	41,547	51,740
Boston - Logan International Airport	BOS	33,300	33,150	34,200	40,875	45,558	51,934	64,675
Burbank - Bob Hope Airport	BUR	357,403	328,919	323,343	386,451	430,730	491,008	611,468
Chicago - OHare Airport	ORD	101,352	107,440	108,869	223,402	248,999	283,844	353,480
Chicago Midway Airport	MDW	51,291	49,997	52,489	62,733	69,921	79,706	99,261
Dallas Love Field	DAL	-	-	48,438	111,038	123,760	141,080	175,691
Dallas/Fort Worth International Airport	DFW	239,597	239,226	231,412	276,578	308,267	351,407	437,619
Denver International Airport	DEN	292,357	300,408	299,514	357,971	398,987	454,823	566,405
Eugene - Mahlon Sweet Field	EUG			4,332	29,316	32,675	37,248	46,386
Honolulu International Airport	HNL	91,692	104,270	135,597	162,062	180,631	205,909	256,425
Houston - Bush Intercontinental Airport	IAH	96,926	94,397	78,770	59,425	66,234	75,503	94,026
Kahului Airport	OGG	149,386	150,387	153,814	183,834	204,898	233,572	290,875
Kona International at Keahole	KOA	35,011	26,127	34,969	41,794	46,583	53,102	66,129
Las Vegas - McCarran International Airport	LAS	438,202	450,198	445,770	611,954	682,071	777,523	968,274
Lihue Airport	LIH	40,349	32,990	34,230	40,911	45,598	51,979	64,732
Los Angeles Airport	LAX	876,785	880,799	821,836	944,813	1,053,069	1,200,439	1,494,944
Minneapolis-St Paul International Airport	MSP	85,074	82,239	82,971	99,165	110,527	125,994	156,905
New York - John F Kennedy International Airport	JFK	49,050	44,850	47,700	57,010	63,542	72,434	90,205
Ontario International Airport	ONT	227,432	204,405	201,929	241,340	268,993	306,636	406,864
Phoenix Sky Harbor International Airport	PHX	479,080	477,118	490,580	586,328	653,509	744,963	927,726
Portland International Airport	PDX	359,339	386,394	385,887	461,202	514,046	585,983	729,743
Reno/Tahoe International Airport	RNO	45,059	48,944	51,947	62,086	69,199	78,883	98,236
Salt Lake City International Airport	SLC	119,636	158,375	168,795	294,246	327,960	373,856	465,575
San Diego International Airport	SAN	462,457	466,004	467,625	581,299	647,903	738,573	919,768
Santa Ana - John Wayne Airport	SNA	398,621	414,695	423,120	531,163	592,023	674,872	840,440
Seattle/Tacoma International Airport	SEA	414,778	543,643	598,413	715,207	797,155	908,712	1,131,647
New Nonstop Markets (since 2015) (c)								
Charlotte - Douglas International Airport	CLT	187	-	-	45,625	49,466	57,969	70,223
Baltimore/Washington International Airport	BWI	-	-	-	55,519	61,880	70,540	87,846
Newark International Airport	EWR	-	150	-	118,990	129,009	151,184	183,142
Long Beach Airport	LGB	150			210,361	234,464	267,276	307,847
Palm Springs Regional Airport	PSP	8,688	124		6,703	7,268	8,517	10,317
Fresno Yosemite International Airport	FAT	605	256	170		6,703	7,499	9,516
Kansas City International Airport	MCI	143	-	-	51,151	55,458	64,990	78,728
San Antonio International Airport	SAT	278	120	694		51,151	57,226	72,614
Orlando International Airport	MCO	-	-	-	65,101	70,583	82,715	100,200
Philadelphia International Airport	PHL	337	-	-	44,713	48,477	56,810	68,819
Detroit Metropolitan Wayne County Airport	DTW	-	-	-		57,232	64,029	81,247
Fort Lauderdale - Hollywood International Airport	FLL	-	-	-		65,101	72,833	92,418
Tampa International Airport	TPA	-	-	-			65,101	80,511
Miami International Airport	MIA	-	-	-				57,232
Other Domestic	MISC	13,765	11,832	23,219	27,751	30,930	35,259	43,909
Total		5,642,558	5,815,754	5,934,209	8,058,740	9,152,191	10,505,774	13,130,262

(a) Table F.2.
(b) Assumed to increase at same rate as projected seat departures with adjustment for new nonstop markets.
(c) Based on existing announcements and threshold analysis in Table F.4.

Sources: As noted and HNTB analysis.

Table F.8 – Forecast of International Passenger Aircraft Seat Departures

Markets	Airport Code	2013	2014	2015	2022	2027	2032	2037
Projected Seat Departures (a)		194,143	212,542	253,605	740,503	891,108	1,055,868	1,242,204
Existing Nonstop Markets (b)								
Beijing - Capital International Airport	PEK			22,354	59,122	64,794	72,862	79,772
Guadalajarra-Don Miguel Hidalgo Airport	GDL	112,896	112,859	118,503	177,991	195,066	219,355	240,157
San Jos del Cabo Airport	SJD	48,246	39,729	49,261	73,990	81,088	91,184	99,832
Tokyo - Narita International Airport	NRT	32,489	59,954	62,206	93,433	102,396	115,146	126,066
New Nonstop Markets (since 2015) (c)								
Vancouver International Airport	YVR	-	-	-	57,488	63,002	70,847	77,566
London - Heathrow Airport	LHR	-	-	-	83,087	91,057	102,395	112,106
Shanghai - Pudong International	PVG	-	-	-	39,505	43,294	48,685	53,302
Frankfurt am Main International	FRA	-	-	-	66,780	73,186	82,299	90,104
Calgary International Airport	YYC	-	-	-			53,802	58,904
Pearson International Airport	YYZ	-	-	-				53,802
Cancun International Airport	CUN	-	-	-				32,400
Hong Kong International Airport	HKG	-	-	-	43,800	48,002	53,979	59,098
Seoul - Incheon International Airport	ICN	-	-	-		79,570	89,478	97,963
Paris - Charles De Gaulle Airport	CDG	-	-	-	43,383	47,544	53,465	58,535
Other International	MISC	512	-	1,281	1,924	2,109	2,371	2,596
Total		194,143	212,542	253,605	740,503	891,108	1,055,868	1,242,204

(a) Table F.2.
(b) Assumed to increase at same rate as projected seat departures with adjustment for new nonstop markets.
(c) Based on existing announcements and threshold analysis in Table F.6.

Sources: As noted and HNTB analysis.

Table F.9 – Design Day Passenger Aircraft Seat Departures - Domestic

Markets	Airport Code	2016	2022	2027	2032	2037	
Existing Nonstop Markets (a)							
Atlanta - Hartsfield-Jackson International Airport	ATL	320	383	427	487	606	
Austin-Bergstrom International Airport	AUS	318	381	425	484	603	
Boise Airport	BOI	76	91	101	116	144	
Boston - Logan International Airport	BOS	150	180	200	228	284	
Burbank - Bob Hope Airport	BUR	1001	1199	1336	1523	1897	
Chicago - OHare Airport	ORD	480	575	641	730	910	
Chicago Midway Airport	MDW	143	171	191	218	271	
Dallas Love Field	DAL	286	343	382	435	542	
Dallas/Fort Worth International Airport	DFW	800	958	1068	1217	1516	
Denver International Airport	DEN	1038	1243	1386	1580	1967	
Eugene - Mahlon Sweet Field	EUG	76	91	101	116	144	
Honolulu International Airport	HNL	422	505	563	642	800	
Houston - Bush Intercontinental Airport	IAH	150	180	200	228	284	
Kahului Airport	OGG	422	505	563	642	800	
Kona International at Keahole	KOA	181	181	181	181	181	(b)
Las Vegas - McCarran International Airport	LAS	1515	1815	2023	2306	2871	
Lihue Airport	LIH	0	181	181	181	181	(b)
Los Angeles Airport	LAX	2799	3353	3737	4260	5305	
Minneapolis-St Paul International Airport	MSP	320	383	427	487	606	
New York - John F Kennedy International Airport	JFK	150	180	200	228	284	
Ontario International Airport	ONT	572	685	764	870	1155	
Phoenix Sky Harbor International Airport	PHX	1596	1912	2131	2429	3025	
Portland International Airport	PDX	1297	1554	1732	1974	2458	
Reno/Tahoe International Airport	RNO	152	182	203	231	288	
Salt Lake City International Airport	SLC	630	755	841	959	1194	
San Diego International Airport	SAN	1658	1986	2213	2523	3142	
Santa Ana - John Wayne Airport	SNA	1515	1815	2023	2306	2871	
Seattle/Tacoma International Airport	SEA	2144	2568	2862	3263	4063	
New Nonstop Markets (since 2015) (c)							
Charlotte - Douglas International Airport	CLT	128	701	761	891	1080	
Baltimore/Washington International Airport	BWI	0	143	159	182	226	
Newark International Airport	EWR	0	326	353	414	502	
Long Beach Airport	LGB	0	600	669	762	878	
Palm Springs Regional Airport	PSP	0	0	0	0	0	(d)
Fresno Yosemite International Airport	FAT	0	0	76	85	108	
Kansas City International Airport	MCI	0	143	155	182	220	
San Antonio International Airport	SAT	0	0	143	160	203	
Orlando International Airport	MCO	0	182	197	231	280	
Philadelphia International Airport	PHL	0	125	136	159	192	
Detroit Metropolitan Wayne County Airport	DTW	0	0	160	179	227	
Fort Lauderdale - Hollywood International Airport	FLL	0	0	182	204	258	
Tampa International Airport	TPA	0	0	0	182	225	
Miami International Airport	MIA	0	0	0	0	160	
Total		20339	26575	30093	34475	42951	

(a) Assumed to increase at same rate as annual seat departures in Table F.7.
(b) Frequencies are currently less than one per day so growth assumed to occur by adding more weekly frequencies.
(c) Initial seat levels based on service announcements and similar markets, Assumed to increase at same rate as annual seat departures in Table F.7.
(d) No summer service assumed.

Sources: As noted and HNTB analysis.

Table F.10 – Design Day Passenger Aircraft Seat Departures - International

Markets	Airport Code	2016	2022	2027	2032	2037
Existing Nonstop Markets (a)						
Beijing - Capital International Airport	PEK	212	329	361	406	445
Guadalajarra-Don Miguel Hidalgo Airport	GDL	342	532	582	655	717
San Jos del Cabo Airport	SJD	181	281	308	347	380
Tokyo - Narita International Airport	NRT	169	263	288	324	354
New Nonstop Markets (since 2015) (c)						
Vancouver International Airport	YVR	150	233	255	287	315
London - Heathrow Airport	LHR	216	336	368	414	453
Shanghai - Pudong International	PVG	237	237	237	237	237 (b)
Frankfurt am Main International	FRA	298	298	298	298	298 (b)
Calgary International Airport	YYC	0	0	0	150	164
Pearson International Airport	YYZ	0	0	0	0	150
Cancun International Airport	CUN	0	0	0	0	0 (d)
Hong Kong International Airport	HKG	0	280	280	280	280 (b)
Seoul - Incheon International Airport	ICN	0	0	218	245	268
Paris - Charles De Gaulle Airport	CDG	0	208	208	208	208 (b)
Total		1805	2997	3403	3851	4269

(a) Assumed to increase at same rate as annual seat departures in Table F.8.
(b) Frequencies are currently less than one per day so growth assumed to occur by adding more weekly frequencies.
(c) Initial seat levels based on service announcements and similar markets, Assumed to increase at same rate as annual seat departures in Table F.8.
(d) No summer service assumed.

Sources: As noted and HNTB analysis.

Table F.11 - Forecast of Scheduled Passenger Aircraft Departures by Market (1 of 14)

Market	Dom/ Int	Airline	Equipment	Seats	Departures 2015	2022	2027	2032	2037	Seat Departures 2015	2022	2027	2032	2037
					Domestic									
Atlanta - Hartsfield-Jackson International Airport								Target Seat Departures (a)		52,497	113,959	127,017	144,792	180,314
ATL	D	DL	BOEING 737-700/700LR	124	1					124	-	-	-	-
ATL	D	DL	BOEING 737-800	160	151	712	730	56	278	24,159	113,915	116,795	8,960	44,478
ATL	D	DL	BOEING 757-200	182	97					17,702	-	-	-	-
ATL	D	DL	BOEING 757-300	234	18					4,212	-	-	-	-
ATL	D	DL	BOEING 737-900ER	180			57	365	365	-	-	10,260	65,700	65,700
ATL	D	DL	BOEING 737-900	180	35					6,300	-	-	-	-
ATL	D	DL	AIRBUS INDUSTRIE A321	192				365	365	-	-	-	70,080	70,080
			Subtotal		302	712	787	786	1008	52,497	113,915	127,055	144,740	180,258
Austin-Bergstrom International Airport								Target Seat Departures (a)		103,719	123,962	138,166	157,501	196,141
AUS	D	AA	MCDONNELL DOUGLAS MD80	140	1					140	-	-	-	-
AUS	D	AA	CANADAIR RJ-900	79	1					79	-	-	-	-
AUS	D	AA	EMBRAER-175	76	1					76	-	-	-	-
AUS	D	WN	BOEING 737-300	142	10					1,420	-	-	-	-
AUS	D	WN	BOEING 737-700/700LR	143	405					57,915	-	-	-	-
AUS	D	WN	BOEING 737-800	175	251	365				43,925	63,875	-	-	-
AUS	D	WN	BOEING 737-7 MAX	150		400	495	198	456	-	60,000	74,250	29,700	68,400
AUS	D	WN	BOEING 737-8 MAX	175			365	730	730	-	-	63,875	127,750	127,750
AUS	D	UA	BOEING 737-800	166	1					166	-	-	-	-
			Subtotal		670	765	860	928	1186	103,721	123,875	138,125	157,450	196,150
Baltimore/Washington International Airport								Target Seat Departures (a)		-	55,519	61,880	70,540	87,846
BWI	D	WN	BOEING 737-700/700LR	143		260				-	37,180	-	-	-
BWI	D	WN	BOEING 737-800	175						-	-	-	-	-
BWI	D	WN	BOEING 737-7 MAX	150			80	44	160	-	-	12,000	6,600	24,000
BWI	D	WN	BOEING 737-8 MAX	175		105	285	365	365	-	18,375	49,875	63,875	63,875
			Subtotal		0	365	365	409	525	-	55,555	61,875	70,475	87,875
Boise Airport								Target Seat Departures (a)		27,360	32,700	36,447	41,547	51,740
BOI	D	AS	DEHAVILLAND DHC8-400 DASH-8	76	360	365	365	365		27,360	27,740	27,740	27,740	-
BOI	D	AS	EMBRAER-175	76		65	114	182	681	-	4,940	8,664	13,832	51,756
			Subtotal		360	430	479	547	681	27360	32,680	36,404	41,572	51,756
Boston - Logan International Airport								Target Seat Departures (a)		34,200	40,875	45,558	51,934	64,675
BOS	D	B6	AIRBUS INDUSTRIE A320-100/200	150	228					34,200	-	-	-	-
BOS	D	B6	AIRBUS INDUSTRIE A320-100/200	162						-	-	-	-	-
BOS	D	B6	AIRBUS INDUSTRIE A321	190						-	-	-	-	-
BOS	D	B6	AIRBUS INDUSTRIE A320neo	162		252	281	320	168	-	40,824	45,522	51,840	27,216
BOS	D	B6	AIRBUS INDUSTRIE A321neo	190					197	-	-	-	-	37,430
			Subtotal		228	252	281	320	365	34,200	40,824	45,522	51,840	64,646

Table F.11 - Forecast of Scheduled Passenger Aircraft Departures by Market (2 of 14)

Market	Dom/ Int	Airline	Equipment	Seats	Departures 2015	2022	2027	2032	2037	Seat Departures 2015	2022	2027	2032	2037
Burbank - Bob Hope Airport								Target Seat Departures (a)		323,343	386,451	430,730	491,008	611,468
BUR	D	WN	BOEING 737-300	142	72					10,224	-	-	-	-
BUR	D	WN	BOEING 737-700/700LR	143	2185	2703	2180	2065		312,455	386,529	311,740	295,295	-
BUR	D	WN	BOEING 737-800	175	4			125		700	-	-	21,875	-
BUR	D	WN	BOEING 737-7 MAX	150				365	1355	-	-	-	54,750	203,250
BUR	D	WN	BOEING 737-8 MAX	175					1200	-	-	-	-	210,000
BUR	D	AS	BOEING 737-9 MAX	181					1095	-	-	-	-	198,195
BUR	D	AS	BOEING 737-800	163			730	730		-	-	118,990	118,990	-
			Subtotal		2261	2703	2910	3285	3650	323,379	386,529	430,730	490,910	611,445
Charlotte - Douglas International Airport								Target Seat Departures (a)		-	45,625	49,466	57,969	70,223
CLT	D	AA	AIRBUS INDUSTRIE A319	124		344	250	14		-	42,656	31,000	1,736	-
CLT	D	AA	AIRBUS INDUSTRIE A320-100/200	150		20				-	3,000	-	-	-
CLT	D	AA	BOEING 737-800	160						-	-	-	-	-
CLT	D	AA	BOEING 737-8 MAX	160			115	351	12	-	-	18,400	56,160	1,920
CLT	D	AA	AIRBUS INDUSTRIE A321	187						-	-	-	-	-
CLT	D	AA	AIRBUS INDUSTRIE A321neo	187					365	-	-	-	-	68,255
			Subtotal		0	364	365	365	377	0	45,656	49,400	57,896	70,175
Chicago - OHare Airport								Target Seat Departures (a)		108,869	223,402	248,999	283,844	353,480
ORD	D	AA	BOEING 737-800	154	705					108,570	-	-	-	-
ORD	D	AA	BOEING 737-8 MAX	160		705	799	987	730	-	112,800	127,840	157,920	116,800
ORD	D	AA	AIRBUS INDUSTRIE A321neo	187					365	-	-	-	-	68,255
ORD	D	UA	BOEING 737-800	166		666	730	365	227	-	110,556	121,180	60,590	37,682
ORD	D	UA	AIRBUS INDUSTRIE A319	128						-	-	-	-	-
ORD	D	UA	BOEING 737-700/700LR	118						-	-	-	-	-
ORD	D	UA	BOEING 737-900	179						-	-	-	-	-
ORD	D	UA	AIRBUS INDUSTRIE A320-100/200	150						-	-	-	-	-
ORD	D	UA	BOEING 737-9 MAX	179				365	730	-	-	-	65,335	130,670
			Subtotal		705	1371	1529	1717	2052	108,570	223,356	249,020	283,845	353,407
Chicago Midway Airport								Target Seat Departures (a)		52,489	62,733	69,921	79,706	99,261
MDW	D	WN	BOEING 737-700/700LR	143	323	37	489	365		46,189	5,291	69,927	52,195	-
MDW	D	WN	BOEING 737-800	175	36					6,300	-	-	-	-
MDW	D	WN	BOEING 737-7 MAX	150				183	661	-	-	-	27,450	99,150
MDW	D	WN	BOEING 737-8 MAX	175		328				-	57,400	-	-	-
			Subtotal		359	365	489	548	661	52,489	62,691	69,927	79,645	99,150
Dallas Love Field								Target Seat Departures (a)		48,438	111,038	123,760	141,080	175,691
DAL	D	WN	BOEING 737-300	142	6					852	-	-	-	-
DAL	D	WN	BOEING 737-700/700LR	143	252	365				36,036	52,195	-	-	-
DAL	D	WN	BOEING 737-800	175	66					11,550	-	-	-	-
DAL	D	WN	BOEING 737-7 MAX	150		365	825	940	637	-	54,750	123,750	141,000	95,550
DAL	D	WN	BOEING 737-8 MAX	175		23			458	-	4,025	-	-	80,150
			Subtotal		324	753	825	940	1095	48,438	110,970	123,750	141,000	175,700

Table F.11 - Forecast of Scheduled Passenger Aircraft Departures by Market (3 of 14)

Market	Dom/ Int	Airline	Equipment	Seats	Departures 2015	2022	2027	2032	2037	Seat Departures 2015	2022	2027	2032	2037
Dallas/Fort Worth International Airport								Target Seat Departures (a)		231,412	276,578	308,267	351,407	437,619
DFW	D	AA	BOEING 757-200	184	2					368	-	-	-	-
DFW	D	AA	BOEING 737-800	160		1397	365			-	223,520	58,400	-	-
DFW	D	AA	BOEING 737-8 MAX	160			1135	1770	1882	-	-	181,600	283,200	301,120
DFW	D	AA	AIRBUS INDUSTRIE A319	124		428				-	53,072	-	-	-
DFW	D	AA	AIRBUS INDUSTRIE A321	187			365			-	-	68,255	-	-
DFW	D	AA	AIRBUS INDUSTRIE A321neo	187				365	730	-	-	-	68,255	136,510
DFW	D	AA	MCDONNELL DOUGL DC9 SUPER 80/MD81/2/3/8	140	1619					226,660	-	-	-	-
DFW	D	AA	CANADAIR RJ-900	78	56					4,368	-	-	-	-
			Subtotal		1677	1825	1865	2135	2612	231,396	276,592	308,255	351,455	437,630
Denver International Airport								Target Seat Departures (a)		299,514	357,971	398,987	454,823	566,405
DEN	D	AA	BOEING 737-800	150	1					150	-	-	-	-
DEN	D	DL	MCDONNELL DOUGLAS MD-90	160	1					160	-	-	-	-
DEN	D	WN	BOEING 737-300	142	51					7,242	-	-	-	-
DEN	D	WN	BOEING 737-700/700LR	143	964	1095	730	730		137,852	156,585	104,390	104,390	-
DEN	D	WN	BOEING 737-800	175	177	365	365	365		30,975	63,875	63,875	63,875	-
DEN	D	WN	BOEING 737-7 MAX	150			365	365	1460	-	-	54,750	54,750	219,000
DEN	D	WN	BOEING 737-8 MAX	175					365	-	-	-	-	63,875
DEN	D	UA	CANADAIR RJ-200ER /RJ-440	50	274	100				13,700	5,000	-	-	-
DEN	D	UA	CANADAIR RJ-700	70	128					8,960	-	-	-	-
DEN	D	UA	EMBRAER-175	76	32	264	365	365		2,432	20,064	27,740	27,740	-
DEN	D	UA	AIRBUS INDUSTRIE A319	128	143	365	365			18,304	46,720	46,720	-	-
DEN	D	UA	AIRBUS INDUSTRIE A319 neo	128				945	1231	-	-	-	120,960	157,568
DEN	D	UA	AIRBUS INDUSTRIE A320-100/200	150	302	272	273	150		45,300	40,800	40,950	22,500	-
DEN	D	UA	BOEING 737-700/700LR	118	11					1,298	-	-	-	-
DEN	D	UA	BOEING 737-800	166	144	150	365	365	365	23,904	24,900	60,590	60,590	60,590
DEN	D	UA	BOEING 737-9 MAX	179					365	-	-	-	-	65,335
DEN	D	UA	BOEING 737-900	172	60					10,320	-	-	-	-
			Subtotal		2288	2611	2828	3285	3786	300,597	357,944	399,015	454,805	566,368
Detroit Metropolitan Wayne County Airport								Target Seat Departures (a)		-	-	57,232	64,029	81,247
DTW	D	DL	BOEING 737-800	160			358		97	-	-	57,278	-	15,519
DTW	D	DL	BOEING 737-900	180						-	-	-	-	-
DTW	D	DL	BOEING 737-900ER	180				356	365	-	-	-	64,080	65,700
DTW	D	DL	AIRBUS INDUSTRIE A321	192						-	-	-	-	-
			Subtotal		0	0	358	356	462	-	-	57,278	64,080	81,219
Fort Lauderdale - Hollywood International Airport								Target Seat Departures (a)		-	-	65,101	72,833	92,418
FLL	D	NK	AIRBUS INDUSTRIE A320neo	182					365	-	-	-	-	66,430
FLL	D	NK	AIRBUS INDUSTRIE A321	228						-	-	-	-	-
FLL	D	NK	AIRBUS INDUSTRIE A320-100/200	182			358	365		-	-	65,156	66,430	-
FLL	D	AS	BOEING 737-800	163				39	159	-	-	-	6,357	25,917
			Subtotal		0	0	358	404	524	-	-	65,156	72,787	92,347

Table F.11 - Forecast of Scheduled Passenger Aircraft Departures by Market (4 of 14)

Market	Dom/ Int	Airline	Equipment	Seats	Departures 2015	2022	2027	2032	2037	Seat Departures 2015	2022	2027	2032	2037
Fresno Yosemite International Airport								Target Seat Departures (a)		170	-	6,703	7,499	9,516
FAT	D	UA	CANADAIR RJ-200ER /RJ-440	50	2					100	-	-	-	-
FAT	D	UA	CANADAIR RJ-700	70	1					70	-	-	-	-
FAT	D	AS	DEHAVILLAND DHC8-400 DASH-8	76			88	99	125	-	-	6,688	7,524	9,500
			Subtotal		3	0	88	99	125	170	-	6,688	7,524	9,500
Honolulu International Airport								Target Seat Departures (a)		135,597	162,062	180,631	205,909	256,425
HNL	D	AS	BOEING 737-800	163	157	365				25,591	59,495	-	-	-
HNL	D	AS	BOEING 737-900ER	181	37					6,697	-	-	-	-
HNL	D	AS	BOEING 737-900	181	50					9,050	-	-	-	-
HNL	D	AS	BOEING 737-9 MAX	181			365	365	651	-	-	66,065	66,065	117,831
HNL	D	AS	BOEING 737-8 MAX	163				7		-	-	-	1,141	-
HNL	D	HA	BOEING 767-300/300ER	260	363					94,380	-	-	-	-
HNL	D	HA	AIRBUS A330-200	294							-	-	-	-
HNL	D	HA	AIRBUS INDUSTRIE A321neo	190		540	603	730	730		102,600	114,570	138,700	138,700
			Subtotal		607	905	968	1102	1381	135,718	162,095	180,635	205,906	256,531
Houston - Bush Intercontinental Airport								Target Seat Departures (a)		78,770	59,425	66,234	75,503	94,026
IAH	D	UA	AIRBUS INDUSTRIE A319	128	46					5,888	-	-	-	-
IAH	D	UA	AIRBUS INDUSTRIE A320-100/200	150	153	77				22,950	11,550	-	-	-
IAH	D	UA	AIRBUS INDUSTRIE A319 neo	128			517	590	719	-	-	66,176	75,520	92,032
IAH	D	UA	BOEING 737-9 MAX	179					11	-	-	-	-	1,969
IAH	D	UA	BOEING 737-700/700LR	118	22					2,596	-	-	-	-
IAH	D	UA	BOEING 737-800	166	167	288				27,722	47,808	-	-	-
IAH	D	UA	BOEING 757-200	169	1					169	-	-	-	-
IAH	D	UA	BOEING 737-900	170	123					20,910	-	-	-	-
			Subtotal		512	365	517	590	730	80,235	59,358	66,176	75,520	94,001
Kahului Airport								Target Seat Departures (a)		153,814	183,834	204,898	233,572	290,875
OGG	D	AS	BOEING 737-800	163	368	365				59,984	59,495	-	-	-
OGG	D	AS	BOEING 737-900ER	181	1	174	260			181	31,494	47,060	-	-
OGG	D	AS	BOEING 737-9 MAX	181				365	730	-	-	-	66,065	132,130
OGG	D	AS	BOEING 737-8 MAX	163			365	365		-	-	59,495	59,495	-
OGG	D	HA	AIRBUS A330-200	294					193	-	-	-	-	56,742
OGG	D	HA	AIRBUS INDUSTRIE A321neo	190		489	518	569	537	-	92,910	98,420	108,110	102,030
OGG	D	HA	BOEING 767-300/300ER	260	361					93,860	-	-	-	-
			Subtotal		730	1028	1143	1299	1460	154,025	183,899	204,975	233,670	290,902
Kansas City International Airport								Target Seat Departures (a)		-	51,151	55,458	64,990	78,728
MCI	D	WN	BOEING 737-700/700LR	143		358				-	51,194	-	-	-
MCI	D	WN	BOEING 737-800	175			29	365		-	-	5,075	63,875	-
MCI	D	WN	BOEING 737-7 MAX	150			336	7	525	-	-	50,400	1,050	78,750
MCI	D	WN	BOEING 737-8 MAX	175						-	-	-	-	-
			Subtotal		0	358	365	372	525	-	51,194	55,475	64,925	78,750

Table F.11 - Forecast of Scheduled Passenger Aircraft Departures by Market (5 of 14)

Market	Dom/ Int	Airline	Equipment	Seats	Departures 2015	2022	2027	2032	2037	Seat Departures 2015	2022	2027	2032	2037
Kona International at Keahole								Target Seat Departures (a)		34,969	41,794	46,583	53,102	66,129
KOA	D	AS	BOEING 737-800	163	179	256				29,177	41,728	-	-	-
KOA	D	AS	BOEING 737-900ER	181	16		257	293		2,896	-	46,517	53,033	-
KOA	D	AS	BOEING 737-900	181	16					2,896	-	-	-	-
KOA	D	AS	BOEING 737-9 MAX	181					365	-	-	-	-	66,065
KOA	D	AS	BOEING 737-8 MAX	163						-	-	-	-	-
			Subtotal		211	256	257	293	365	34,969	41,728	46,517	53,033	66,065
Las Vegas - McCarran International Airport								Target Seat Departures (a)		445,770	611,954	682,071	777,523	968,274
LAS	D	AA	MCDONNELL DOUGL DC9 SUPER 80/MD81/2/3/8	140	2					280	-	-	-	-
LAS	D	DL	EMBRAER-175	76	8	1095	730			608	83,220	55,480	-	-
LAS	D	DL	BOMBARDIER CS100	110			365	1095	1460	-	-	40,150	120,450	160,600
LAS	D	AS	BOEING 737-800	163			730	730	1095	-	-	118,990	118,990	178,485
LAS	D	AS	BOEING 737-900ER	181						-	-	-	-	-
LAS	D	WN	BOEING 737-300	141	848					119,568	-	-	-	-
LAS	D	WN	BOEING 737-700/700LR	143	1834	2357	1600	1095		262,262	337,051	228,800	156,585	-
LAS	D	WN	BOEING 737-800	175	360	1095	999	1095	1095	63,000	191,625	174,825	191,625	191,625
LAS	D	WN	BOEING 737-7 MAX	150				365	1095	-	-	-	54,750	164,250
LAS	D	WN	BOEING 737-8 MAX	175			365	772	1562	-	-	63,875	135,100	273,350
			Subtotal		3052	4547	4789	5152	6307	445,718	611,896	682,120	777,500	968,310
Lihue Airport								Target Seat Departures (a)		34,230	40,911	45,598	51,979	64,732
LIH	D	AS	BOEING 737-800	163	210	251	280			34,230	40,913	45,640	-	-
LIH	D	AS	BOEING 737-9 MAX	181				287	357	-	-	-	51,947	64,617
LIH	D	AS	BOEING 737-8 MAX	163						-	-	-	-	-
			Subtotal		210	251	280	287	357	34,230	40,913	45,640	51,947	64,617
Long Beach Airport								Target Seat Departures (a)		-	210,361	234,464	267,276	307,847
LGB	D	B6	AIRBUS INDUSTRIE A320-100/200	162		1298	1447	1460	895	-	210,276	234,414	236,520	144,990
LGB	D	B6	AIRBUS INDUSTRIE A321	190				0	565	-	-	-	-	107,350
LGB	D	AS	EMBRAER-175	76				404	730	-	-	-	30,704	55,480
			Subtotal		0	1298	1447	1864	2190	-	210,276	234,414	267,224	307,820

Table F.11 - Forecast of Scheduled Passenger Aircraft Departures by Market (6 of 14)

Market	Dom/ Int	Airline	Equipment	Seats	Departures 2015	2022	2027	2032	2037	Seat Departures 2015	2022	2027	2032	2037
Los Angeles Airport					7958			Target Seat Departures (a)		821,836	944,813	1,053,069	1,200,439	1,494,944
LAX	D	AS	BOEING 737-400	144	1					144	-	-	-	-
LAX	D	AS	BOEING 737-800	163						-	-	-	-	-
LAX	D	AS	BOEING 737-9 MAX	181						-	-	-	-	-
LAX	D	AS	BOEING 737-8 MAX	163				365	1460	-	-	-	59,495	237,980
LAX	D	AS	EMBRAER-175	76			1095	730		-	-	83,220	55,480	-
LAX	D	AA	MCDONNELL DOUGL DC9 SUPER 80/MD81/2/3/8	140	1					140	-	-	-	-
LAX	D	AA	CANADAIR RJ-900	77	416					32,032	-	-	-	-
LAX	D	AA	EMBRAER-175	76		1800	1825	1095		-	136,800	138,700	83,220	-
LAX	D	AA	BOEING 737-800	160				730	1825	-	-	-	116,800	292,000
LAX	D	DL	EMBRAER 170	69	17					1,173	-	-	-	-
LAX	D	DL	EMBRAER-175	76	883	1460	1095	800		67,108	110,960	83,220	60,800	-
LAX	D	DL	AIRBUS INDUSTRIE A319	126	3					378	-	-	-	-
LAX	D	DL	BOEING 717-200	110	441	1432	1460			48,510	157,520	160,600	-	-
LAX	D	DL	BOMBARDIER CS100	110			339	2200	2800	-	-	37,290	242,000	308,000
LAX	D	DL	CANADAIR RJ-200ER /RJ-440	50	1087					54,350	-	-	-	-
LAX	D	DL	CANADAIR RJ-700	65	427					27,755	-	-	-	-
LAX	D	DL	CANADAIR RJ-900	76	1182					89,832	-	-	-	-
LAX	D	WN	BOEING 737-300	141	1255					176,955	-	-	-	-
LAX	D	WN	BOEING 737-700/700LR	143	2182	3100	2500	1600	500	312,026	443,300	357,500	228,800	71,500
LAX	D	WN	BOEING 737-800	175	63	550	550	500	500	11,025	96,250	96,250	87,500	87,500
LAX	D	WN	BOEING 737-7 MAX	150				725	1600	-	-	-	108,750	240,000
LAX	D	WN	BOEING 737-8 MAX	175			550	900	1474	-	-	96,250	157,500	257,950
			Subtotal		7958	8342	9414	9645	10159	821,428	944,830	1,053,030	1,200,345	1,494,930
Mahlon Sweet Field								Target Seat Departures (a)		4,332	29,316	32,675	37,248	46,386
EUG	D	AS	DEHAVILLAND DHC8-400 DASH-8	76	57	386	365	365		4,332	29,336	27,740	27,740	-
EUG	D	AS	EMBRAER-175	76			65	125	610	-	-	4,940	9,500	46,360
			Subtotal		57	386	430	490	610	4,332	29,336	32,680	37,240	46,360
Miami International Airport								Target Seat Departures (a)		-	-	-	-	57,232
MIA	D	AA	BOEING 737-8 MAX	160					358	-	-	-	-	57,280
MIA	D	AA	AIRBUS INDUSTRIE A321	187						-	-	-	-	-
MIA	D	AA	AIRBUS INDUSTRIE A321neo	187						-	-	-	-	-
			Subtotal		0	0	0	0	358	0	0	0	0	57280
Minneapolis-St Paul International Airport								Target Seat Departures (a)		82,971	99,165	110,527	125,994	156,905
MSP	D	AA	BOEING 737-800	150	1					150	-	-	-	-
MSP	D	DL	BOEING 737-800	160	1		691	730		160	-	110,560	116,800	-
MSP	D	DL	BOEING 757-200	181	39					7,059	-	-	-	-
MSP	D	DL	BOEING 737-900ER	180				51	872	-	-	-	9,180	156,960
MSP	D	DL	BOEING 737-900	180	5					900	-	-	-	-
MSP	D	DL	MCDONNELL DOUGLAS MD-90	160	467	620				74,720	99,200	-	-	-
			Subtotal		513	620	691	781	872	82,989	99,200	110,560	125,980	156,960

Table F.11 - Forecast of Scheduled Passenger Aircraft Departures by Market (7 of 14)

Market	Dom/ Int	Airline	Equipment	Seats	Departures 2015	2022	2027	2032	2037	Seat Departures 2015	2022	2027	2032	2037
New York - John F Kennedy International Airport									Target Seat Departures (a)	47,700	57,010	63,542	72,434	90,205
JFK	D	B6	AIRBUS INDUSTRIE A320-100/200	150	318					47,700	-	-	-	-
JFK	D	B6	AIRBUS INDUSTRIE A320-100/200	162		352				-	57,024	-	-	-
JFK	D	B6	AIRBUS INDUSTRIE A321	190						-	-	-	-	-
JFK	D	B6	AIRBUS INDUSTRIE A320neo	162			210	19	129	-	-	34,020	3,078	20,898
JFK	D	B6	AIRBUS INDUSTRIE A321neo	190			155	365	365	-	-	29,450	69,350	69,350
			Subtotal		318	352	365	384	494	47,700	57,024	63,470	72,428	90,248
Newark International Airport									Target Seat Departures (a)	-	118,990	129,009	151,184	183,142
EWR	D	UA	BOEING 737-800	166	0	361	185			-	59,926	30,710	-	-
EWR	D	UA	BOEING 737-9 MAX	179	0		180	365	365	-	-	32,220	65,335	65,335
EWR	D	AS	BOEING 737-800	163		362				-	59,006	-	-	-
EWR	D	AS	BOEING 737-9 MAX	181			365	365	365	-	-	66,065	66,065	66,065
EWR	D	AS	BOEING 737-8 MAX	163	0			121	317	-	-	-	19,723	51,671
			Subtotal		0	723	730	851	1047	-	118,932	128,995	151,123	183,071
Ontario International Airport									Target Seat Departures (a)	201,929	241,340	268,993	306,636	406,864
ONT	D	DL	BOEING 717-200	110	1					110	-	-	-	-
ONT	D	DL	CANADAIR RJ-200ER /RJ-440	50	1					50	-	-	-	-
ONT	D	AS	EMBRAER-175	76		730	730	730	1460	-	55,480	55,480	55,480	110,960
ONT	D	WN	BOEING 737-300	141	529					74,589	-	-	-	-
ONT	D	WN	BOEING 737-500	122	1					122	-	-	-	-
ONT	D	WN	BOEING 737-700/700LR	143	878	1299	1460	1095	500	125,554	185,757	208,780	156,585	71,500
ONT	D	WN	BOEING 737-800	175	8		27	541	425	1,400	-	4,725	94,675	74,375
ONT	D	WN	BOEING 737-7 MAX	150					800	-	-	-	-	120,000
ONT	D	WN	BOEING 737-8 MAX	175					172	-	-	-	-	30,100
			Subtotal		1418	2029	2217	2366	3357	201,825	241,237	268,985	306,740	406,935
Orlando International Airport									Target Seat Departures (a)	-	65,101	70,583	82,715	100,200
MCO	D	NK	AIRBUS INDUSTRIE A320neo	182						-	-	-	-	-
MCO	D	NK	AIRBUS INDUSTRIE A321	228			108	363	365	-	-	24,624	82,764	83,220
MCO	D	NK	AIRBUS INDUSTRIE A320-100/200	182		358	252			-	65,156	45,864	-	-
MCO	D	AS	BOEING 737-9 MAX	181					94	-	-	-	-	17,014
			Subtotal		0	358	360	363	459	-	65,156	70,488	82,764	100,234
Palm Springs International									Target Seat Departures (a)	-	6,703	7,268	8,517	10,317
PSP	D	AS	EMBRAER-175	76		88	95	80	60	-	6,688	7,220	6,080	4,560
PSP	D	AS	BOEING 737-800	163				15	35	-	-	-	2,445	5,705
PSP	D	AS	BOEING 737-9 MAX	181						-	-	-	-	-
			Subtotal		0	88	95	95	95	-	6,688	7,220	8,525	10,265
Philadelphia International Airport									Target Seat Departures (a)	-	44,713	48,477	56,810	68,819
PHL	D	AA	BOEING 737-800	160	0					-	-	-	-	-
PHL	D	AA	BOEING 737-8 MAX	160			105	337	4	-	-	16,800	53,920	640
PHL	D	AA	AIRBUS INDUSTRIE A319	124		360	255	23		-	44,640	31,620	2,852	-
PHL	D	AA	AIRBUS INDUSTRIE A321neo	187					365	-	-	-	-	68,255
			Subtotal		0	360	360	360	369	-	44,640	48,420	56,772	68,895

Table F.11 - Forecast of Scheduled Passenger Aircraft Departures by Market (8 of 14)

Market	Dom/ Int	Airline	Equipment	Seats	Departures 2015	2022	2027	2032	2037	Seat Departures 2015	2022	2027	2032	2037
Phoenix Sky Harbor International Airport									Target Seat Departures (a)	490,580	586,328	653,509	744,963	927,726
PHX	D	AA	AIRBUS INDUSTRIE A319	124	377					46,748	-	-	-	-
PHX	D	AA	AIRBUS INDUSTRIE A320-100/200	150	415					62,250	-	-	-	-
PHX	D	AA	AIRBUS INDUSTRIE A321	187	50	225	206	62		9,350	42,075	38,522	11,594	-
PHX	D	AA	MCDONNELL DOUGL DC9 SUPER 80/MD81/2/3/8	140	1					140	-	-	-	-
PHX	D	AA	AIRBUS INDUSTRIE A319	124	351	365	365			43,524	45,260	45,260	-	-
PHX	D	AA	AIRBUS INDUSTRIE A320-100/200	150	425	730	365			63,750	109,500	54,750	-	-
PHX	D	AA	AIRBUS INDUSTRIE A321	187	7					1,309	-	-	-	-
PHX	D	AA	BOEING 757-200	190	1					190	-	-	-	-
PHX	D	AA	BOEING 737-800	160		730	1095	1095	1095	-	116,800	175,200	175,200	175,200
PHX	D	AA	BOEING 737-8 MAX	160				365	730	-	-	-	58,400	116,800
PHX	D	AA	AIRBUS INDUSTRIE A321neo	187				365	365	-	-	-	68,255	68,255
PHX	D	AA	CANADAIR RJ-200ER /RJ-440	50	3					150	-	-	-	-
PHX	D	AA	CANADAIR RJ-900	78	128					9,984	-	-	-	-
PHX	D	AS	EMBRAER-175	76			730	1095	730	-	-	55,480	83,220	55,480
PHX	D	AS	BOEING 737-800	163					730	-	-	-	-	118,990
PHX	D	DL	CANADAIR RJ-200ER /RJ-440	50	6					300	-	-	-	-
PHX	D	DL	CANADAIR RJ-700	65	1					65	-	-	-	-
PHX	D	WN	BOEING 737-300	141	547					77,127	-	-	-	-
PHX	D	WN	BOEING 737-700/700LR	143	1113	1460	1095	1095	730	159,159	208,780	156,585	156,585	104,390
PHX	D	WN	BOEING 737-800	175	95	365	730	730	730	16,625	63,875	127,750	127,750	127,750
PHX	D	WN	BOEING 737-7 MAX	150					647	-	-	-	-	97,050
PHX	D	WN	BOEING 737-8 MAX	175				365	365	-	-	-	63,875	63,875
			Subtotal		3520	3875	4586	5172	6122	490,671	586,290	653,547	744,879	927,790
Portland International Airport									Target Seat Departures (a)	385,887	461,202	514,046	585,983	729,743
PDX	D	AS	BOEING 737-400	144	525					75,600	-	-	-	-
PDX	D	AS	BOEING 737-700/700LR	124	262	365	365			32,488	45,260	45,260	-	-
PDX	D	AS	BOEING 737-800	163	295	730	730	365	365	48,085	118,990	118,990	59,495	59,495
PDX	D	AS	BOEING 737-900ER	181	22	269	365	365		3,982	48,689	66,065	66,065	-
PDX	D	AS	BOEING 737-900	181	51					9,231	-	-	-	-
PDX	D	AS	BOEING 737-9 MAX	181					365	-	-	-	-	66,065
PDX	D	AS	BOEING 737-8 MAX	163				730	1095	-	-	-	118,990	178,485
PDX	D	AS	EMBRAER-175	76		365	365	730	730	-	27,740	27,740	55,480	55,480
PDX	D	AS	DEHAVILLAND DHC8-400 DASH-8	76	347					26,372	-	-	-	-
PDX	D	DL	CANADAIR RJ-900	76	1					76	-	-	-	-
PDX	D	WN	BOEING 737-300	140	335					46,900	-	-	-	-
PDX	D	WN	BOEING 737-700/700LR	143	977	1095	1095	730	365	139,711	156,585	156,585	104,390	52,195
PDX	D	WN	BOEING 737-800	175	19	365	365	730	730	3,325	63,875	63,875	127,750	127,750
PDX	D	WN	BOEING 737-7 MAX	150			237	359	843	-	-	35,550	53,850	126,450
PDX	D	WN	BOEING 737-8 MAX	175					365	-	-	-	-	63,875
			Subtotal		2834	3189	3522	4009	4858	385,770	461,139	514,065	586,020	729,795
Reno/Tahoe International Airport									Target Seat Departures (a)	51,947	62,086	69,199	78,883	98,236
RNO	D	AS	DEHAVILLAND DHC8-400 DASH-8	76	682	816	730			51,832	62,016	55,480	-	-
RNO	D	AS	EMBRAER-175	76			180	1037	1292	-	-	13,680	78,812	98,192
RNO	D	DL	CANADAIR RJ-200ER /RJ-440	50	1					50	-	-	-	-
RNO	D	DL	CANADAIR RJ-700	65	1					65	-	-	-	-
			Subtotal		684	816	910	1037	1292	51,947	62,016	69,160	78,812	98,192

Table F.11 - Forecast of Scheduled Passenger Aircraft Departures by Market (9 of 14)

Market	Dom/ Int	Airline	Equipment	Seats	Departures 2015	2022	2027	2032	2037	Seat Departures 2015	2022	2027	2032	2037
Salt Lake City International Airport								Target Seat Departures (a)		168,795	294,246	327,960	373,856	465,575
SLC	D	AS	BOEING 737-400	144	42					6,048	-	-	-	-
SLC	D	AS	BOEING 737-700/700LR	124	6					744	-	-	-	-
SLC	D	AS	BOEING 737-800	163	17					2,771	-	-	-	-
SLC	D	AS	DEHAVILLAND DHC8-400 DASH-8	76	205					15,580	-	-	-	-
SLC	D	AS	EMBRAER-175	76		364	730	730	1095	-	27,664	55,480	55,480	83,220
SLC	D	AS	BOEING 737-9 MAX	181						-	-	-	-	-
SLC	D	AS	BOEING 737-8 MAX	163						-	-	-	-	-
SLC	D	B6	AIRBUS INDUSTRIE A320-100/200	150	1					150	-	-	-	-
SLC	D	DL	EMBRAER-175	76	18			510	730	1,368	-	-	38,760	55,480
SLC	D	DL	AIRBUS INDUSTRIE A319	126	12	620	311			1,512	78,120	39,186	-	-
SLC	D	DL	AIRBUS INDUSTRIE A320-100/200	150	219	245				32,850	36,750	-	-	-
SLC	D	DL	BOEING 717-200	110	2					220	-	-	-	-
SLC	D	DL	BOEING 737-800	160	6					960	-	-	-	-
SLC	D	DL	BOEING 757-200	182	48					8,736	-	-	-	-
SLC	D	DL	BOMBARDIER CS100	110			730	1095	1095	-	-	80,300	120,450	120,450
SLC	D	DL	CANADAIR RJ-200ER /RJ-440	50	341					17,050	-	-	-	-
SLC	D	DL	CANADAIR RJ-700	66	483					31,878	-	-	-	-
SLC	D	DL	CANADAIR RJ-900	76	640	640	640			48,640	48,640	48,640	-	-
SLC	D	WN	BOEING 737-700/700LR	143	1	721	730	730	365	143	103,103	104,390	104,390	52,195
SLC	D	WN	BOEING 737-800	175					365	-	-	-	-	63,875
SLC	D	WN	BOEING 737-7 MAX	150				365	365	-	-	-	54,750	54,750
SLC	D	WN	BOEING 737-8 MAX	175					204	-	-	-	-	35,700
SLC	D	UA	AIRBUS INDUSTRIE A319	128	1					128	-	-	-	-
			Subtotal		2042	2590	3141	3430	4219	168,778	294,277	327,996	373,830	465,670
San Antonio International Airport					5			Target Seat Departures (a)		694	-	51,151	57,226	72,614
SAT	D	AA	MCDONNELL DOUGL DC9 SUPER 80/MD81/2/3/8	140	2					280	-	-	-	-
SAT	D	WN	BOEING 737-700/700LR	143	2					286	-	-	-	-
SAT	D	WN	BOEING 737-800	175						-	-	-	-	-
SAT	D	WN	BOEING 737-7 MAX	150			341	232	484	-	-	51,150	34,800	72,600
SAT	D	WN	BOEING 737-8 MAX	175				128		-	-	-	22,400	-
SAT	D	UA	AIRBUS INDUSTRIE A319	128	1					128	-	-	-	-
			Subtotal		5	0	341	360	484	694	-	51,150	57,200	72,600
San Diego International Airport								Target Seat Departures (a)		467,625	581,299	647,903	738,573	919,768
SAN	D	WN	BOEING 737-300	141	667					94,047	-	-	-	-
SAN	D	WN	BOEING 737-700/700LR	143	2487	2800	2800	2000	1200	355,641	400,400	400,400	286,000	171,600
SAN	D	WN	BOEING 737-800	175	103	193	234	600	600	18,025	33,775	40,950	105,000	105,000
SAN	D	WN	BOEING 737-7 MAX	150				600	800	-	-	-	90,000	120,000
SAN	D	WN	BOEING 737-8 MAX	175		365	365	437	1479	-	63,875	63,875	76,475	258,825
SAN	D	AS	EMBRAER-175	76		1095	1095	730		-	83,220	83,220	55,480	-
SAN	D	AS	BOEING 737-800	163			365	365		-	-	59,495	59,495	-
SAN	D	AS	BOEING 737-900ER	181					730	-	-	-	-	132,130
SAN	D	AS	BOEING 737-9 MAX	181				365	730	-	-	-	66,065	132,130
SAN	D	AS	BOEING 737-8 MAX	163						-	-	-	-	-
			Subtotal		3257	4453	4859	5097	5539	467,713	581,270	647,940	738,515	919,685

Table F.11 - Forecast of Scheduled Passenger Aircraft Departures by Market (10 of 14)

Market	Dom/ Int	Airline	Equipment	Seats	Departures 2015	Departures 2022	Departures 2027	Departures 2032	Departures 2037	Seat Departures 2015	Seat Departures 2022	Seat Departures 2027	Seat Departures 2032	Seat Departures 2037
Santa Ana - John Wayne Airport								Target Seat Departures (a)		423,120	531,163	592,023	674,872	840,440
SNA	D	WN	BOEING 737-700/700LR	143	2790	2790	2790	2200	1400	398,970	398,970	398,970	314,600	200,200
SNA	D	WN	BOEING 737-800	175	138	280	469	565	600	24,150	49,000	82,075	98,875	105,000
SNA	D	WN	BOEING 737-7 MAX	150				365	730	-	-	-	54,750	109,500
SNA	D	WN	BOEING 737-8 MAX	175				365	1096	-	-	-	63,875	191,800
SNA	D	AS	EMBRAER-175	76		1095	1460	1095	730	-	83,220	110,960	83,220	55,480
SNA	D	AS	BOEING 737-800	163						-	-	-	-	-
SNA	D	AS	BOEING 737-9 MAX	181						-	-	-	-	-
SNA	D	AS	BOEING 737-8 MAX	163				365	1095	-	-	-	59,495	178,485
			Subtotal		2928	4165	4719	4955	5651	423,120	531,190	592,005	674,815	840,465
Seattle/Tacoma International Airport								Target Seat Departures (a)		598,413	715,207	797,155	908,712	1,131,647
SEA	D	AS	BOEING 737-400	144	763					109,872	-	-	-	-
SEA	D	AS	BOEING 737-700/700LR	124	290					35,960	-	-	-	-
SEA	D	AS	BOEING 737-800	163	709	730	365	365		115,567	118,990	59,495	59,495	-
SEA	D	AS	BOEING 737-900ER	181	262	729	730	365	365	47,422	131,949	132,130	66,065	66,065
SEA	D	AS	BOEING 737-900	181	257					46,517	-	-	-	-
SEA	D	AS	BOEING 737-9 MAX	181		365	730	1095	1531	-	66,065	132,130	198,195	277,111
SEA	D	AS	BOEING 737-8 MAX	163		730	730	1095	1460	-	118,990	118,990	178,485	237,980
SEA	D	AS	DEHAVILLAND DHC8-400 DASH-8	76	1					76	-	-	-	-
SEA	D	DL	EMBRAER 170	69	3					207	-	-	-	-
SEA	D	DL	EMBRAER-175	76	275	1460				20,900	110,960	-	-	-
SEA	D	DL	CANADAIR RJ-200ER /RJ-440	50	2					100	-	-	-	-
SEA	D	DL	CANADAIR RJ-700	65	808					52,520	-	-	-	-
SEA	D	DL	CANADAIR RJ-900	76	384					29,184	-	-	-	-
SEA	D	DL	BOMBARDIER CS100	110			1460	1668	1095	-	-	160,600	183,480	120,450
SEA	D	DL	BOEING 737-900ER	180					730	-	-	-	-	131,400
SEA	D	WN	BOEING 737-300	142	189					26,838	-	-	-	-
SEA	D	WN	BOEING 737-700/700LR	143	553	730	730	730	365	79,079	104,390	104,390	104,390	52,195
SEA	D	WN	BOEING 737-800	175	194	365	365	365	365	33,950	63,875	63,875	63,875	63,875
SEA	D	WN	BOEING 737-7 MAX	150			170	365	365	-	-	25,500	54,750	54,750
SEA	D	WN	BOEING 737-8 MAX	175					730	-	-	-	-	127,750
SEA	D	SY	BOEING 737-800	162	1					162	-	-	-	-
			Subtotal		4691	5109	5280	6048	7006	598,354	715,219	797,110	908,735	1,131,576
Tampa International Airport								Target Seat Departures (a)		-	-	-	65,101	80,511
TPA	D	NK	AIRBUS INDUSTRIE A320neo	182	0			358	25	-	-	-	65,156	4,550
TPA	D	NK	AIRBUS INDUSTRIE A321	228					333	-	-	-	-	75,924
TPA	D	NK	AIRBUS INDUSTRIE A320-100/200	182						-	-	-	-	-
			Subtotal		0	0	0	358	358	-	-	-	65,156	80,474

Table F.11 - Forecast of Scheduled Passenger Aircraft Departures by Market (11 of 14)

Market	Dom/ Int	Airline	Equipment	Seats	Departures 2015	2022	2027	2032	2037	Seat Departures 2015	2022	2027	2032	2037
Other Miscelleneous Domestic														
									Target Seat Departures (a)	23,219	27,751	30,930	35,259	43,909
MISC	D	AA	BOEING 737-800	154	1	1	2	2	3	154	154	308	308	462
MISC	D	AA	CANADAIR RJ-900	79	1	1	2	3	3	79	79	158	237	237
MISC	D	AA	MCDONNELL DOUGL DC9 SUPER 80/MD81/2/3/8	140	4	0	0	0	0	560	-	-	-	-
MISC	D	B6	AIRBUS INDUSTRIE A320-100/200	146	1	1	1	1	0	146	146	146	146	-
MISC	D	AS	BOEING 737-800	163	1	1	1	2	3	163	163	163	326	489
MISC	D	AS	DEHAVILLAND DHC8-400 DASH-8	76	1	1	1	1	0	76	76	76	76	-
MISC	D	B6	AIRBUS INDUSTRIE A320-100/200	150	1	1	1	1	1	150	150	150	150	150
MISC	D	Charter A	EMBRAER-135	35	1	0	0	0	0	35	-	-	-	-
MISC	D	DL	CANADAIR RJ-200ER /RJ-440	50	11	5	0	0	0	550	250	-	-	-
MISC	D	DL	CANADAIR RJ-700	66	1	1	1	1	0	66	66	66	66	-
MISC	D	DL	CANADAIR RJ-900	76	9	10	12	12	12	684	760	912	912	912
MISC	D	DL	EMBRAER EMB-120 BRASILIA	30	2	0	0	0	0	60	-	-	-	-
MISC	D	DL	EMBRAER-175	76	1	2	4	6	11	76	152	304	456	836
MISC	D	DL	MCDONNELL DOUGLAS MD-90	160	1	1	0	0	0	160	160	-	-	-
MISC	D	HA	BOEING 767-300/300ER	260	2	2	2	2	2	520	520	520	520	520
MISC	D	SY	BOEING 737-800	162	3	4	5	6	7	486	648	810	972	1,134
MISC	D	UA	AIRBUS INDUSTRIE A319	128	1	1	1	1	1	128	128	128	128	128
MISC	D	UA	AIRBUS INDUSTRIE A320-100/200	150	2	2	2	2	2	300	300	300	300	300
MISC	D	UA	BOEING 737-800	154	1	1	1	2	2	154	154	154	308	308
MISC	D	WN	BOEING 737-300	143	1	0	0	0	0	143	-	-	-	-
MISC	D	WN	BOEING 737-700/700LR	143	9	10	11	12	14	1,287	1,430	1,573	1,716	2,002
MISC	D	WN	BOEING 737-800	175	2	3	4	5	8	350	525	700	875	1,400
MISC	D	OTH	AIRBUS INDUSTRIE A319	59	17	21	24	30	34	996	1,230	1,406	1,758	1,992
MISC	D	OTH	BOEING 737-400	112	22	15	5	-	-	2,468	1,683	561	-	-
MISC	D	OTH	BOEING 737-500	66	9	7	5	-	-	598	465	332	-	-
MISC	D	OTH	BOEING 737-700/700LR	145	3	6	10	15	20	434	868	1,447	2,170	2,893
MISC	D	OTH	BOEING 737-800	164	10	30	36	42	56	1,640	4,920	5,904	6,888	9,184
MISC	D	OTH	BOEING 747-400	439	3	3	3	3	3	1,316	1,316	1,316	1,316	1,316
MISC	D	OTH	BOEING 757-200	193	6	6	6	4	2	1,155	1,155	1,155	770	385
MISC	D	OTH	BOEING 757-300	218	4	4	4	4	2	873	873	873	873	437
MISC	D	OTH	BOEING 767-200/200ER	102	1	1	1	-	-	102	102	102	-	-
MISC	D	OTH	BOEING 767-300/300ER	206	7	11	15	23	30	1,439	2,261	3,084	4,728	6,167
MISC	D	OTH	BOEING 767-400	242	9	11	13	15	20	2,178	2,662	3,146	3,630	4,840
MISC	D	OTH	BOEING 777-200/200LR	247	1	2	4	6	10	247	494	988	1,482	2,470
MISC	D	OTH	BOEING 737-900	176	3	5	6	8	13	527	878	1,054	1,405	2,284
MISC	D	OTH	BOMBARDIER GLOBAL 6000	14	3	4	5	5	5	42	56	70	70	70
MISC	D	OTH	BOMBARDIER LEARJET 75	9	1	1	1	1	1	9	9	9	9	9
MISC	D	OTH	CESSNA 510 MUSTANG/560XL CITATION XL	8	1	1	1	1	1	8	8	8	8	8
MISC	D	OTH	DASSAULT-FALCON 2000EX	8	13	17	20	22	24	104	136	160	176	192
MISC	D	OTH	EMBRAER 190	104	6	10	13	15	17	621	1,035	1,346	1,553	1,760
MISC	D	OTH	GULFSTREAM G150	8	12	-	-	-	-	94	-	-	-	-
MISC	D	OTH	GULFSTREAM G200	9	6	-	-	-	-	54	-	-	-	-
MISC	D	OTH	GULFSTREAM G450	13	6	6	6	6	6	78	78	78	78	78
MISC	D	OTH	GULFSTREAM G650	12	3	10	15	19	22	35	117	175	222	257
MISC	D	OTH	GULFSTREAM G-IV	13	24	24	24	24	24	312	312	312	312	312
MISC	D	OTH	GULFSTREAM V/ G-V EXEC/ G-5/ 550	16	4	8	12	17	20	65	130	195	276	325
MISC	D	OTH	LEARJET45	9	1	-	-	-	-	9	-	-	-	-
MISC	D	OTH	MCDONNELL DOUGL DC9 SUPER 80/MD81/2/3/8	165	8	6	4	-	-	1,316	987	658	-	-
MISC	D	OTH	RAYTHEON BEECHCRAFT HAWKER 800XP	8	22	16	10	-	-	176	128	80	-	-
			Subtotal		262	273	294	319	379	23,223	27,764	30,926	35,220	43,856

Table F.11 - Forecast of Scheduled Passenger Aircraft Departures by Market (12 of 14)

Market	Dom/ Int	Airline	Equipment	Seats	Departures 2015	2022	2027	2032	2037	Seat Departures 2015	2022	2027	2032	2037
					International									
Beijing - Capital International Airport								Target Seat Departures (b)		22,354	59,122	64,794	72,862	79,772
PEK	I	HU	BOEING 787-800 DREAMLINER	213	105	278	304	342	338	22,365	59,214	64,752	72,846	71,994
PEK	I	HU	B787-900 DREAMLINER	288					27	-	-	-	-	7,776
			Subtotal		105	278	304	342	365	22,365	59,214	64,752	72,846	79,770
Cancun International Airport					0			Target Seat Departures (b)		-	-	-	-	32,400
CUN	I	AS	BOEING 737-9 MAX	181					179	-	-	-	-	32,399
CUN	I	AS	BOEING 737-8 MAX	163						-	-	-	-	-
CUN	I													
			Subtotal		0	0	0	0	179	0	0	0	0	32399
Guadalajara-Don Miguel Hidalgo Airport								Target Seat Departures (b)		118,503	177,991	195,066	219,355	240,157
GDL	I	AS	BOEING 737-400	144	1					144	-	-	-	-
GDL	I	AS	BOEING 737-800	163	308					50,204	-	-	-	-
GDL	I	AS	BOEING 737-900ER	181	2	365	365			362	66,065	66,065	-	-
GDL	I	AS	BOEING 737-900	181	2					362	-	-	-	-
GDL	I	AS	BOEING 737-9 MAX	181				462	577	-	-	-	83,622	104,437
GDL	I	AS	BOEING 737-8 MAX	163						-	-	-	-	-
GDL	I	Y4	AIRBUS INDUSTRIE A319	144	1					144	-	-	-	-
GDL	I	Y4	AIRBUS INDUSTRIE A320-100/200	178	379	365	365			67,462	64,970	64,970	-	-
GDL	I	Y4	AIRBUS INDUSTRIE A321	220								-	-	-
GDL	I	Y4	AIRBUS INDUSTRIE A320neo	186		252	344	730	730	-	46,872	63,984	135,780	135,780
			Subtotal		693	982	1074	1192	1307	118,678	177,907	195,019	219,402	240,217
London - Heathrow Airport								Target Seat Departures (b)		-	83,087	91,057	102,395	112,106
LHR	I	BA	B787-900 DREAMLINER	216		240	6			-	51,840	1,296	-	-
LHR	I	BA	BOEING 787-800 DREAMLINER	214						-	-	-	-	-
LHR	I	BA	BOEING 787-1000 DREAMLINER	250		125	359	128	0	-	31,250	89,750	32,000	-
LHR	I	BA	BOEING 777-300ER	297				237	377	-	-	-	70,389	111,969
			Subtotal		0	365	365	365	377	-	83,090	91,046	102,389	111,969
San Jos del Cabo Airport								Target Seat Departures (b)		49,261	73,990	81,088	91,184	99,832
SJD	I	AS	BOEING 737-400	144	180					25,920	-	-	-	-
SJD	I	AS	BOEING 737-700/700LR	124	59					7,316	-	-	-	-
SJD	I	AS	BOEING 737-800	163	65	365				10,595	59,495	-	-	-
SJD	I	AS	BOEING 737-900ER	181	16	80	448			2,896	14,480	81,088	-	-
SJD	I	AS	BOEING 737-900	181	14					2,534	-	-	-	-
SJD	I	AS	BOEING 737-9 MAX	181						-	-	-	-	-
SJD	I	AS	BOEING 737-8 MAX	163				559	612	-	-	-	91,117	99,756
			Subtotal		334	445	448	559	612	49,261	73,975	81,088	91,117	99,756

Table F.11 - Forecast of Scheduled Passenger Aircraft Departures by Market (13 of 14)

Market	Dom/ Int	Airline	Equipment	Seats	Departures 2015	2022	2027	2032	2037	Seat Departures 2015	2022	2027	2032	2037
Tokyo - Narita International Airport								Target Seat Departures (b)		62,206	93,433	102,396	115,146	126,066
NRT	I	NH	B787-900 DREAMLINER	215	15				58	3,225	-	-	-	12,470
NRT	I	NH	BOEING 787-800 DREAMLINER	169	350		606	681	672	59,150	-	102,414	115,089	113,568
NRT	I	NH	BOEING 787-1000 DREAMLINER	250		210				-	52,500	-	-	-
NRT	I	NH	BOEING 777-300ER	264		155				-	40,920	-	-	-
			Subtotal		365	365	606	681	730	62,375	93,420	102,414	115,089	126,038
Vancouver International Airport								Target Seat Departures (b)		-	57,488	63,002	70,847	77,566
YVR	I	AC	CANADAIR RJ-705	75						-	-	-	-	-
YVR	I	AC	CANADAIR RJ-900	76		646	417	90		-	49,096	31,692	6,840	-
YVR	I	AC	BOMBARDIER CS100	100		84	313	640	654	-	8,400	31,300	64,000	65,400
YVR	I	AC	BOEING 737-9 MAX	180						-	-	-	-	-
YVR	I	AC	BOEING 737-8 MAX	160					76	-	-	-	-	12,160
			Subtotal		0	730	730	730	730	-	57,496	62,992	70,840	77,560
Shanghai - Pudong International								Target Seat Departures (b)		-	39,505	43,294	48,685	53,302
PVG	I	CA	AIRBUS A330-200	237		167	183	205	225	-	39,579	43,371	48,585	53,325
PVG	I	CA	B787-900 DREAMLINER	293						-	-	-	-	-
										-	-	-	-	-
			Subtotal		0	167	183	205	225	0	39579	43371	48585	53325
Frankfurt am Main International								Target Seat Departures (b)		-	66,780	73,186	82,299	90,104
FRA	I	LH	AIRBUS A340-300	251		266				-	66,766	-	-	-
FRA	I	LH	AIRBUS A350-900	293			250	281	311	-	-	73,250	82,333	91,123
FRA	I	LH												
			Subtotal		0	266	250	281	311	-	66,766	73,250	82,333	91,123
Pearson International Airport (Toronto)								Target Seat Departures (b)		-	-	-	-	53,802
YYZ	I	AC	BOEING 737-9 MAX	180						-	-	-	-	-
YYZ	I	AC	BOEING 737-8 MAX	160					336	-	-	-	-	53,760
YYZ	I													
			Subtotal		0	0	0	0	336	-	-	-	-	53,760
Hong Kong International Airport								Target Seat Departures (b)		-	43,800	48,002	53,979	59,098
HKG	I	CX	AIRBUS A350-900	280		157	171	193	211	-	43,960	47,880	54,040	59,080
										-	-	-	-	-
			Subtotal		0	157	171	193	211	-	43,960	47,880	54,040	59,080
Seoul International Airport								Target Seat Departures (b)		-	-	79,570	89,478	97,963
ICN	I	KE	AIRBUS A330-200	218			365	227	110	-	-	79,570	49,486	23,980
ICN	I	KE	AIRBUS A350-900	290				138	255	-	-	-	40,020	73,950
			Subtotal		0	0	365	365	365	-	-	79,570	89,506	97,930

Table F.11 - Forecast of Scheduled Passenger Aircraft Departures by Market (14 of 14)

Market	Dom/ Int	Airline	Equipment	Seats	Departures 2015	Departures 2022	Departures 2027	Departures 2032	Departures 2037	Seat Departures 2015	Seat Departures 2022	Seat Departures 2027	Seat Departures 2032	Seat Departures 2037
Other Miscelleneous International								Target Seat Departures (b)		1,281	1,924	2,109	2,371	2,596
MISC	I	Y4	AIRBUS INDUSTRIE A320-100/200	178	1	4	5	7	8	178	712	890	1,246	1,424
MISC	I	OTH	AIRBUS INDUSTRIE A319	74	4	7	7	8	9	294	515	515	588	662
MISC	I	OTH	BOEING 737-400	82	1	1	1	-	-	82	82	82	-	-
MISC	I	OTH	BOEING 737-500	113	3	2	1	-	-	338	225	113	-	-
MISC	I	OTH	BOMBARDIER GLOBAL 6000	14	7	8	9	9	9	98	112	126	126	126
MISC	I	OTH	BOMBARDIER LEARJET 75	9	10	10	10	10	10	90	90	90	90	90
MISC	I	OTH	CANADAIR CHALLENGER 604	12	3	3	3	3	3	36	36	36	36	36
MISC	I	OTH	DASSAULT FALCON 7X	14	2	3	4	5	5	28	42	56	70	70
MISC	I	OTH	DASSAULT-FALCON 2000EX	8	1	3	4	5	5	8	24	32	40	40
MISC	I	OTH	EMBRAER EMB-120 BRASILIA	30	1	-	-	-	-	30	-	-	-	-
MISC	I	OTH	GULFSTREAM G650	9	1	2	2	2	2	9	18	18	18	18
MISC	I	OTH	GULFSTREAM G-IV	14	1	1	1	2	2	14	14	14	28	28
MISC	I	OTH	GULFSTREAM V/ G-V EXEC/ G-5/ 550	16	5	6	6	7	7	80	96	96	112	112
			Subtotal		40	50	53	58	60	1,285	1,966	2,067	2,354	2,606

(a) Table F.7.
(b) Table F.8.

Sources: As noted and HNTB analysis.

Table F.12 – Scheduled Passenger Aircraft Departures by Type

	2015	2022	2027	2032	2037
Domestic					
AIRBUS A330-200	-	-	-	-	193
AIRBUS INDUSTRIE A319	952	2,504	1,571	68	35
AIRBUS INDUSTRIE A319 neo	-	-	517	1,535	1,950
AIRBUS INDUSTRIE A320-100/200	2,065	3,356	2,699	1,979	898
AIRBUS INDUSTRIE A320neo	-	252	491	697	687
AIRBUS INDUSTRIE A321	57	225	679	790	1,628
AIRBUS INDUSTRIE A321neo	-	1,029	1,276	2,394	4,019
BOEING 717-200	444	1,432	1,460	-	-
BOEING 737-300	4,510	-	-	-	-
BOEING 737-400	1,353	15	5	-	-
BOEING 737-500	10	7	5	-	-
BOEING 737-7 MAX	-	765	2,849	5,478	12,983
BOEING 737-700/700LR	17,550	21,551	18,585	14,462	5,459
BOEING 737-8 MAX	-	2,256	5,179	10,920	19,708
BOEING 737-800	4,645	11,346	11,901	11,990	11,760
BOEING 737-9 MAX	-	365	1,640	3,572	7,754
BOEING 737-900	600	5	6	8	13
BOEING 737-900ER	338	1,172	1,669	1,795	3,427
BOEING 747-400	3	3	3	3	3
BOEING 757-200	194	6	6	4	2
BOEING 757-300	22	4	4	4	2
BOEING 767-200/200ER	1	1	1	-	-
BOEING 767-300/300ER	733	13	17	25	32
BOEING 767-400	9	11	13	15	20
BOEING 777-200/200LR	1	2	4	6	10
BOMBARDIER CS100	-	-	2,894	6,058	6,450
CANADAIR RJ-200ER /RJ-440	1,728	105	-	-	-
CANADAIR RJ-700	1,850	1	1	1	-
CANADAIR RJ-900	2,818	651	654	15	15
DEHAVILLAND DHC8-400 DASH-8	1,653	1,568	1,549	830	125
EMBRAER 170	20	-	-	-	-
EMBRAER 190	6	10	13	15	17
EMBRAER-175	1,218	9,883	10,678	10,444	8,859
MCDONNELL DOUGL DC9 SUPER 80/MD81/2/3/8	1,637	6	4	-	-
MCDONNELL DOUGLAS MD80	1	-	-	-	-
MCDONNELL DOUGLAS MD-90	469	621	-	-	-
OTHER	99	87	94	95	103
Subtotal	44,986	59,252	66,467	73,203	86,152
International					
AIRBUS A330-200	-	167	548	432	335
AIRBUS A340-300	-	266	-	-	-
AIRBUS A350-900	-	157	421	612	777
AIRBUS INDUSTRIE A319	5	7	7	8	9
AIRBUS INDUSTRIE A320-100/200	380	369	370	7	8
AIRBUS INDUSTRIE A320neo	-	252	344	730	730
B787-900 DREAMLINER	15	240	6	-	85
BOEING 737-400	182	1	1	-	-
BOEING 737-500	3	2	1	-	-
BOEING 737-700/700LR	59	-	-	-	-
BOEING 737-8 MAX	-	-	-	559	1,024
BOEING 737-800	373	365	-	-	-
BOEING 737-9 MAX	-	-	-	462	756
BOEING 737-900	16	-	-	-	-
BOEING 737-900ER	18	445	813	-	-
BOEING 777-300ER	-	155	-	237	377
BOEING 787-1000 DREAMLINER	-	335	359	128	-
BOEING 787-800 DREAMLINER	455	278	910	1,023	1,010
BOMBARDIER CS100	-	84	313	640	654
CANADAIR RJ-900	-	646	417	90	-
OTHER	31	36	39	43	43
Subtotal	1,537	3,805	4,549	4,971	5,808
Total Departures	46,523	63,057	71,016	78,174	91,960

Sources: Table F.11 and HNTB analysis.

APPENDIX G: SJC AIR CARGO FORECAST

This appendix provides additional detail on the air cargo forecast discussed in Section 7.

Table G.1 provides the FAA forecasts of all-cargo and passenger domestic and international carrier RTMs and domestic and international ASMs that were used in the share analysis.

Table G.2 presents alternative forecasts of U.S. Revenue Ton Miles (RTMs) provided by the FAA, Boeing, and Airbus. The FAA forecast is the most conservative, but all three organizations project domestic air cargo to continue to grow more slowly than GDP. The average of the three forecasts is 1.4 percent per year.

The details of the domestic SJC forecasts of all-cargo, belly cargo, and total air cargo tonnage are provided in **Table G.3**. Total domestic SJC cargo tonnage was projected to grow at the same rate as the consensus forecast from **Table G.2** as adjusted by the ratio of SJC Air Trade Area income to U.S. income. The domestic belly cargo forecast was based on future passenger carrier capacity, for which projected seat departures served as a proxy, adjusted by the projected continued decline in the ratio of U.S. belly cargo RTMs to U.S. ASMs. All-cargo tonnage was calculated as the difference between total tonnage and belly cargo tonnage.

Table G.4 provides alternative forecasts of international RTM growth rates provided by the FAA, Boeing, and Airbus. The three forecasts are very similar and project growth rates ranging from 4.5 to 4.7 percent per year. The average of the three forecasts is 4.6 percent per year.

The forecast of international air cargo tonnage is detailed in **Table G.5**. As noted in Section 7, very little international all-cargo service is projected for SJC. The international belly cargo forecast was based on future international passenger carrier capacity, for which projected international seat departures served as a proxy, adjusted by the projected growth in the ratio of U.S. international belly cargo RTMs to U.S. international ASMs.

Table G.6 provides a summary of the air cargo forecasts.

The all-cargo aircraft operations and fleet mix forecast is presented in **Table G.7**. The fleet mix is based primarily on the announced fleet plans of FedEx and UPS, which call for the retirement of Airbus A-300 and A-310 aircraft and replacement with Boeing 757-200PF and 767-300F aircraft. Longer term, it was assumed that the freighter version of the Airbus A-330 would be introduced at SJC. Consistent with history at SJC, occasional visits by larger aircraft, such as the Boeing 777 and Boeing 747, are projected. The average lift capacity per aircraft operation was estimated from the projected fleet mix and future all-cargo carrier aircraft departures were estimated by dividing total all-cargo carrier lift capacity by the capacity per aircraft.

Table G.1 – FAA Forecasts of Domestic and International Air Cargo Activity

	All-Cargo Carrier RTM's (millions) (a)		Passenger Carrier RTM's (millions) (a)		Total RTM's (millions) (a)		Available Seat Miles (ASMs) (billions) (b)	
Year	Domestic	International	Domestic	International	Domestic	International	Domestic	International
2001	9992	7380	3946	7167	13938	14547	731	247
2008	12261	17516	2147	6905	14408	24421	750	293
2009	10275	13834	1623	5266	11898	19100	682	283
2010	11243	16733	1580	6332	12823	23065	679	281
2011	10601	18980	1446	6250	12047	25230	693	300
2012	10886	18310	1360	5952	12246	24262	694	300
2013	10996	16741	1354	5700	12350	22441	700	303
2014	11226	16356	1451	6148	12677	22504	711	315
2015	11672	16403	1417	6456	13089	22859	744	323
2016	11908	17454	1434	6768	13342	24222	769	325
2017	12172	18651	1455	7125	13627	25776	785	339
2018	12296	19807	1458	7454	13754	27261	805	353
2019	12451	20994	1465	7781	13916	28775	823	368
2020	12653	22234	1477	8116	14130	30350	839	383
2021	12789	23410	1480	8415	14269	31825	854	398
2022	12840	24633	1474	8719	14314	33352	868	412
2023	12881	25956	1467	9045	14348	35001	880	428
2024	12897	27331	1457	9376	14354	36707	893	443
2025	12917	28684	1447	9685	14364	38369	909	458
2026	12944	30107	1438	10005	14382	40112	927	474
2027	12962	31597	1428	10332	14390	41929	945	490
2028	12988	33139	1419	10662	14407	43801	966	507
2029	13003	34717	1409	10989	14412	45706	988	524
2030	13021	36319	1399	11308	14420	47627	1010	541
2031	13026	37974	1387	11628	14413	49602	1033	558
2032	13032	39670	1376	11945	14408	51615	1057	576
2033	13048	41445	1366	12270	14414	53715	1082	594
2034	13062	43292	1355	12599	14417	55891	1106	612
2035	13072	45206	1344	12931	14416	58137	1131	631
2036	13081	47170	1333	13259	14414	60429	1156	650
2037 (c)	13090	49134	1322	13587	14412	62721	1181	669
				Compounded Annual Growth Rate				
2015-2037	0.5%	5.1%	-0.3%	3.4%	0.4%	4.7%	2.1%	3.4%

(a) FAA Aerospace Forecasts: Fiscal Years 2016-2036. Table 19.
(b) FAA Aerospace Forecasts: Fiscal Years 2016-2036. Table 6.
(c) Extrapolated at 2035-2036 growth rate.

Sources: As noted and HNTB analysis.

Table G.2 – Alternative Forecasts of U.S. Domestic Air Cargo (millions of Revenue Ton Miles)

Year	FAA (a)	Boeing (b)	Airbus (c)	Average (d)
2015	13,089	13,089	13,089	13,089
2016	13,342	13,364	13,312	13,339
2017	13,627	13,645	13,538	13,603
2018	13,754	13,931	13,768	13,818
2019	13,916	14,224	14,002	14,047
2020	14,130	14,522	14,240	14,297
2021	14,269	14,827	14,482	14,526
2022	14,314	15,139	14,728	14,727
2023	14,348	15,457	14,979	14,928
2024	14,354	15,781	15,233	15,123
2025	14,364	16,113	15,492	15,323
2026	14,382	16,451	15,740	15,524
2027	14,390	16,796	15,992	15,726
2028	14,407	17,149	16,248	15,935
2029	14,412	17,509	16,508	16,143
2030	14,420	17,877	16,772	16,356
2031	14,413	18,252	17,040	16,569
2032	14,408	18,636	17,313	16,786
2033	14,414	19,027	17,590	17,010
2034	14,417	19,427	17,871	17,238
2035	14,416	19,835	18,157	17,469
2036	14,414	20,251	18,448	17,704
2037	14,412	20,676	18,743	17,944
Compounded Annual Growth Rate				
2015-2037	0.4%	2.1%	1.6%	1.4%

(a) Table G.1.
(b) Boeing, World Air Cargo Forecast: 2014-2015. Growth rate of 2.1 percent per year from base year.
(c) Airbus, Global Market Forecast: 2016-2035. Growth rate of 1.7 percent per year to 2025 and 1.6 percent per year thereafter.
(d) Average of FAA, Boeing, and Airbus forecasts.

Sources: As noted and HNTB analysis.

Table G.3 – Historical and Projected Domestic Air Cargo Tonnage (Short Tons) at SJC

	Belly (a)			All-Cargo Carrier (b)			Total (c)			U.S. Domestic Passenger RTMs	U.S. Domestic Total Air Cargo RTMs	US Domestic ASMs	SJC Domestic Seat	Ratio of US RTMs to ASMs	Income
Year	Enplaned	Deplaned	Total	Enplaned	Deplaned	Total	Enplaned	Deplaned	Total	(millions) (d)	(millions) (e)	(billions) (d)	Departures (f)	(g)	Ratio (h)
2008	2,726	2,477	5,203	38,299	41,221	79,520	41,025	43,698	84,723	2,147	14,408	750		2.86	
2009	1,588	1,909	3,497	31,446	34,136	65,582	33,034	36,045	69,079	1,623	11,898	682		2.38	
2010	1,392	1,606	2,998	27,751	32,547	60,298	29,143	34,153	63,296	1,580	12,823	679		2.33	
2011	1,377	1,384	2,761	24,477	29,795	54,272	25,854	31,179	57,033	1,446	12,047	693		2.09	
2012	1,816	1,287	3,103	21,682	27,148	48,830	23,498	28,435	51,933	1,360	12,246	694		1.96	
2013	3,203	1,080	4,283	21,268	26,353	47,621	24,471	27,433	51,904	1,354	12,350	700		1.93	
2014	2,951	1,276	4,227	21,652	25,478	47,130	24,603	26,754	51,357	1,451	12,677	711		2.04	
2015	2,472	1,413	3,885	21,356	22,490	43,846	23,828	23,903	47,731	1,417	13,089	744	5,934,209	1.90	0.0247
2016	2,669	1,526	4,195	21,332	22,465	43,797	24,002	23,991	47,992	1,434	13,339	769	6,544,667	1.86	0.0246
Forecast															
2022	2,993	1,711	4,704	23,154	24,424	47,578	26,147	26,135	52,282	1,474	14,727	868	8,058,740	1.70	0.0243
2027	3,025	1,729	4,754	24,595	25,878	50,473	27,620	27,607	55,227	1,428	15,726	945	9,152,191	1.51	0.0240
2032	2,991	1,710	4,701	26,269	27,537	53,807	29,260	29,247	58,508	1,376	16,786	1057	10,505,774	1.30	0.0239
2037	3,215	1,838	5,052	27,908	29,271	57,179	31,123	31,109	62,232	1,322	17,944	1181	13,130,262	1.12	0.0237
Compounded Annual Growth Rate															
2016-2037	0.9%	0.9%	0.9%	1.3%	1.3%	1.3%	1.2%	1.2%	1.2%	-0.4%	1.4%	2.1%	3.4%	-2.4%	-0.2%

(a) Assumed to increase at same rate as scheduled seat departures adjusted by ratio of FAA projected growth in Revenue Ton Miles (RTMs) on domestic passenger carriers divided by FAA projected growth in U.S. domestic available seat miles (ASMs).
(b) Total air cargo less belly cargo.
(c) Assumed to increase at same rate as U.S. Domestic Total Air Cargo RTMs adjusted by ratio of change in SJC Air Trade Area income to U.S. income.
(d) Table G.1.
(e) Tables G.1 and G.2.
(f) Table F.2 in Appendix F.
(g) US domestic passenger RTMs divided by US domestic ASMs.
(h) Ratio of SJC Air Trade Area Income to US income from Table A.8 in Appendix A.

Sources: As noted and HNTB analysis.

Table G.4 – Alternative Forecasts for U.S. International Air Cargo (millions of Revenue Ton Miles)

Year	FAA (a)	Boeing (b)	Airbus (c)	Average (d)
2015	22,858	22,858	22,858	22,858
2016	24,222	23,932	23,887	24,014
2017	25,775	25,057	24,962	25,265
2018	27,261	26,235	26,085	26,527
2019	28,775	27,468	27,259	27,834
2020	30,351	28,759	28,485	29,198
2021	31,825	30,111	29,767	30,568
2022	33,352	31,526	31,107	31,995
2023	35,000	33,007	32,506	33,505
2024	36,706	34,559	33,969	35,078
2025	38,369	36,183	35,498	36,683
2026	40,111	37,884	37,095	38,363
2027	41,929	39,664	38,764	40,119
2028	43,801	41,528	40,509	41,946
2029	45,706	43,480	42,332	43,839
2030	47,627	45,524	44,237	45,796
2031	49,601	47,663	46,227	47,831
2032	51,615	49,904	48,308	49,942
2033	53,715	52,249	50,481	52,148
2034	55,891	54,705	52,753	54,450
2035	58,137	57,276	55,127	56,847
2036	60,429	59,968	57,608	59,335
2037	62,721	62,786	60,200	61,902
Compounded Annual Growth Rate				
2015-2037	4.7%	4.7%	4.5%	4.6%

(a) Table G.1.
(b) Boeing, World Air Cargo Forecast: 2014-2015. Growth rate of 4.7 percent per year from base year.
(c) Airbus, Global Market Forecast: 2016-2035. Growth rate of 4.5 percent per year from base year.
(d) Average of FAA, Boeing, and Airbus forecasts.

Sources: As noted and HNTB analysis.

Table G.5 – Historical and Projected International Enplaned Cargo Tonnage (short tons) at SJC

	Belly (a)			Cargo Carrier (b)			Total (c)								
Year	Enplaned	Deplaned	Total	Enplaned	Deplaned	Total	Enplaned	Deplaned	Total	U.S. International Passenger RTMs (millions) (d)	U.S. International Total Air Cargo RTMs (millions) (e)	US International ASMs (billions) (d)	SJC International Seat Departures (f)	Ratio of US RTMs to ASMs (g)	Income Ratio (h)
2008	-	-	-	-	-	-	-	-	-	6,905	24,421	293		23.57	
2009	-	-	-	-	11	11	-	11	11	5,266	19,100	283		18.61	
2010	4	1	5	-	-	-	4	1	5	6,332	23,065	281		22.53	
2011	12	14	26	-	-	-	12	14	26	6,250	25,230	300		20.83	
2012	11	-	11	8	-	8	19	-	19	5,952	24,262	300		19.84	
2013	581	2,766	3,347	-	-	-	581	2,766	3,347	5,700	22,441	303		18.81	
2014	1,265	4,829	6,094	-	-	-	1,265	4,829	6,094	6,148	22,504	315		19.52	
2015	1,706	5,899	7,605	-	-	-	1,706	5,899	7,605	6,456	22,858	323	253,605	19.99	0.0248
2016	2,768	9,571	12,339	10	19	29	2,778	9,590	12,368	6,768	24,014	325	420,386	20.82	0.0248
2022	5,274	18,237	23,511	14	25	38	5,288	18,262	23,550	8,719	31,995	412	740,503	21.16	0.0245
2027	6,324	21,866	28,190	17	31	48	6,341	21,897	28,238	10,332	40,119	490	891,108	21.09	0.0242
2032	7,369	25,482	32,851	21	38	59	7,390	25,520	32,910	11,945	49,942	576	1,055,868	20.74	0.0240
2037	8,491	29,360	37,850	26	47	73	8,517	29,406	37,923	13,587	61,902	669	1,242,204	20.31	0.0240
										Compounded Annual Growth Rate					
2016-2037	5.5%	5.5%	5.5%	4.5%	4.5%	4.5%	5.5%	5.5%	5.5%	3.4%	4.6%	3.5%	5.3%	-0.1%	-0.2%

(a) Assumed to increase at same rate as scheduled SJC international seat departures adjusted by ratio of FAA projected growth in Revenue Ton Miles (RTMs) on international passenger carriers divided by FAA projected growth in U.S. international available seat miles (ASMs).
(b) Assumed to increase at same rate as U.S. International Total Air Cargo RTMs from Table G.4.
(c) Sum of passenger and all-cargo carrier tonnage.
(d) Table G.1.
(e) Tables G.1 and G.4.
(f) Table F.2 in Appendix F.
(g) US international passenger RTMs divided by US international ASMs.
(h) Ratio of SJC Air Trade Area Income to US income from Table A.8 in Appendix A.

Sources: As noted and HNTB analysis.

Table G.6 – SJC Air Cargo Summary (Short Tons)

Year	Belly			All-Cargo Carrier			Total		
	Enplaned	Deplaned	Total	Enplaned	Deplaned	Total	Enplaned	Deplaned	Total
Domestic									
2015	2,472	1,413	3,885	21,356	22,490	43,846	23,828	23,903	47,731
2016	2,669	1,526	4,195	21,332	22,465	43,797	24,002	23,991	47,992
2022	2,993	1,711	4,704	23,154	24,424	47,578	26,147	26,135	52,282
2027	3,025	1,729	4,754	24,595	25,878	50,473	27,620	27,607	55,227
2032	2,991	1,710	4,701	26,269	27,537	53,807	29,260	29,247	58,508
2037	3,215	1,838	5,052	27,908	29,271	57,179	31,123	31,109	62,232
International									
2015	1,706	5,899	7,605	-	-	-	1,706	5,899	7,605
2016	2,768	9,571	12,339	10	19	29	2,778	9,590	12,368
2022	5,274	18,237	23,511	14	25	38	5,288	18,262	23,550
2027	6,324	21,866	28,190	17	31	48	6,341	21,897	28,238
2032	7,369	25,482	32,851	21	38	59	7,390	25,520	32,910
2037	8,491	29,360	37,850	26	47	73	8,517	29,406	37,923
Total									
2015	4,178	7,312	11,490	21,356	22,490	43,846	25,534	29,802	55,336
2016	5,437	11,097	16,534	21,343	22,484	43,826	26,780	33,580	60,360
2022	8,267	19,948	28,215	23,167	24,449	47,616	31,435	44,397	75,831
2027	9,349	23,595	32,944	24,612	25,909	50,520	33,960	49,504	83,465
2032	10,361	27,192	37,553	26,290	27,575	53,865	36,651	54,767	91,418
2037	11,706	31,197	42,903	27,934	29,318	57,252	39,639	60,515	100,155

Sources: Tables G.3 and G.5.

Table G.7 – SJC Domestic All-Cargo Aircraft Departures by Equipment Type

	Capacity (Short Tons) (a)	2015	2016	2022	2027	2032	2037
CESSNA 208 CARAVAN	1.7	-					
MCDONNELL DOUGLAS DC-9-10	10.6		1				
BOEING 737-300	14.0		1				
BOEING 727-200	27.6		1				
AIRBUS INDUSTRIE A310-200C/F	40.1	-					
AIRBUS INDUSTRIE A300-600/R/CF/RCF	54.4	223	259	150	70		
AIRBUS A330-200	67.0					148	239
MCDONNELL DOUGLAS DC-10-10	70.1	37	180	-			
MCDONNELL DOUGLAS DC-10-30	85.3	28		-			
MCDONNELL DOUGLAS MD-10	85.3		7				
MCDONNELL DOUGLAS MD-11	99.0	3	4	5	5	-	-
BOEING 757-200	44.0	67	60	100	100	50	-
BOEING 767-200	54.4		5				
BOEING 767-300/300ER	65.0	399	286	605	723	723	723
BOEING 777-200/200LR	103.0	-			10	15	20
BOEING 747-400	120.3		4	5	5	5	-
Total Departures		757	808	865	913	941	982
Total Operations		1,542	1,616	1,730	1,826	1,882	1,964
Enplaned Cargo Tonnage (b)		21,356	21,343	23,167	24,612	26,290	27,934
Load Factor (c)		46.1%	42.9%	42.9%	42.9%	42.9%	42.9%
Required All-Cargo Capacity (d)		46,293	49,736	53,988	57,354	61,265	65,096

(a) FAA Economic Values for Evaluation of Federal Aviation Administration Investment and Regulatory Decisions and HNTB research.
(b) Table G.6.
(c) Assumed to remain constant.
(d) Enplaned cargo tonnage divided by load factor.

Sources: USDOT T100 data as compiled by DataBase Products and HNTB analysis.

APPENDIX H: SJC GENERAL AVIATION FORECAST

This appendix provides additional detail on the general aviation forecast discussed in Section 8.

Tables H.1 and **H.2** present the FAA national forecasts of the number of aircraft in the general aviation fleet and the anticipated hours flown by these aircraft. **Table H.3** shows forecast hours flown by aircraft type, which are calculated by dividing the total hours flown in **Table H.2** by the aircraft fleet in **Table H.1**.

The projection of SJC based aircraft is displayed in **Table H.4.** Based aircraft in each category were projected to grow at the same rate as the FAA forecast of U.S. aircraft in that category, and then adjusted by the ratio of SJC air trade area income to U.S. income to account for local economic conditions.

An estimate of base year general aviation aircraft operations by category was needed prior to developing the operations forecast. **Table H.5** demonstrates how the estimate was prepared. The Airport's ANOMS database used for noise tracking effectively accounts for all high-performance aircraft that fly under instrument flight rules (IFR). However, some light piston aircraft fly under visual flight rules (VFR) and are not always captured in the ANOMS data.

The base year operations estimate in Table H.5 assumes that all turbine powered aircraft (jets and turboprops) are included in the ANOMS data. The difference between total general aviation operations and ANOMS-derived turbine operations was distributed among single-engine piston, multi-engine piston, and rotor aircraft in accordance with their based aircraft numbers. All local operations were assumed to be piston-powered or helicopter.

Table H.6 shows the calculations associated with the forecast of general aviation aircraft operations. The estimated base year operations from Table I.5 were assumed to increase at the same rate as the based aircraft forecast adjusted by the anticipated change in utilization per aircraft (FAA hours flown/aircraft). The same approach was applied to itinerant and local operations.

Table H.7 provides the general aviation fleet mix forecast. Operations in each major category (single-engine piston, multi-engine piston, etc.) are based on the results in Table H.6. Within each category, operations by older out-of-production aircraft were projected to decline, whereas operations by newer aircraft that are still in production were assumed to increase.

Table H.1 – FAA Forecast of National General Aviation Fleet

Year	Single Engine Piston	Multi-Engine Piston	Turboprop	Turbojet	Rotor	Other	Total
2008	145,497	17,515	8,907	11,042	9,876	35,827	228,664
2009	140,649	16,474	9,055	11,268	9,984	36,446	223,876
2010	139,519	15,900	9,369	11,484	10,102	36,996	223,370
2011	136,895	15,702	9,523	11,650	10,082	36,601	220,453
2012	128,847	14,313	10,304	11,793	10,055	33,722	209,034
2013	124,398	13,257	9,619	11,637	9,765	31,251	199,927
2014	126,036	13,146	9,777	12,362	9,966	33,121	204,408
2015	125,050	13,085	9,570	12,475	10,240	33,460	203,880
2016	124,055	13,025	9,420	12,635	10,540	33,750	203,425
2017	123,140	12,955	9,310	12,870	10,845	34,180	203,300
2018	122,245	12,905	9,235	13,125	11,140	34,550	203,200
2019	121,365	12,855	9,195	13,395	11,430	34,945	203,185
2020	120,485	12,810	9,190	13,680	11,710	35,320	203,195
2021	119,585	12,760	9,215	13,975	11,985	35,705	203,225
2022	118,690	12,715	9,270	14,285	12,260	36,120	203,340
2023	117,785	12,655	9,350	14,610	12,535	36,430	203,365
2024	116,875	12,595	9,465	14,965	12,805	36,850	203,555
2025	115,960	12,545	9,600	15,340	13,080	37,220	203,745
2026	115,045	12,480	9,775	15,735	13,355	37,640	204,030
2027	114,130	12,420	9,985	16,150	13,630	38,080	204,395
2028	113,225	12,340	10,205	16,580	13,905	38,580	204,835
2029	112,345	12,260	10,440	17,040	14,180	38,925	205,190
2030	111,495	12,175	10,705	17,520	14,450	39,430	205,775
2031	110,685	12,095	10,990	18,015	14,730	39,895	206,410
2032	109,905	12,015	11,295	18,520	15,020	40,365	207,120
2033	109,155	11,930	11,610	19,045	15,320	40,825	207,885
2034	108,445	11,850	11,935	19,600	15,620	41,310	208,760
2035	107,780	11,765	12,280	20,175	15,935	41,750	209,685
2036	107,160	11,695	12,635	20,770	16,255	42,180	210,695
2037 (a)	*106,540*	*11,625*	*12,990*	*21,365*	*16,575*	*42,610*	*211,705*
Compounded Annual Growth Rate							
2015-2037	-0.7%	-0.5%	1.4%	2.5%	2.2%	1.1%	0.2%

(a) Extrapolated at 2035-2036 growth rate.

Source: FAA Aerospace Forecasts: Fiscal Years 2016-2036. Table 28.

Table H.2 – FAA Forecast of National General Aviation Hours Flown (in thousands)

Year	Single Engine Piston	Multi-Engine Piston	Turboprop	Turbojet	Rotor	Other	Total
2008	12,746	2,328	2,457	3,600	3,222	1,656	26,009
2009	11,730	1,903	2,215	3,161	3,003	1,751	23,763
2010	12,161	1,818	2,325	3,375	3,405	1,718	24,802
2011	11,844	1,782	2,463	3,407	3,411	1,663	24,570
2012	11,442	1,766	2,733	3,418	3,454	1,591	24,404
2013	10,706	1,646	2,587	3,488	2,949	1,500	22,876
2014	10,395	1,573	2,613	3,881	3,242	1,567	23,271
2015	10,312	1,555	2,582	3,913	3,240	1,594	23,196
2016	10,225	1,541	2,564	4,016	3,323	1,631	23,300
2017	10,151	1,530	2,556	4,164	3,417	1,672	23,490
2018	10,084	1,519	2,554	4,315	3,531	1,711	23,714
2019	10,023	1,510	2,561	4,464	3,645	1,753	23,956
2020	9,946	1,505	2,570	4,619	3,766	1,795	24,201
2021	9,879	1,497	2,589	4,771	3,885	1,840	24,461
2022	9,800	1,495	2,611	4,921	3,999	1,882	24,708
2023	9,724	1,492	2,639	5,068	4,112	1,925	24,960
2024	9,650	1,490	2,671	5,227	4,213	1,972	25,223
2025	9,596	1,489	2,710	5,389	4,313	2,016	25,513
2026	9,536	1,489	2,764	5,548	4,415	2,061	25,813
2027	9,483	1,491	2,824	5,707	4,515	2,113	26,133
2028	9,424	1,492	2,885	5,877	4,614	2,162	26,454
2029	9,368	1,494	2,954	6,056	4,712	2,204	26,788
2030	9,321	1,496	3,032	6,236	4,807	2,251	27,143
2031	9,285	1,496	3,113	6,425	4,905	2,297	27,521
2032	9,240	1,498	3,198	6,610	5,005	2,345	27,896
2033	9,197	1,500	3,288	6,800	5,109	2,391	28,285
2034	9,158	1,502	3,379	6,994	5,212	2,442	28,687
2035	9,146	1,503	3,478	7,216	5,321	2,488	29,152
2036	9,119	1,505	3,575	7,422	5,430	2,531	29,582
2037 (a)	*9,092*	*1,507*	*3,672*	*7,628*	*5,539*	*2,574*	*30,012*
Compounded Annual Growth Rate							
2015-2037	-0.6%	-0.1%	1.6%	3.1%	2.5%	2.2%	1.2%

(a) Extrapolated at 2035-2036 growth rate.

Source: FAA Aerospace Forecasts: Fiscal Years 2016-2036. Table 29.

Table H.3 – FAA Hours Flown per Aircraft (a)

Year	Single Engine Piston	Multi-Engine Piston	Turboprop	Turbojet	Rotor	Other	Total
2008	87.6	132.9	275.9	326.0	326.2	46.2	113.7
2009	83.4	115.5	244.6	280.5	300.8	48.0	106.1
2010	87.2	114.3	248.2	293.9	337.1	46.4	111.0
2011	86.5	113.5	258.6	292.4	338.3	45.4	111.5
2012	88.8	123.4	265.2	289.8	343.5	47.2	116.7
2013	86.1	124.2	268.9	299.7	302.0	48.0	114.4
2014	82.5	119.7	267.3	313.9	325.3	47.3	113.8
2015	82.5	118.8	269.8	313.7	316.4	47.6	113.8
2016	82.4	118.3	272.2	317.8	315.3	48.3	114.5
2017	82.4	118.1	274.5	323.5	315.1	48.9	115.5
2018	82.5	117.7	276.6	328.8	317.0	49.5	116.7
2019	82.6	117.5	278.5	333.3	318.9	50.2	117.9
2020	82.5	117.5	279.7	337.6	321.6	50.8	119.1
2021	82.6	117.3	281.0	341.4	324.2	51.5	120.4
2022	82.6	117.6	281.7	344.5	326.2	52.1	121.5
2023	82.6	117.9	282.2	346.9	328.0	52.8	122.7
2024	82.6	118.3	282.2	349.3	329.0	53.5	123.9
2025	82.8	118.7	282.3	351.3	329.7	54.2	125.2
2026	82.9	119.3	282.8	352.6	330.6	54.8	126.5
2027	83.1	120.0	282.8	353.4	331.3	55.5	127.9
2028	83.2	120.9	282.7	354.5	331.8	56.0	129.1
2029	83.4	121.9	283.0	355.4	332.3	56.6	130.6
2030	83.6	122.9	283.2	355.9	332.7	57.1	131.9
2031	83.9	123.7	283.3	356.6	333.0	57.6	133.3
2032	84.1	124.7	283.1	356.9	333.2	58.1	134.7
2033	84.3	125.7	283.2	357.0	333.5	58.6	136.1
2034	84.4	126.8	283.1	356.8	333.7	59.1	137.4
2035	84.9	127.8	283.2	357.7	333.9	59.6	139.0
2036	85.1	128.7	282.9	357.3	334.1	60.0	140.4
2037	85.3	129.6	282.7	357.0	334.2	60.4	141.8
Compounded Annual Growth Rate							
2016-2037	0.2%	0.4%	0.2%	0.6%	0.3%	1.1%	1.0%

(a) Hours flown from Table H.2 divided by aircraft in Table H.1.

Sources: As noted and HNTB analysis.

Table H.4 – Forecast of General Aviation Based Aircraft at SJC (a)

Year	Single Engine Piston	Multi-Engine Piston	Turboprop	Turbojet	Rotor	Other	Total	Income Ratio (b)
2015 (c)	62	8	5	57	4	0	136	
2016 (c)	62	9	8	53	5	0	137	
2022	59	9	8	59	6	0	141	
2027	56	8	8	66	6	0	144	
2032	53	8	9	75	7	0	152	
2037	51	8	11	86	8	0	164	
Compounded Annual Growth Rate								
2016-2037	-0.9%	-0.6%	1.5%	2.3%	2.3%		0.9%	
FAA Fleet (d)								
2015	125,050	13,085	9,570	12,475	10,240	33,460	203,880	0.025
2016	124,055	13,025	9,420	12,635	10,540	33,750	203,425	0.025
2022	118,690	12,715	9,270	14,285	12,260	36,120	203,340	0.024
2027	114,130	12,420	9,985	16,150	13,630	38,080	204,395	0.024
2032	109,905	12,015	11,295	18,520	15,020	40,365	207,120	0.024
2037	106,540	11,625	12,990	21,365	16,575	42,610	211,705	0.024

(a) Each category projected to grow at same rate as FAA fleet adjusted by income ratio.
(b) Table F.2 in Appendix F.
(c) Table C.14 in Appendix C.
(d) Table H.1.

Sources: As noted and HNTB analysis.

Table H.5 – Estimated 2015 SJC General Aviation Aircraft Operations by Category

Category	Based Aircraft (a)	Estimated Itinerant Operations (b)	Estimated Local Operations (c)	Total Operations
Single Engine Piston	62	4,539	3,559	8,098
Multi-Engine Piston	9	794	517	1,311
Turboprop	8	2,292	-	2,292
Turbojet	53	21,733	-	21,733
Rotor	5	22	287	309
Other	-	-	-	-
Total (d)	137	29,380	4,363	33,743

(a) Table H.4.
(b) Aircraft distribution assumed to be the same as in ANOMS data.
(c) Local operations distributed among single-engine piston, multi-engine piston, and rotor aircraft in accordance with based aircraft distributions.
(d) Total itinerant and local operations from Table C.15 in Appendix C.

Sources: As noted and HNTB analysis.

Table H.6 – Forecast of SJC General Aviation Aircraft Operations

Year	Single Engine Piston	Multi-Engine Piston	Turboprop	Turbojet	Rotor	Other	Total
Based Aircraft (a)							
2015	62	8	5	57	4	0	136
2016	62	9	8	53	5	0	137
2022	59	9	8	59	6	0	141
2027	56	8	8	66	6	0	144
2032	53	8	9	75	7	0	152
2037	51	8	11	86	8	0	164
FAA Hours/Aircraft (b)							
2015	82.5	118.8	269.8	313.7	316.4	47.6	
2016	82.4	118.3	272.2	317.8	315.3	48.3	
2022	82.6	117.6	281.7	344.5	326.2	52.1	
2027	83.1	120.0	282.8	353.4	331.3	55.5	
2032	84.1	124.7	283.1	356.9	333.2	58.1	
2037	85.3	129.6	282.7	357.0	334.2	60.4	
Itinerant Operations (c)							
2015							29,587
2016	4,539	794	2,292	21,733	22	-	29,380
2022	4,327	789	2,372	26,221	27	-	33,736
2027	4,133	716	2,382	30,089	28	-	37,347
2032	3,958	744	2,682	34,534	33	-	41,950
2037	3,866	773	3,273	39,612	37	-	47,562
Local Operations (c)							
2015							4,400
2016	3,559	517	-	-	287	-	4,363
2022	3,393	514	-	-	356	-	4,263
2027	3,241	466	-	-	362	-	4,069
2032	3,103	484	-	-	425	-	4,012
2037	3,031	504	-	-	487	-	4,021
Total Operations							
2015	-	-	-	-	-	-	33,987
2016	8,098	1,311	2,292	21,733	309	-	33,743
2022	7,720	1,303	2,372	26,221	383	-	37,999
2027	7,373	1,182	2,382	30,089	390	-	41,416
2032	7,061	1,228	2,682	34,534	458	-	45,963
2037	6,897	1,277	3,273	39,612	524	-	51,583
Compounded Annual Growth Rate							
2016-2037	-0.8%	-0.1%	1.7%	2.9%	2.5%		2.0%

(a) Table H.4.
(b) Table H.3.
(c) 2016 operations from Table H.5. Projected to increase at same rate as based aircraft adjusted by change in utilization (hours/aircraft).

Sources: As noted and HNTB analysis.

Table H.7 – Forecast of General Aviation Operations Fleet Mix (1 of 2)

Aircraft Types	Aircraft Operations 2016	2022	2027	2032	2037
Single Engine Piston					
Beechcraft Bonanza 33	171	160	155	145	130
Beechcraft Bonanza 35	745	700	550	400	270
Beechcraft Bonanza 36	946	900	850	800	750
Bellanca Viking	105	110	115	125	140
Cessna 172	1,124	1,000	900	800	720
Cessna 182 SEPV	642	600	600	600	600
Cessna 206	345	340	340	340	340
Cessna 210 SEPV	619	550	500	450	413
Cirrus SR22	877	950	1,060	1,200	1,400
Extra EA-300	127	140	140	150	160
Grumman AA-5 Tiger	190	170	150	120	100
Mooney Mark 20	298	280	260	240	220
Piper Cherokee	147	140	140	140	140
Piper Cherokee Warior	126	120	120	120	120
Piper Malibu	117	110	100	90	80
Piper Saratoga	187	180	180	180	180
Other Single Engine Piston	1,332	1,270	1,213	1,161	1,134
Subtotal	8,098	7,720	7,373	7,061	6,897
Multi-Engine Piston					
Beechcraft 55 Baron	107	100	80	75	70
Beechcraft 58 Baron	392	418	420	472	530
Cessna 310	106	100	80	75	70
Cessna 340	137	130	105	100	90
Cessna Golden Eagle 421	146	135	115	110	105
Other Multi Engine Piston	423	420	382	396	412
Subtotal	1,311	1,303	1,182	1,228	1,277
Turboprop					
Beechcraft 200 Super King Air	240	240	240	240	240
Beechcraft King Air 90	154	155	155	155	155
Beechcraft Super King Air 300	132	130	125	120	115
Pilatus PC 12	820	864	870	1,000	1,343
Piper Cheyenne 2	100	100	100	100	100
Raytheon Beechcraft King Air 350	447	470	477	600	750
Other Turboprop	399	413	415	467	570
Subtotal	2,292	2,372	2,382	2,682	3,273

Table H.7 – Forecast of General Aviation Operations Fleet Mix (2 of 2)

Aircraft Types	Aircraft Operations 2016	2022	2027	2032	2037
Jet					
Beechcraft Beechjet 400	347	350	350	350	350
Bombardier Challenger 300	1,285	1,800	2,200	2,700	3,250
Bombardier Challenger 350	267	400	500	608	750
Bombardier Global 5000	195	300	400	500	620
Bombardier Global Express	668	1,000	1,250	1,600	2,000
Canadair Bombardier CL600/610	788	800	800	800	800
Cessna Citation 510 Mustang	152	250	350	450	560
Cessna Citation 550	153	150	150	150	150
Cessna Citation 560 Ultra	502	500	500	500	500
Cessna Citation 560XL Excel	1,822	2,400	2,900	3,400	3,950
Cessna Citation 680 Sovereign	656	900	1,200	1,550	1,950
Cessna Citation 750	1,412	2,238	2,663	3,100	3,650
Cessna Citation CJ1	420	400	350	300	250
Cessna Citation CJ2	156	150	150	150	150
Cessna Citation CJ3	393	400	400	400	400
Dassault Falcon 2000	1,101	1,500	1,900	2,350	2,850
Dassault Falcon 50	174	150	125	100	75
Dassault Falcon 7X	277	350	450	550	660
Dassault Falcon 900	623	600	600	600	600
Embraer EMB-145XR	2,592	2,600	2,600	2,600	2,600
Embraer ERJ-145	110	100	100	100	100
Embraer Phenom 100	1,055	1,050	1,050	1,050	1,050
Embraer Phenom 300	697	950	1,300	1,700	2,150
Gulfstream G280	107	150	200	260	330
Gulfstream IV	1,285	1,300	1,300	1,300	1,300
Gulfstream V	1,373	1,800	2,200	2,650	3,150
Gulfstream VI	378	550	700	900	1,114
IAI 1126 Astra Galaxy/Gulfstream 200	372	370	370	370	370
IAI Gulfstream G150 (Astra)	112	150	200	260	330
Learjet 35	166	150	130	110	90
Learjet 45	204	300	400	560	750
Learjet 60	257	260	260	260	260
Raytheon Hawker 800	579	580	580	580	580
Other Jet	1,055	1,273	1,461	1,676	1,923
	21,733	26,221	30,089	34,534	39,612
Helicopter	309	383	390	458	524
Total	33,743	37,999	41,416	45,963	51,583

Sources: SJC ANOMS data, Table H.6, and HNTB analysis.

APPENDIX I: SJC MILITARY FORECAST

Table I.1 provides additional detail for the military operations forecast described in Section 8.

Table I.1 – Forecast of SJC Military Aircraft Operations

Year	Total
2015	236
2016	276
2022	250
2027	250
2032	250
2037	250
Compounded Annual Growth Rate	
2016-2037	-0.5%

Source: HNTB analysis.

APPENDIX J: LANDED WEIGHT FORECAST

Table J.1 provides a detailed breakout of the landed weight forecast organized by aircraft equipment type.

Table J.1 – SJC Landed Weight Forecasts (1 of 2)

Aircraft Types	Maximum Gross Landing Weight (pounds) (a)	Aircraft Landings (b)					Landed Weight (1000 lbs) (c)				
		2015	2022	2027	2032	2037	2015	2022	2027	2032	2037
AIRBUS A330-200	401,241	-	167	548	580	767	-	67,007	219,880	232,720	307,752
AIRBUS A340-300	423,000	-	266	-	-	-	-	112,518	-	-	-
AIRBUS A350-900	456,000	-	157	421	612	777	-	71,592	191,976	279,072	354,312
AIRBUS INDUSTRIE A300-600/R/CF/RCF	308,647	223	150	70	-	-	68,828	46,297	21,605	-	-
AIRBUS INDUSTRIE A319	138,000	957	2,511	1,578	76	44	132,066	346,518	217,764	10,488	6,072
AIRBUS INDUSTRIE A319 neo	140,900	-	-	517	1,535	1,950	-	-	72,845	216,282	274,755
AIRBUS INDUSTRIE A320-100/200	146,000	2,445	3,725	3,069	1,986	906	356,970	543,850	448,074	289,956	132,276
AIRBUS INDUSTRIE A320neo	148,600	-	504	835	1,427	1,417	-	74,894	124,081	212,052	210,566
AIRBUS INDUSTRIE A321	172,000	57	225	679	790	1,628	9,804	38,700	116,788	135,880	280,016
AIRBUS INDUSTRIE A321neo	174,600	-	1,029	1,276	2,394	4,019	-	179,663	222,790	417,992	701,717
B787-900 DREAMLINER	425,000	15	240	6	-	85	6,375	102,000	2,550	-	36,125
BOEING 717-200	110,000	444	1,432	1,460	-	-	48,840	157,520	160,600	-	-
BOEING 737-300	114,000	4,510	-	-	-	-	514,140	-	-	-	-
BOEING 737-400	124,000	1,535	16	6	-	-	190,340	1,984	744	-	-
BOEING 737-500	110,000	13	9	6	-	-	1,430	990	660	-	-
BOEING 737-7 MAX	145,600	-	765	2,849	5,478	12,983	-	111,384	414,814	797,597	1,890,325
BOEING 737-700/700LR	134,000	17,609	21,551	18,585	14,462	5,459	2,359,606	2,887,834	2,490,390	1,937,908	731,506
BOEING 737-8 MAX	152,800	-	2,256	5,179	11,479	20,732	-	344,717	791,351	1,753,991	3,167,850
BOEING 737-800	146,300	5,018	11,711	11,901	11,990	11,760	734,133	1,713,319	1,741,116	1,754,137	1,720,488
BOEING 737-9 MAX	163,900	-	365	1,640	4,034	8,510	-	59,824	268,796	661,173	1,394,789
BOEING 737-900ER	157,300	356	1,617	2,482	1,795	3,427	55,999	254,354	390,419	282,354	539,067
BOEING 747-400	652,111	3	8	8	8	3	1,956	5,217	5,217	5,217	1,956
BOEING 757-200	196,025	261	106	106	54	2	51,162	20,779	20,779	10,585	392
BOEING 757-300	224,028	22	4	4	4	2	4,929	896	896	896	448
BOEING 767-200/200ER	270,000	1	1	1	-	-	270	270	270	-	-
BOEING 767-300/300ER	300,056	1,132	618	740	748	755	339,664	185,435	222,042	224,442	226,543
BOEING 767-400	350,039	9	11	13	15	20	3,150	3,850	4,551	5,251	7,001
BOEING 777-200/200LR	492,000	1	2	14	21	30	492	984	6,888	10,332	14,760
BOEING 777-300ER	554,000	-	155	-	237	377	-	85,870	-	131,298	208,858
BOEING 787-1000 DREAMLINER	445,000	-	335	359	128	-	-	149,075	159,755	56,960	-
BOEING 787-800 DREAMLINER	380,000	455	278	910	1,023	1,010	172,900	105,640	345,800	388,740	383,800
BOEING737-900	157,300	616	5	6	8	13	96,897	787	944	1,258	2,045
BOMBARDIER CS100	115,000	-	84	3,207	6,698	7,104	-	9,660	368,805	770,270	816,960
CANADAIR RJ-200ER /RJ-440	47,008	1,728	105	-	-	-	81,231	4,936	-	-	-
CANADAIR RJ-700	67,000	1,850	1	1	1	-	123,950	67	67	67	-
CANADAIR RJ-900	75,100	2,818	1,297	1,071	105	15	211,632	97,405	80,432	7,886	1,127
DEHAVILLAND DHC8-400 DASH-8	62,000	1,653	1,568	1,549	830	125	102,486	97,216	96,038	51,460	7,750

Table J.1 – SJC Landed Weight Forecasts (2 of 2)

Aircraft Types	Maximum Gross Landing Weight (pounds) (a)	Aircraft Landings (b)					Landed Weight (1000 lbs) (c)				
		2015	2022	2027	2032	2037	2015	2022	2027	2032	2037
EMBRAER 170	72,324	20	-	-	-	-	1,446	-	-	-	-
EMBRAER 190	107,431	6	10	13	15	17	645	1,074	1,397	1,611	1,826
EMBRAER-175	88,185	1,218	9,883	10,678	10,444	8,859	107,409	871,532	941,639	921,004	781,231
MCDONNELL DOUGL DC9 SUPER 80/MD81/2/3/8	139,532	1,637	6	4	-	-	228,415	837	558	-	-
MCDONNELL DOUGLAS DC-10-10	363,500	37	-	-	-	-	13,450	-	-	-	-
MCDONNELL DOUGLAS DC-10-30	403,000	28	-	-	-	-	11,284	-	-	-	-
MCDONNELL DOUGLAS MD-11	491,500	3	5	5	-	-	1,475	2,458	2,458	-	-
MCDONNELL DOUGLAS MD80	139,532	1	-	-	-	-	140	-	-	-	-
MCDONNELL DOUGLAS MD-90	142,024	469	621	-	-	-	66,609	88,197	-	-	-
OTHER		130	123	133	138	146	-	-	-	-	-
Total		47,280	63,922	71,929	79,115	92,942	5,997,644	8,698,524	9,985,168	11,374,529	13,963,723

(a) HNTB research of aircraft specifications.
(b) Tables F.12 and G.7. Landings assumed to equal departures.
(c) Aircraft landings multiplied by maximum gross landing weight.

Sources: As noted and HNTB analysis.

APPENDIX K: PEAK ACTIVITY FORECASTS

The peak activity forecasts were based on DDFSs prepared for the average weekday in the peak month for the base year (2016) and 2037. The AWDPM for the Airport typically occurs in July or August. However, peak activity for cargo occurs in December and peak activity for general aviation tends to be evenly distributed from April through October.

The DDFSs contained the following information on a flight-by-flight basis:

- Time of arrival at and departure from SJC
- Airline
- Aircraft type
- Origin and destination
- Domestic/International/Pre-cleared designation

The following assumptions and procedures were used to prepare the design day schedules:

- The air service projections (see Section 6 and Appendix F) provided the projections of design day aircraft departures by market, airline, and aircraft type.
- July 2016 Official Airline Guide (OAG) schedules were used as the initial source of flight times for the future schedules.
- Scheduled times for new flights in existing markets were estimated using the following approach:
    - New flights were scheduled to avoid two flights in the same connecting bank by the same airline in each market.
    - Flights were scheduled to avoid take-offs and landings during the SJC curfew and nighttime (2300-0600) at the destination market.
    - New flights for legacy carriers to their respective hubs were scheduled to be consistent with their existing directional connecting bank structure.
- Scheduled times for flights in new markets were estimated using the following approach:
    - Flights were scheduled to avoid take-offs and landings during the SJC curfew or nighttime (2300-0600) at the destination market.
    - New flights for legacy carriers to their respective hubs were scheduled to be consistent with their existing directional connecting bank structure.
- Aircraft turnarounds (determination of which arriving flight becomes which departing flight) were estimated using the following approach:
    - Based on current practice, international wide-body aircraft turnarounds were assumed to last no less than 1 hour and 40 minutes.

- Based on current practice, narrow-body turnarounds were scheduled to last no less than 35 minutes. This assumption varied depending on the airline and its current practices.
- Based on current practice, regional aircraft turnarounds were scheduled to last no less than 25 minutes.

Enplaned and deplaned passengers were assigned to each flight based on existing load factors by airline for each market, with an adjustment for the projected increase in average load factor over the forecast period. The split between O&D and connecting passengers for each market was based on each carrier's average ratio of originating to enplaning passengers.

The results of the DDFS analyses were aggregated to develop peak passenger and aircraft operations activity forecasts which are summarized in **Tables K.1 and K.2**.

The peak passenger forecasts in Table K.1 assume that, consistent with past trends, the peak month share of annual passengers will not change. Consequently, the design day share of annual passengers also remains constant. Peak 60-minute enplanements, deplanements, and origin destination passengers are projected to decline as a share of design day passengers because of peak spreading.

The peak aircraft operations forecasts in Table K.2 also assume that the peak month share of annual operations in the passenger, cargo, GA, and military categories will remain constant. Peak 60-minute operations, however, are projected to grow more slowly than design day operations because of peak spreading.

Table K.1 – Peak Passenger Activity Forecast

Activity Category	2016	2022	2027	2032	2037
Annual Enplanements (a)	5,377,433	6,854,325	7,847,623	9,053,079	11,266,037
Peak Month Enplanements (b)	494,222	635,430	727,514	839,266	1,044,418
ADPM Enplanements (c)	15,943	20,498	23,468	27,073	33,691
Design Day Enplanements (d)	16,901	21,730	24,878	28,700	35,715
Design Day Originations (e)	16,208	20,839	23,858	27,523	34,251
Peak 60 Minute Enplanements (f)	1,844	2,330	2,628	2,986	3,660
Peak 60 Minute Originations (f)	1,765	2,230	2,515	2,858	3,502
Annual Deplanements (g)	5,419,292	6,854,325	7,847,623	9,053,079	11,266,037
Peak Month Deplanements (g)	505,472	635,430	727,514	839,266	1,044,418
ADPM Deplanements (c)	16,306	20,498	23,468	27,073	33,691
Design Day Deplanements (d)	17,286	21,730	24,878	28,700	35,715
Design Day Terminations (e)	16,577	20,839	23,858	27,523	34,251
Peak 60 Minute Deplanements (f)	2,219	2,635	2,870	3,141	3,698
Peak 60 Minute Terminations (f)	2,121	2,521	2,749	3,011	3,549
Annual Passengers (h)	10,796,725	13,708,650	15,695,246	18,106,158	22,532,074
Peak Month Passengers (h)	999,694	1,270,860	1,455,028	1,678,532	2,088,836
ADPM Passengers (h)	32,249	40,996	46,936	54,146	67,382
Design Day Passengers (h)	34,187	43,460	49,756	57,400	71,430
Design Day O&D (e)	32,785	41,678	47,716	55,046	68,502
Peak 60 Minute Passengers (f)	2,933	3,656	4,116	4,668	5,709
Peak 60 Minute O&D (f)	2,819	3,518	3,965	4,502	5,513

(a) Table T.5.
(b) Based on 2011-2015 ratio of peak month to annual enplanements.
(c) Peak month divided by 31 days
(d) Average day peak month (ADPM) enplanements and deplanements increased by 6.01 percent to represent an average **weekday** in the peak month. Weekdays are typically busier than weekends or the average day.
(e) Assumes 4.1 percent connecting percentage.
(f) Based on 2016 and 2037 design day flight schedules with intermediate years interpolated.
(g) Numbers for 2016 from San Jose International Airport. Future years assumed to equal enplanements.
(h) Sum of enplanements and deplanements.

Sources: As noted and HNTB analysis.

Table K.2 – Peak Aircraft Operations Activity Forecast

Activity Category	2016	2022	2027	2032	2037
Passenger					
Annual Operations (a)	103,280	126,114	142,032	156,348	183,920
Peak Month Operations (b)	9,274	11,471	12,919	14,222	16,730
ADPM Operations (c)	299	370	417	459	540
Design Day Operations (d)	324	403	454	500	588
Peak 60 Minute Arrivals (e)	19	23	25	26	30
Peak 60 Minute Departures (e)	17	21	23	24	28
Peak 60 Minute Operations (e)	26	32	36	40	47
Cargo					
Annual Operations (a)	1,616	1,730	1,826	1,882	1,964
Peak Month Operations (b)	176	213	225	232	242
ADPM Operations (c)	6	7	7	7	8
Design Day Operations (d)	8	10	10	10	11
Peak 60 Minute Arrivals (e)	3	4	4	4	5
Peak 60 Minute Departures (e)	3	3	3	3	3
Peak 60 Minute Operations (e)	4	5	5	5	6
General Aviation					
Annual Operations (a)	33,743	37,999	41,416	45,963	51,583
Peak Month Operations (b)	3,337	4,079	4,446	4,934	5,537
ADPM Operations (c)	108	132	143	159	179
Design Day Operations (d)	155	189	205	228	257
Peak 60 Minute Arrivals (e)	11	13	14	15	17
Peak 60 Minute Departures (e)	11	13	14	16	18
Peak 60 Minute Operations (e)	20	24	26	29	32
Military					
Annual Operations (a)	276	250	250	250	250
Peak Month Operations (b)	40	30	30	30	30
ADPM Operations (c)	1	1	1	1	1
Design Day Operations (d)	1	1	1	1	1
Peak 60 Minute Arrivals (e)	-	-	-	-	-
Peak 60 Minute Departures (e)	-	-	-	-	-
Peak 60 Minute Operations (e)	-	-	-	-	-
Total					
Annual Operations (a)	138,915	166,093	185,524	204,443	237,717
Peak Month Operations (b)	12,753	14,774	16,502	18,185	21,144
ADPM Operations (c)	411	477	532	587	682
Design Day Operations (d)	487	602	669	738	856
Peak 60 Minute Arrivals (e)	21	26	29	33	38
Peak 60 Minute Departures (e)	23	28	30	32	36
Peak 60 Minute Operations (e)	43	52	58	63	72

(a) Table T.9.
(b) Based on peak month percentage in Table C.16.
(c) Peak month divided by 31 days.
(d) Average **weekday** in peak month based on OAG and FAA data. Weekdays are typically busier than weekends or average days. In addition, SJC does not collect operations data on a daily basis so FAA tower data was used for design day GA operations.
(e) Based on 2016 and 2037 design day flight schedules with intermediate years interpolated.

Sources: As noted and HNTB analysis.

APPENDIX L: FLEET MIX SUMMARY

Table L.1 provides an aggregate fleet mix forecast that combines the passenger forecasts in Table F.12, the cargo forecasts in Table G.7, and the general aviation forecasts in Table H.7.

Table L.1 – Summary of Fleet Mix Forecast (1 of 3)

	Aircraft Operations				
Aircraft Types	**2015 (a)**	**2022**	**2027**	**2032**	**2037**
Commercial (Passenger and Cargo)					
AIRBUS A330-200	-	334	1,096	1,160	1,534
AIRBUS A340-300	-	532	-	-	-
AIRBUS A350-900	-	314	842	1,224	1,554
AIRBUS INDUSTRIE A300-600/R/CF/RCF	446	300	140	-	-
AIRBUS INDUSTRIE A319	1,914	5,022	3,156	152	88
AIRBUS INDUSTRIE A319 neo	-	-	1,034	3,070	3,900
AIRBUS INDUSTRIE A320-100/200	4,890	7,450	6,138	3,972	1,812
AIRBUS INDUSTRIE A320neo	-	1,008	1,670	2,854	2,834
AIRBUS INDUSTRIE A321	114	450	1,358	1,580	3,256
AIRBUS INDUSTRIE A321neo	-	2,058	2,552	4,788	8,038
B787-900 DREAMLINER	30	480	12	-	170
BOEING 717-200	888	2,864	2,920	-	-
BOEING 737-300	9,020	-	-	-	-
BOEING 737-400	3,070	32	12	-	-
BOEING 737-500	26	18	12	-	-
BOEING 737-7 MAX	-	1,530	5,698	10,956	25,966
BOEING 737-700/700LR	35,218	43,102	37,170	28,924	10,918
BOEING 737-8 MAX	-	4,512	10,358	22,958	41,464
BOEING 737-800	10,036	23,422	23,802	23,980	23,520
BOEING 737-9 MAX	-	730	3,280	8,068	17,020
BOEING 737-900ER	712	3,234	4,964	3,590	6,854
BOEING 747-400	6	16	16	16	6
BOEING 757-200	522	212	212	108	4
BOEING 757-300	44	8	8	8	4
BOEING 767-200/200ER	2	2	2	-	-
BOEING 767-300/300ER	2,264	1,236	1,480	1,496	1,510
BOEING 767-400	18	22	26	30	40
BOEING 777-200/200LR	2	4	28	42	60
BOEING 777-300ER	-	310	-	474	754
BOEING 787-1000 DREAMLINER	-	670	718	256	-
BOEING 787-800 DREAMLINER	910	556	1,820	2,046	2,020
BOEING737-900	1,232	10	12	16	26
BOMBARDIER CS100	-	168	6,414	13,396	14,208
CANADAIR RJ-200ER /RJ-440	3,456	210	-	-	-
CANADAIR RJ-700	3,700	2	2	2	-
CANADAIR RJ-900	5,636	2,594	2,142	210	30
DEHAVILLAND DHC8-400 DASH-8	3,306	3,136	3,098	1,660	250
EMBRAER 170	40	-	-	-	-
EMBRAER 190	12	20	26	30	34
EMBRAER-175	2,436	19,766	21,356	20,888	17,718
MCDONNELL DOUGL DC9 SUPER 80/MD81/2/3/8	3,274	12	8	-	-
MCDONNELL DOUGLAS DC-10-10	74	-	-	-	-
MCDONNELL DOUGLAS DC-10-30	56	-	-	-	-
MCDONNELL DOUGLAS MD-11	6	10	10	-	-
MCDONNELL DOUGLAS MD80	2	-	-	-	-
MCDONNELL DOUGLAS MD-90	938	1,242	-	-	-
OTHER	260	246	266	276	292
Subtotal Commercial	94,798	127,844	143,858	158,230	185,884

Table L.1 – Summary of Fleet Mix Forecast (2 of 3)

Aircraft Types	Aircraft Operations 2015 (a)	2022	2027	2032	2037
General Aviation					
Beechcraft Bonanza 33	171	160	155	145	130
Beechcraft Bonanza 35	745	700	550	400	270
Beechcraft Bonanza 36	946	900	850	800	750
Bellanca Viking	105	110	115	125	140
Cessna 172	1,124	1,000	900	800	720
Cessna 182 SEPV	642	600	600	600	600
Cessna 206	345	340	340	340	340
Cessna 210 SEPV	619	550	500	450	413
Cirrus SR22	877	950	1,060	1,200	1,400
Extra EA-300	127	140	140	150	160
Grumman AA-5 Tiger	190	170	150	120	100
Mooney Mark 20	298	280	260	240	220
Piper Cherokee	147	140	140	140	140
Piper Cherokee Warior	126	120	120	120	120
Piper Malibu	117	110	100	90	80
Piper Saratoga	187	180	180	180	180
Other Single Engine Piston	1,332	1,270	1,213	1,161	1,134
Beechcraft 55 Baron	107	100	80	75	70
Beechcraft 58 Baron	392	418	420	472	530
Cessna 310	106	100	80	75	70
Cessna 340	137	130	105	100	90
Cessna Golden Eagle 421	146	135	115	110	105
Other Multi Engine Piston	423	420	382	396	412
Beechcraft 200 Super King Air	240	240	240	240	240
Beechcraft King Air 90	154	155	155	155	155
Beechcraft Super King Air 300	132	130	125	120	115
Pilatus PC 12	820	864	870	1,000	1,343
Piper Cheyenne 2	100	100	100	100	100
Raytheon Beechcraft King Air 350	447	470	477	600	750
Other Turboprop	399	413	415	467	570
Beechcraft Beechjet 400	347	350	350	350	350
Bombardier Challenger 300	1,285	1,800	2,200	2,700	3,250
Bombardier Challenger 350	267	400	500	608	750
Bombardier Global 5000	195	300	400	500	620
Bombardier Global Express	668	1,000	1,250	1,600	2,000
Canadair Bombardier CL600/610	788	800	800	800	800
Cessna Citation 510 Mustang	152	250	350	450	560
Cessna Citation 550	153	150	150	150	150
Cessna Citation 560 Ultra	502	500	500	500	500
Cessna Citation 560XL Excel	1,822	2,400	2,900	3,400	3,950
Cessna Citation 680 Sovereign	656	900	1,200	1,550	1,950
Cessna Citation 750	1,412	2,238	2,663	3,100	3,650
Cessna Citation CJ1	420	400	350	300	250
Cessna Citation CJ2	156	150	150	150	150
Cessna Citation CJ3	393	400	400	400	400
Dassault Falcon 2000	1,101	1,500	1,900	2,350	2,850
Dassault Falcon 50	174	150	125	100	75
Dassault Falcon 7X	277	350	450	550	660
Dassault Falcon 900	623	600	600	600	600
Embraer EMB-145XR	2,592	2,600	2,600	2,600	2,600
Embraer ERJ-145	110	100	100	100	100
Embraer Phenom 100	1,055	1,050	1,050	1,050	1,050
Embraer Phenom 300	697	950	1,300	1,700	2,150
Gulfstream G280	107	150	200	260	330
Gulfstream IV	1,285	1,300	1,300	1,300	1,300
Gulfstream V	1,373	1,800	2,200	2,650	3,150
Gulfstream VI	378	550	700	900	1,114

Table L.1 – Summary of Fleet Mix Forecast (3 of 3)

	Aircraft Operations				
Aircraft Types	**2015 (a)**	**2022**	**2027**	**2032**	**2037**
IAI 1126 Astra Galaxy/Gulfstream 200	372	370	370	370	370
IAI Gulfstream G150 (Astra)	112	150	200	260	330
Learjet 35	166	150	130	110	90
Learjet 45	204	300	400	560	750
Learjet 60	257	260	260	260	260
Raytheon Hawker 800	579	580	580	580	580
Other Jet	1,055	1,273	1,461	1,676	1,923
Helicopter	309	383	390	458	524
GA Subtotal	33,743	37,999	41,416	45,963	51,583
Military					
BOEING 737-700/700LR	50	50	50	50	50
Other Military	226	200	200	200	200
Military Subtotal	276	250	250	250	250
Design Group V Subtotal	948	3,216	4,532	5,218	6,098
Design Group IV Subtotal	3,432	1,790	1,878	1,642	1,558
Design Group III Subtotal	89,316	126,032	141,732	156,744	184,820
Design Group I and II Subtotal	35,121	35,055	37,382	40,839	45,241
Total	128,817	166,093	185,524	204,443	237,717

(a) 2015 for commercial and 2016 for GA and military.

Sources: SJC ANOMS data, Table H.6, and HNTB analysis.

APPENDIX M: COMPARISON WITH TAF

Table M.1 provides a comparison of the current forecast with the FAA's TAF. FAA Guidance on the review and approval of aviation forecasts states that forecasts for total enplanements and total operations are "considered consistent with the TAF if they meet the following criterion: Forecasts differ by less than 10 percent in the 5-year forecast period, and 15 percent in the 10-year forecast period."

The passenger enplanement forecast comparison indicates that the current forecast is well within the TAF during the first ten years. In the long-term, 2032 and 2037, the master plan enplanement forecasts begin to diverge significantly from the TAF, because of projected traffic diversion from SFO and OAK. The TAF assumes all Bay Area airports are unconstrained and thus assumes no diversion.

The master plan and TAF forecasts for commercial aircraft operations deviate by about 15 percent during the first fifteen years because of the difference in base year numbers. The growth rates in the master plan forecast (2.8 percent) and the TAF (2.5 percent) are very similar, indicating that if there were no difference in base year numbers the forecasts would be very similar.

The master plan total operations forecasts lag the TAF initially because of the difference in base year counts but the difference diminishes by the end of the forecast period. The additional operations generated by diverted passenger traffic from SFO and OAK result in a faster total operations growth for the master plan (2.6 percent) compared to the TAF (2.1 percent). Also, the master plan general aviation forecast is more aggressive than the TAF, reflecting the master plan focus on individual aircraft categories, and the Silicon Valley business base which drives the rapidly growing jet fleet.

Table M.1 – Comparison of SJC Forecast with FAA TAF

Year	SJC Forecast (a)	TAF (b)	Percent Difference
	Passenger Enplanements		
2015	4,885,690	4,753,565	2.8%
2016	5,377,433	5,168,324	4.0%
2022	6,854,325	6,846,898	0.1%
2027	7,847,623	7,593,069	3.4%
2032	9,053,079	8,425,445	7.4%
2037	11,266,037	9,325,856	20.8%
	Compounded Annual Growth Rate		
2016-2037	3.6%	2.9%	
	Commercial Aircraft Operations (Air Carrier and Air Taxi)		
2015	94,798	113,221	-16.3%
2016	104,896	122,358	-14.3%
2022	127,844	155,875	-18.0%
2027	143,858	170,579	-15.7%
2032	158,230	186,402	-15.1%
2037	185,884	203,639	-8.7%
	Compounded Annual Growth Rate		
2016-2037	2.8%	2.5%	
	Total Operations		
2015	129,021	147,370	-12.5%
2016	138,915	156,461	-11.2%
2022	166,093	190,557	-12.8%
2027	185,524	205,769	-9.8%
2032	204,443	222,109	-8.0%
2037	237,717	239,871	-0.9%
	Compounded Annual Growth Rate		
2016-2037	2.6%	2.1%	

(a) Tables 5 and 9.
(b) FAA 2016 Terminal Area Forecast for SJC.

Sources: As noted and HNTB analysis.