San Antonio International Airport Strategic Development Plan

2021 AIRPORT MASTER PLAN

CHAPTER 3 – AVIATION DEMAND FORECASTS

JUNE 2019

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3 AVIATION DEMAND FORECASTS

Aviation activity forecasts serve as the basis for determining future airport capacity needs and formulating facility development plans. This chapter presents unconstrained forecasts for a 20-year period for the different types of aviation activity at San Antonio International Airport (SAT or the Airport): commercial passenger service, commercial air cargo service, and noncommercial aviation activity (general aviation and military). The chapter documents the forecast development process, which involves the following tasks:

- Assessment of socio-economic trends in the Airport's air service area
- Analysis of historical trends in aviation activity at the Airport
- Assessment of air service development initiatives
- Forecast development
- Risk assessment

Except where otherwise noted, all activity data is presented in terms of the CoSA's fiscal year (FY), which begins on October 1st and ends on September 30th each year.

ADDENDUM, April 2022

This forecast (enplanements, operations, based aircraft, design aircraft and methodology) was approved by the Federal Aviation Administration (FAA) in October 2018 by reviewing a draft of the forecast dated September 2018. Since the approval, *Section 3.6 Forecast Risk Factors* was added at the end of the chapter in June 2019, at the time the forecast documentation was finalized.

Since June 2019, two adjustments have been made to the forecasts with FAA approval: 1) inclusion of air taxi aircraft operations and 2) an adjustment in the forecast to account for the impact of the COVID-19 pandemic on aviation demand. These two adjustments are summarized in the paragraphs below

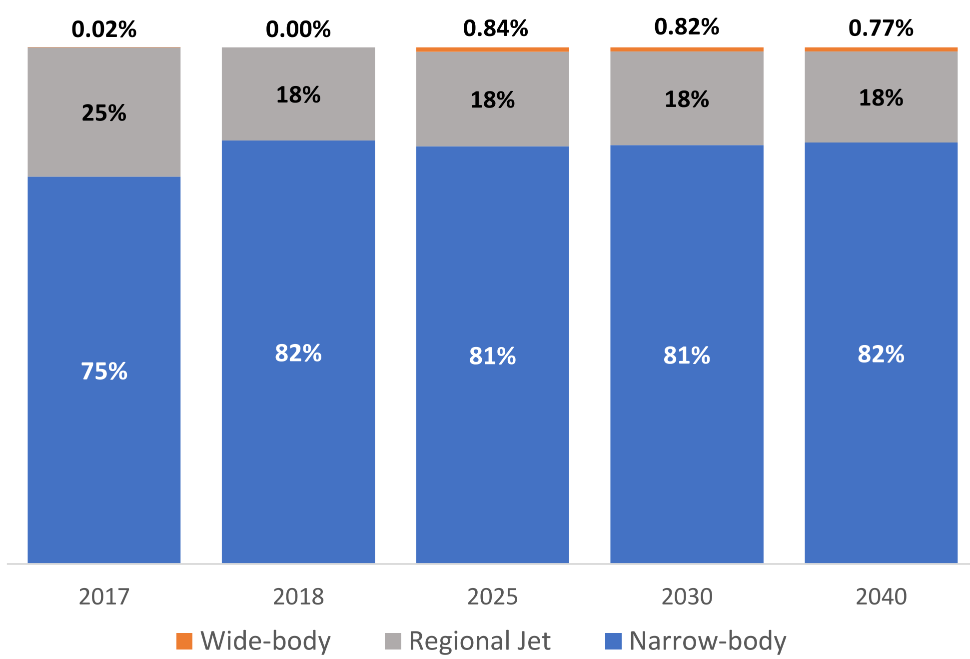
- **Air Taxi Operations** – When the forecast was submitted to the FAA for approval in September 2018, air taxi aircraft operations were inadvertently omitted. Air taxi operations consist of aircraft with a seating capacity of up to 60 seats or a maximum payload capacity of 18,000 pounds, carrying passengers or cargo for hire or compensation. Air taxi aircraft operations are projected to increase from approximately 17,000 in 2018 to 22,600 in 2038, reflecting a compounded annual growth rae of 1.4 percent during that period. Air taxi aircraft operations' share of total aircraft operations is approximately 10 percent to 11 percent throughout the forecast period. This correction did not have an significant effect on the demand/capacity of the ruunways. The table below provides the details of the adjustment to aircraft operations to reflect the inclusion of air taxi operations.

	Actual	Estimate	Forecast			Compound Annual Growth Rate			
	2017	2018	2023	2028	2038	2018-2023	2023-2028	2028-2038	2018-2038
Commercial Aircraft (Passenger & Cargo)	92,594	96,725	108,614	116,416	131,111	2.3%	1.4%	1.2%	1.5%
Air Taxi Operations	16,470	17,165	18,721	20,065	22,598	1.7%	1.4%	1.2%	1.4%
Noncommercial Aircraft Operations	51,478	52,729	53,325	53,939	55,223	0.2%	0.2%	0.2%	0.2%
Total Aircraft Operations	160,542	166,619	180,660	190,420	208,932	1.6%	1.1%	0.9%	1.1%

The FAA approved this adjustment during the development of the Noise Exposure Map (NEM) forecast development in November 2020.

- **COVID-19-Pandemic** – As a result of the deep decline in aviation demand due to the COVID-19 pandemic an adjustment was made to the forecast to reflect the decline of traffic and the recovery of demand through late 2021. In August 2021, a letter was provided to the FAA to request approval of the methodology used for the adjustment to the aviation demand forecast. To account for the impact of the COVID-19 pandemic on the aviation demand forecasts, projected traffic was shifted two years. For example, base case enplanements for FY 2023 were shifted to FY 2025. In addition to the shift in the forecast, there was also an adjustment to the projected aircraft fleet mix to reflect the earlier than expected retirement of certain types of aircraft, such as the McDonnell Douglas 88. The table below provides a summary of the elements of the aviation demand forecasts and the graph below presents the projected passenger aircraft (commercial) fleet mix (share of total operations) as a result of the shift and adjustments due to the COVID-19 pandemic. The background regarding the methodology for the forecast adjustment can be found in **Appendix 3A**.

	Actual	Estimate	Forecast			Compound Annual Growth Rate			
	2017	2018	2025	2030	2040	2018-2025	2025-2030	2030-2040	2018-2040
Enplanements (1,000s)	4,432	4,873	5,731	6,283	7,234	2.3%	1.9%	1.4%	1.8%
Commercial Aircraft & Air Taxi Operations	109,064	113,890	127,335	136,481	153,710	1.6%	1.4%	1.2%	1.4%
Noncommercial Aircraft Operations	51,478	52,729	53,325	53,939	55,223	0.2%	0.2%	0.2%	0.2%
Based Aircraft	218	221	234	248	279	0.8%	1.2%	1.2%	1.1%



Note: All analyses in subsequent chapters of the Master Plan use the adjusted forecast described above.

END OF ADDENDUM, April 2022

3.1 SOCIOECONOMIC TRENDS

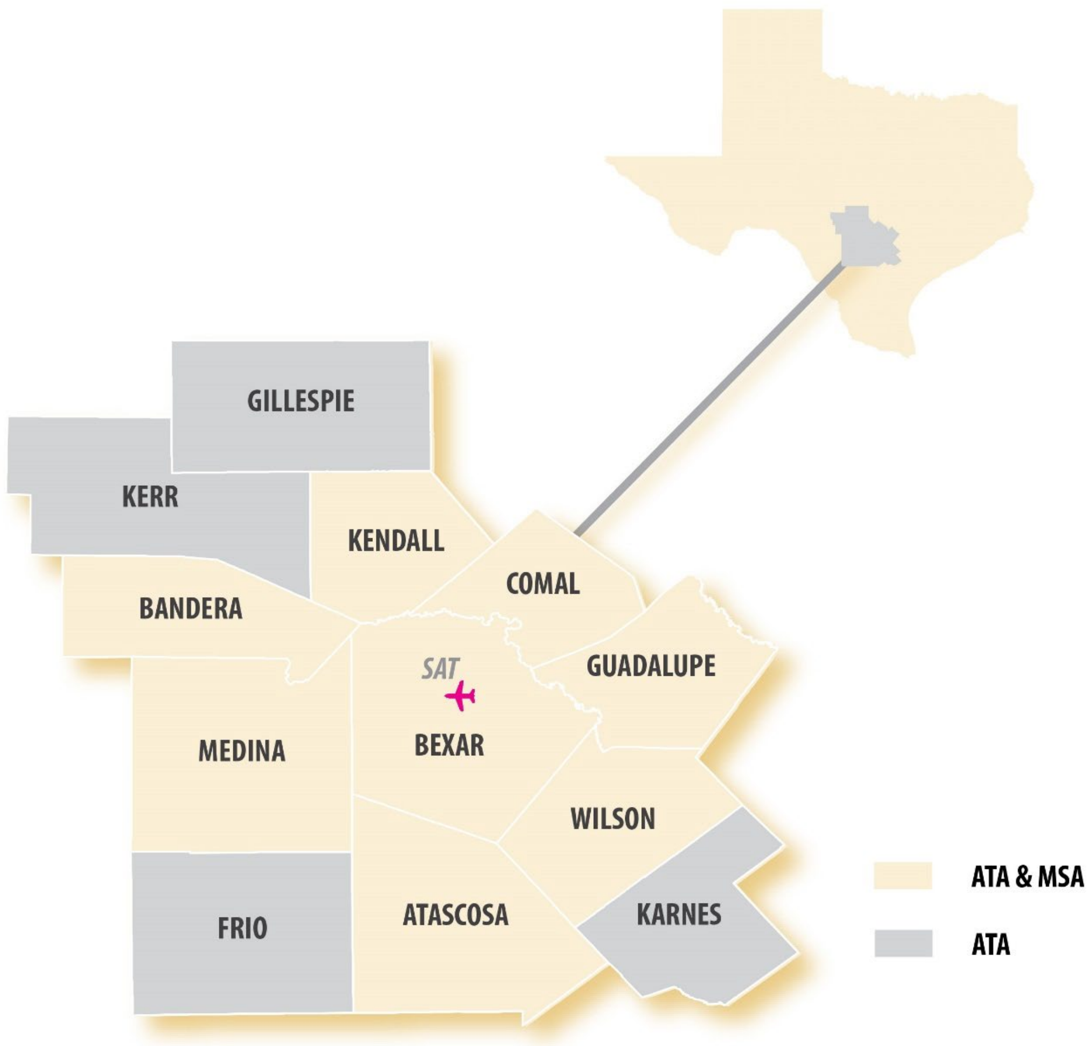
Socioeconomic trends are strong indicators for assessing the demand for air travel in the demographic area served by SAT. It is important to investigate socioeconomic trends not only for the SAT Air Trade Area (The Alamo Area or ATA), but also the entire State of Texas and the United States for a holistic perspective on the potential impacts to air travel to and from SAT. Socioeconomic trends tell a story of the SAT Air Trade Area residents' proclivity for air travel, as well as the likelihood for visitors from around the country and internationally to select SAT as a travel destination. This section will provide context to what trends may drive demand for air travel to and from SAT, while also examining the impact of being located in a region with a strong presence of major airports.

3.1.1 AIR TRADE AREA

For the purposes of the analysis, the SAT Air Trade Area is considered to be the Alamo Area, which consists of 12 counties: Atascosa County, Bandera County, Bexar County, Comal County, Frio County, Gillespie County, Guadalupe County, Karnes County, Kendall County, Kerr County, Medina County, and Wilson County.

Note that the San Antonio-New Braunfels MSA consists of eight of the 12 counties that comprise the Alamo Area, excluding Frio County, Gillespie County, Karnes County, and Kerr County. In the case that data was not available at the county level, data for the San Antonio-New Braunfels MSA (which represents 94 percent of the Alamo Area by population) was presented as a proxy. **Figure 3.1-1** presents the geographic location of the Air Trade Area.

Figure 3.1-1: Air Trade Area



Source: WSP USA, 2018.

The Alamo Area receives over $200 million in state and federal funding each year to support transportation planning. The AAMPO is responsible for managing these funds to enable cooperative, continuous, and comprehensive transportation planning in the Alamo Area.

SAT is located in the CoSA, within Bexar County. Interstate 10 (I-10) connects San Antonio to the city of Boerne (northwest) in Kendall County; there is significant development underway throughout this corridor. Interstate 35 (I-35) connects San Antonio to Austin, as well as the city of New Braunfels in Comal County; this corridor is also undergoing notable development.

San Antonio is known as “Military City USA,” home to seven military installations, three air force installations and four army installations. Joint Base San Antonio includes three separate military installations, two air force bases (Lackland Air Force Base and Randolph Air Force Base) and one Army installation (Fort Sam Houston). The remaining installations include Brooks City Air Force Base, Camp Bullis, Camp Stanley, and Martindale Army Airfield. In addition to its strong military history, San Antonio’s economy benefits from a rich tourism industry. In 2015, the United Nations Educational Scientific and Cultural Organization (UNESCO) declared five of San Antonio's historic mission sites as World Heritage Sites. The Alamo is the most popular and well-known of the five missions.

According to the U.S. Department of Transportation (U.S. DOT) Bureau of Transportation Statistics (BTS) data, in calendar year (CY) 2017, SAT was the 6th busiest airport in Texas based on origin-and-destination (O&D) enplanements. The top ten busiest airports in Texas for CY 2017 based on O&D enplanements are summarized in **Table 3.1-1**, including their FY 2017 total aircraft operations, FY 2017 enplanements, and proximity to SAT.

Table 3.1-1: Texas Top Ten Airports (2017)

AIRPORT	CY 2017 ORIGIN & DESTINATION ENPLANEMENTS	FY 2017 AIRCRAFT OPERATIONS	FY 2017 ENPLANEMENTS	DISTANCE FROM SAT (MILES)
Dallas/Ft. Worth International	12,403,770	655,525	31, 567,091	291
George Bush Intercontinental	7,161,330	452,158	19,808,985	219
Austin-Bergstrom International	5,927,750	197,962	6,602,643	77
Dallas Love Field	5,213,450	225,754	7,574,439	280
William P. Hobby	4,214,940	201,935	6,496,125	209
San Antonio International	3,823,890	160,542	4,300,059	N/A
El Paso International	1,319,660	104,369	1,440,016	544
Midland International	493,990	60,851	495,255	333
Lubbock International	422,610	75,801	453,383	387
McAllen-Miller International	296,490	56,609	341,516	247

Sources: U.S. DOT BTS (O&D), 2017 Federal Aviation Administration Terminal Area Forecast (aircraft operations and enplanements), Google Maps; Compiled by WSP.

SAT is located roughly 77 miles southwest of Austin-Bergstrom International Airport (AUS), and roughly 220 miles west of George Bush Intercontinental Airport in Houston (IAH). Given IAH's status as a major hub for United Airlines and nonstop flights to approximately 115 domestic and 60 international destinations, it is not surprising that IAH is responsible for much of SAT's leakage of passengers to other airports. AUS is responsible for SAT leakage as well, likely due to its proximity and other factors related to the competitiveness of air fares, which will be discussed later in this chapter.

3.1.2 POPULATION

Population growth trends are an indicator of future economic development as well as future travel demand. An air trade area with strong projected population growth may indicate additional future demand from the growing resident population, as well as increasing popularity of a location resulting in additional visits. The SAT Air Trade Area has experienced significant natural growth in addition to strong domestic migration in recent years.

CURRENT POPULATION

According to the 2017 population estimates from the U.S. Census Bureau, the CoSA added over 24,200 people between July 2016 and July 2017, more than any other city in the U.S. As of July 2017, it is the second most populous city in Texas (behind Houston) and the seventh largest in the U.S. at just over 1.5 million people. The CoSA is not the only jurisdiction driving growth in the SAT Air Trade Area, as both Comal County and Kendall County ranked as the first (5.2 percent growth) and third (4.9 percent growth) fastest growing counties in Texas, respectively, and the second and fifth in the nation between July 2016 and July 2017. The City of New Braunfels was the nation's second fastest growing city, a driver for growth in Comal County. The San Antonio-New Braunfels MSA ranks 24th among all MSAs in the U.S., with the Dallas-Ft. Worth-Arlington MSA (7.4 million population) and the Houston-the Woodlands-Sugar Land MSA (6.9 million) ranking fourth and fifth, respectively.

The CoSA is located in Bexar County, the fifth largest county in Texas representing approximately 7 percent of the state's population. The SAT Air Trade Area collectively represents approximately 9 percent of the state's 28 million residents as of July 2017. **Table 3.1-2** provides mid-year population estimates and respective state rankings for each of the twelve counties in the SAT Air Trade Area and **Figure 3.1-2** graphically presents the distribution of the population within the SAT Air Trade Area.

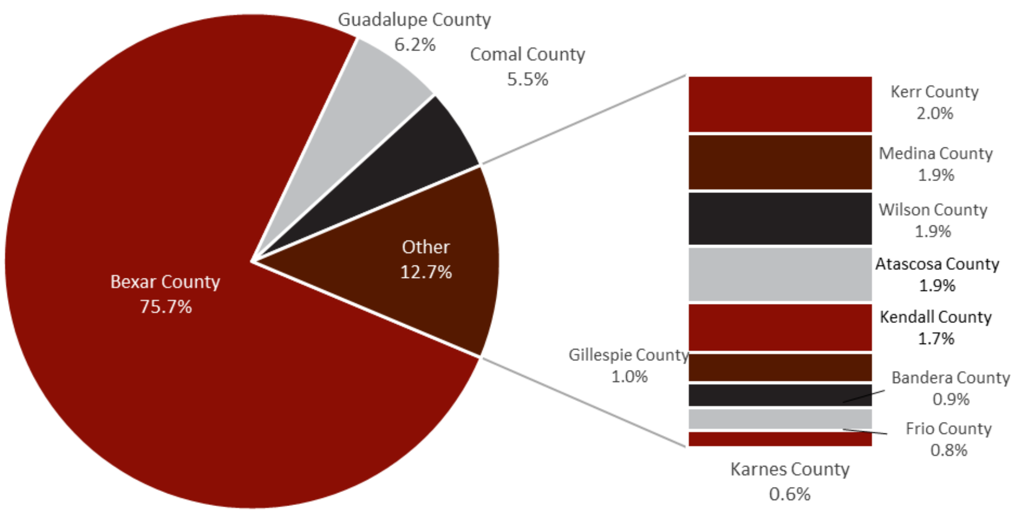
Table 3.1-2: Population of Texas and the SAT Air Trade Area

GEOGRAPHY	POPULATION	SHARE OF STATE POPULATION	STATE RANKING
Texas State Total	**28,304,596**	**100.0%**	**N/A**
Total SAT Air Trade Area	2,587,127	9.1%	N/A
Bexar County	1,958,578	6.9%	5
Guadalupe County	159,659	0.6%	29
Comal County	141,009	0.5%	31
Kerr County	51,720	0.2%	64
Medina County	50,066	0.2%	66
Wilson County	49,304	0.2%	68
Atascosa County	48,981	0.2%	71
Kendall County	44,026	0.2%	75
Gillespie County	26,646	0.1%	101
Bandera County	22,351	0.1%	111
Frio County	19,600	0.1%	126
Karnes County	15,187	0.1%	141

Note: SAT – San Antonio International Airport

Source: US Census Bureau, mid-year population estimates, July 1, 2017; Compiled by WSP.

Figure 3.1-2: Population Distribution of the SAT Air Trade Area



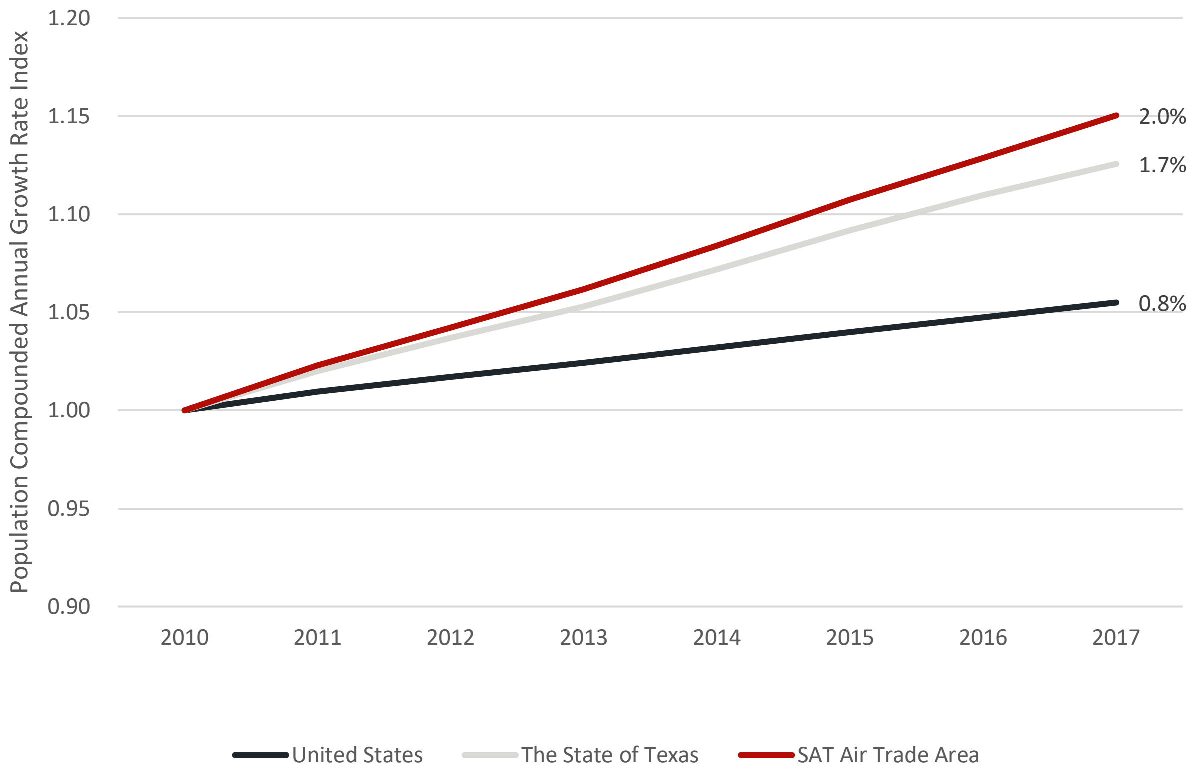
Note: SAT – San Antonio International Airport

Source: US Census Bureau mid-year population estimates, July 1, 2017; Compiled by WSP.

POPULATION GROWTH TRENDS

In 2014, the decrease in oil prices slowed economic growth across the State of Texas. Additionally, both natural growth and net migration decreased between 2015 and 2016, primarily in the Houston-The Woodlands-Sugar Land MSA. However, Texas did not observe a notable reduction to its population growth and the SAT Air Trade Area observed a more rapid population growth rate than the state as a whole (**Figure 3.1-3**). The compounded annual growth rate (CAGR) between the 2010 and 2017 mid-year population estimates were 0.8 percent, 1.7 percent, and 2.0 percent for the US, Texas, and the SAT Air Trade Area, respectively.

Figure 3.1-3: Population Trends for the US, Texas, and SAT Air Trade Area

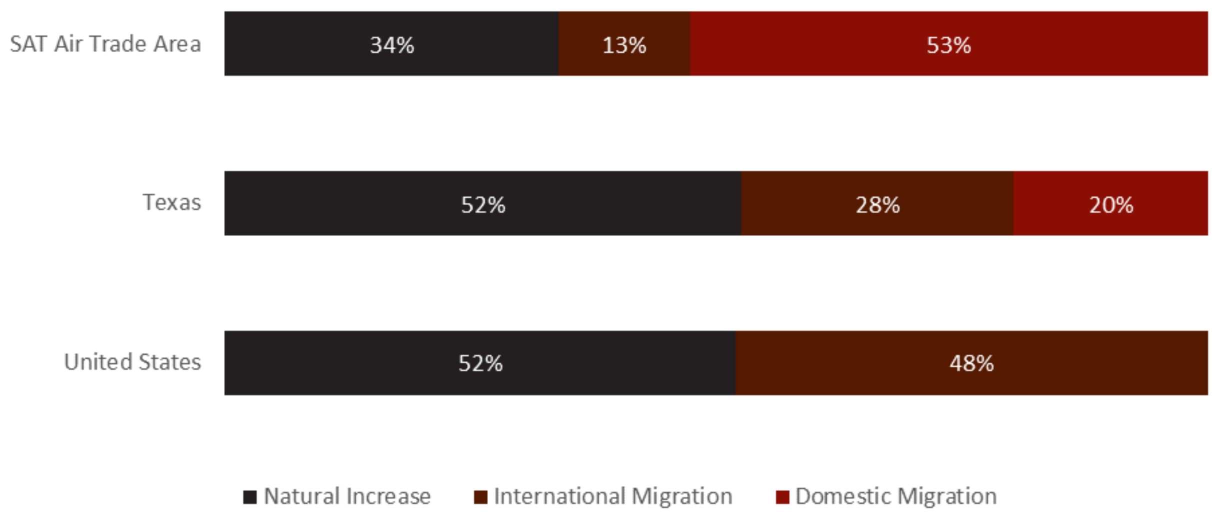


Note: SAT – San Antonio International Airport

Source: US Census Bureau mid-year population estimates, July 1, 2017; Compiled by WSP.

Population growth observed in the SAT Air Trade Area is attributed to either natural increase (births net of deaths) or net migration (domestic and international). **Figure 3.1-4** shows that net migration was a greater driver for the total population increase between July 2016 and July 2017 than what was observed statewide and nationally. International and domestic migration to the SAT Air Trade Area was collectively responsible for 66 percent of the population increase, while net migration was responsible for 48 percent of the population increase for both Texas and the U.S. Of the contribution due to net migration to the SAT Air Trade Area, domestic migration was more prevalent than international migration, as the SAT Air Trade Area is observing increased migration from other counties in Texas as well as other states. According to the State demographer from the University of Texas at San Antonio (UTSA), the SAT Air Trade Area receives the majority of non-Texas domestic migrants from Florida, New York, Illinois, and Louisiana, largely driven by employment opportunities.

Figure 3.1-4: Cause of Population Growth for the U.S., Texas, and SAT Air Trade Area



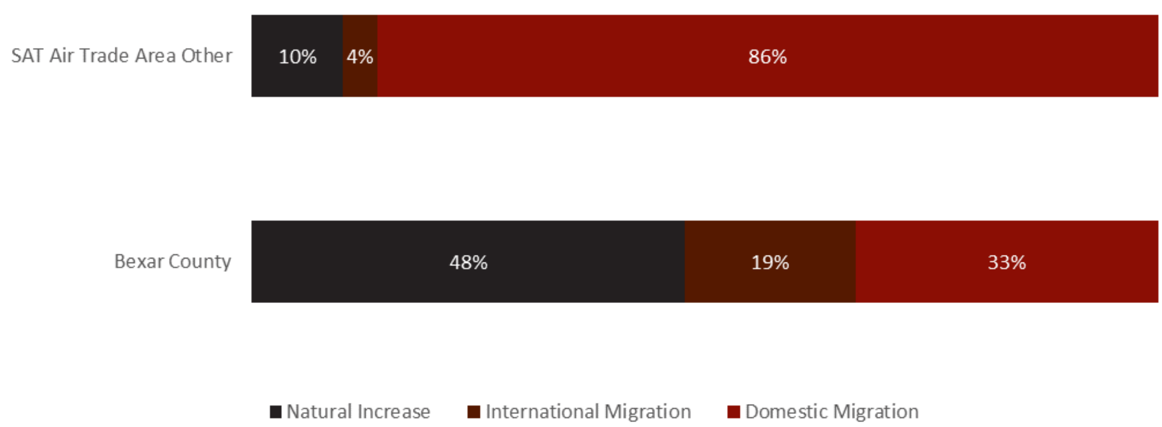
Note: SAT – San Antonio International Airport

Source: US Census Bureau, Estimates of the Components of Resident Population Change: April 1, 2010 to July 1, 2017; Compiled by WSP.

As the home to the CoSA and SAT, Bexar County stands out from the remaining counties of the SAT Air Trade Area. Bexar county's growth portfolio is more in line with trends observed statewide and nationally, with 52 percent of growth attributed to net migration and 48 percent to natural increase (**Figure 3.1-5**). The remaining counties in the SAT Air Trade Area attributed 90 percent of growth to net migration and only 10 percent due to natural increase. Across Texas's other urban centers, such as Dallas / Fort Worth, Houston, and Austin, growth is driven by natural increase, while growth in suburban regions is driven by net migration. This trend is an indicator of development in the SAT Air Trade Area's small urban and rural counties such as Kendall and Comal Counties. Employment opportunities are expanding in the area as a whole, rather than being concentrated in San Antonio or Bexar County, which may prove to be a strong driver for air travel demand in the SAT Air Trade Area in future years.

As baby boomers are replaced by a younger generation in the CoSA, note that another driver for the prevalence of natural increase in Bexar County's population is attributed to high crude birth rates relative to death rates. **Figure 3.1-6** shows a larger discrepancy between birth and death rates in Bexar County than what was observed in the remaining counties in the SAT Air Trade Area. However, the natural increase trends observed in the remaining counties of the SAT Air Trade Area are still in line with those observed across the U.S.

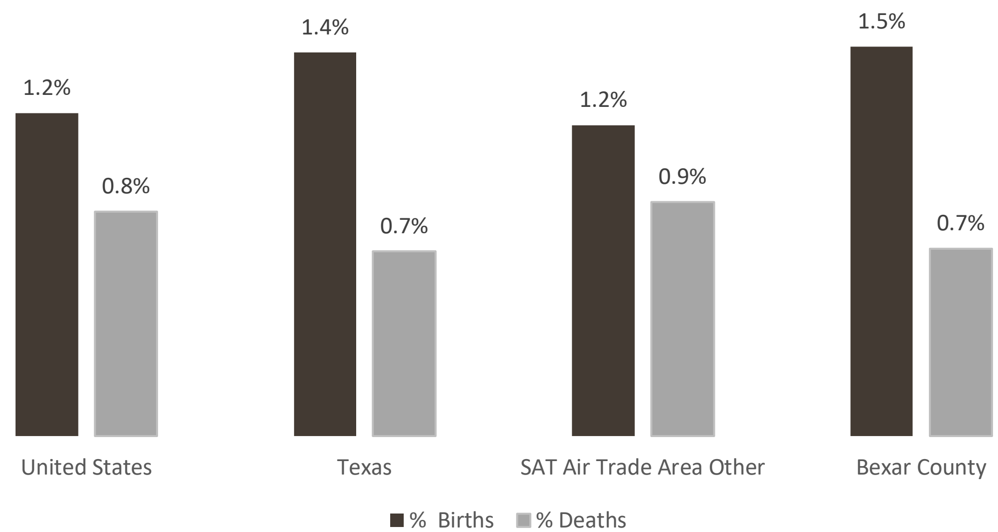
Figure 3.1-5: Population Growth Cause Comparison Between Bexar County and the Remaining Counties of the SAT Air Trade Area



Note: SAT – San Antonio International Airport

Source: US Census Bureau, Estimates of the Components of Resident Population Change: April 1, 2010 to July 1, 2017; Compiled by WSP.

Figure 3.1-6: Birth and Death Rates for US, Texas, Bexar County, and the Remaining Counties of the SAT Air Trade Area



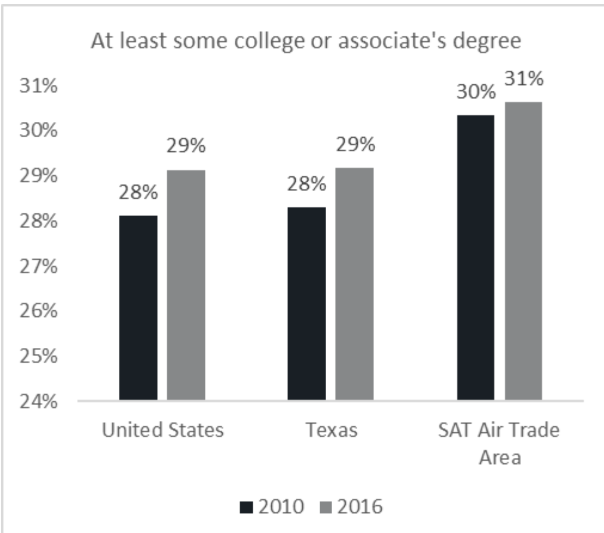
Note: SAT – San Antonio International Airport

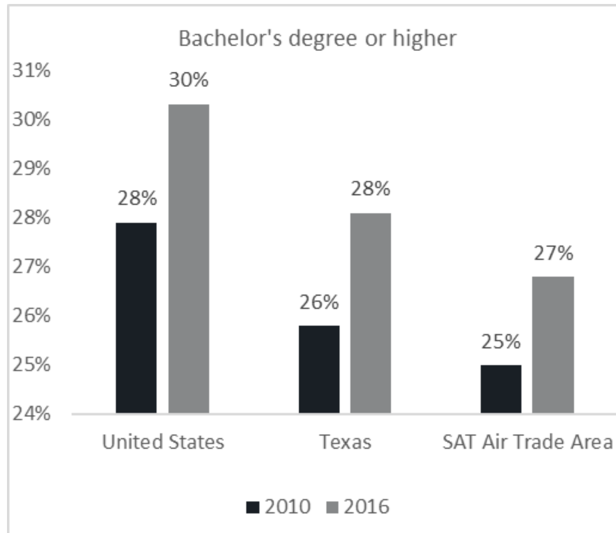
Source: US Census Bureau, Estimates of the Components of Resident Population Change: April 1, 2010 to July 1, 2017; Compiled by WSP.

3.1.3 EDUCATIONAL ATTAINMENT

Historically, educational attainment levels for residents of the SAT Air Trade Area favored at least some college or associate's degree over a bachelor's degree or higher degree. **Figure 3.1-7** summarizes the levels of educational attainment in 2010 and 2016 for the SAT Air Trade area, Texas, and the U.S. for 2010 and 2016. Residents of the SAT Air Trade Area continue to exhibit a higher percentage of residents with at least some college or associate's degree relative to Texas and the U.S., and a lower percentage of residents with a bachelor's degree or higher relative to Texas and the US. Between 2010 and 2016 the SAT Air Trade Area increase in educational attainment for both categories was in line with the percentage increases for both the State of Texas and the U.S.

Figure 3.1-7: Educational Attainment for the Population 25 Years and Older for U.S., Texas, and the SAT Air Trade Area





Note: SAT – San Antonio International Airport

Sources: US Census Bureau, 2006-2010 American Community Survey; Compiled by WSP.

Given the educational attainment as described above, the CoSA's Economic Development Department (EDD) is focused on supporting an educational pathway that ends with a 4-year degree for current and future resident students. However, cognizant of the educational attainment and skillsets of the current workforce, EDD is focused on developing San Antonio's employment opportunities in four focus industries: cyber security and IT, healthcare and biosciences, manufacturing and aerospace, and new energy. These four industries were selected primarily because they generally pay salaries above the county median and often require no more than a certificate or associate's degree, but not necessarily a bachelor's degree.

3.1.4 THE GREAT RECESSION

The U.S. experienced an economic recession between December 2007 and June 2009. This economic recession became known as the Great Recession as recovery from the economic downturn was much slower than previous recessions. Based on the U.S. Federal Reserve Economic Data (FRED), many key economic indicators did not reach pre-Great Recession levels until late 2012 through mid-2014. For instance, real gross domestic product (GDP) per capita and nonfarm employment did not reach pre-Great Recession levels until the fourth quarter of 2013 and May 2014, respectively. Because of the Great Recession, U.S. aviation activity, which is closely tied to the nation's economic performance, also did not reach pre-Great Recession levels until the same time frame.

3.1.5 LABOR MARKET

A growing labor market leads to economic prosperity in an air service area, which may influence air travel demand. Higher levels of employment and potentially higher median incomes means that residents have more disposable income and are more likely to opt for air travel. Additionally, when a labor market expands to include an increased and diversified portfolio of industries, there is more drive for outside visitors to travel to the area for business reasons.

As previously discussed, the CoSA's EDD is targeting job development in four key industries: cyber security and IT, healthcare and biosciences, manufacturing and aerospace, and new energy. The benefit of these four industries is that they offer well-paying positions for which a certificate or associate's degree is often sufficient, catering to the current educational attainment trends of the SAT Air Trade Area's population. Additionally, these target industries not only provide well-paying jobs for current residents of the area, but also attract new employment from other states. These industries create connections between the SAT Air Trade Area and other strong economic centers such as the San Diego or Minneapolis (for biosciences) regions or Japan for manufacturing (e.g. Toyota plant located in San Antonio).

Table 3.1-3 provides a summary of San Antonio's largest employers, according to San Antonio's Economic Development Foundation (EDF) as of 2017.

TOTAL NONFARM EMPLOYMENT

Figure 3.1-8 demonstrates historical employment trends of the San Antonio-New Braunfels MSA (data was unavailable at the county level) as compared to the State of Texas and the U.S. Both pre- and post-recession. In 2008, both Texas and the MSA observed higher nonfarm employment than the U.S. The San Antonio-New Braunfels MSA also rebounded slightly faster than the Texas post-recession. The growth rate of total nonfarm employment in the MSA began to outpace that of the Texas once again in 2015 and has continued to grow faster than the state since. The CAGR from 2004 through 2017 for the MSA is 2.3 percent, 0.4 percent above that of the State of Texas over the same time horizon. The current performance of the MSA's total nonfarm employment reflects positively on its future economic outlook.

Figure 3.1-9 provides a comparison of the San Antonio-New Braunfels MSA's historical nonfarm employment trends relative to Texas's largest MSAs based on population. The Austin-Round Rock MSA has observed the strongest growth in nonfarm employment of the major Texas MSAs; however, the San Antonio-New Braunfels MSA's nonfarm employment growth is favorable compared with the Dallas-Fort Worth-Arlington MSA and Houston-The Woodlands-Sugar Land MSA. The San Antonio-New Braunfels MSA began to outpace the Houston-The Woodlands-Sugar Land MSA's growth rate in 2016.

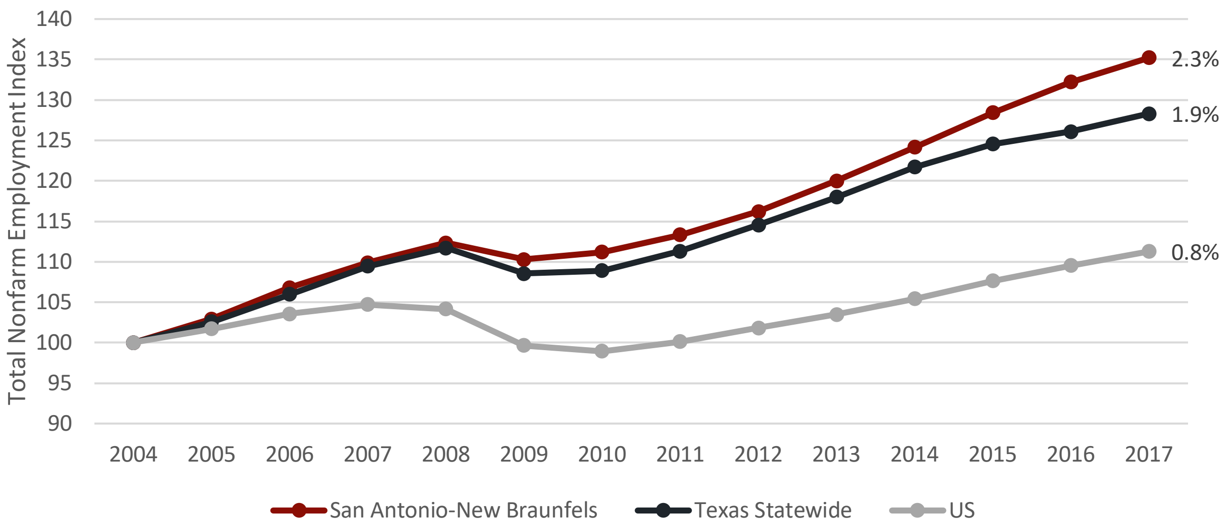
Table 3.1-3: San Antonio's Largest Employers (2017)

COMPANY*	SECTOR	NUMBER OF EMPLOYEES
Lackland Air Force Base	Military	37,000
Fort Sam Houston-U.S. Army	Military	32,000
H-E-B	Super Market Chain	20,000
USAA	Financial Services and Insurance	18,305
Randolph Air Force Base	Military	11,000
Methodist Healthcare System	Health Care Services	9,620
City of San Antonio	San Antonio	9,145
Baptist Health System	Health Care Services	6,383
Wells Fargo	Financial Services	5,073
Harland Clarke	Managed Services	5,000
JP Morgan Chase	Financial Services	5,000
Andeavor	Oil Refiner	5,000
Bill Miller BBQ	Restaurant Chain	4,500
AT&T	Phone, Wireless and Internet services	4,300
Valero Energy Corp.	Oil Refiner and Gasoline Mktg	4,000
Rackspace	IT Managed Hosting Solutions	3,540
CPS Energy	Utilities	3,125
Six Flags Fiesta Texas	Entertainment	3,000
Toyota Motor Manufacturing	Manufacturing	2,834
CitiBank	Financial	2,600
Southwest Research Institute	Applied Research	2,574
Frost Bank	Financial	2,242

Note: * Some of these companies may have been acquired or undergone name changes since 2017.

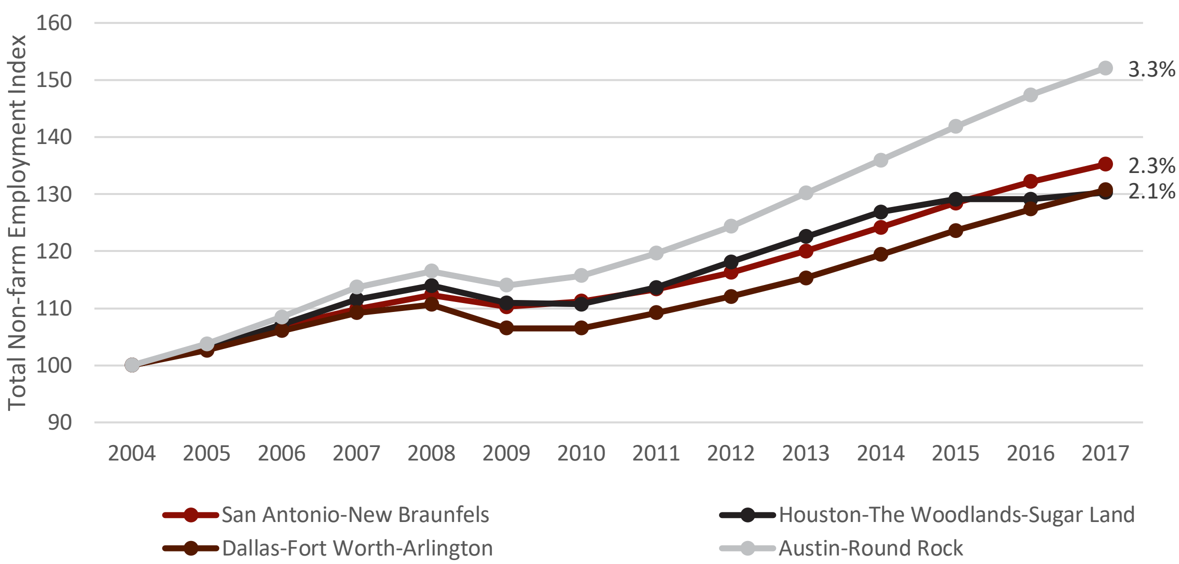
Source: San Antonio's Economic Development Foundation; Compiled by WSP.

Figure 3.1-8: Total Nonfarm Employment Index (2004 = 100), US, Texas, San Antonio-New Braunfels Metropolitan Statistical Areas



Source: U.S Bureau of Labor Statistics; Compiled by WSP.

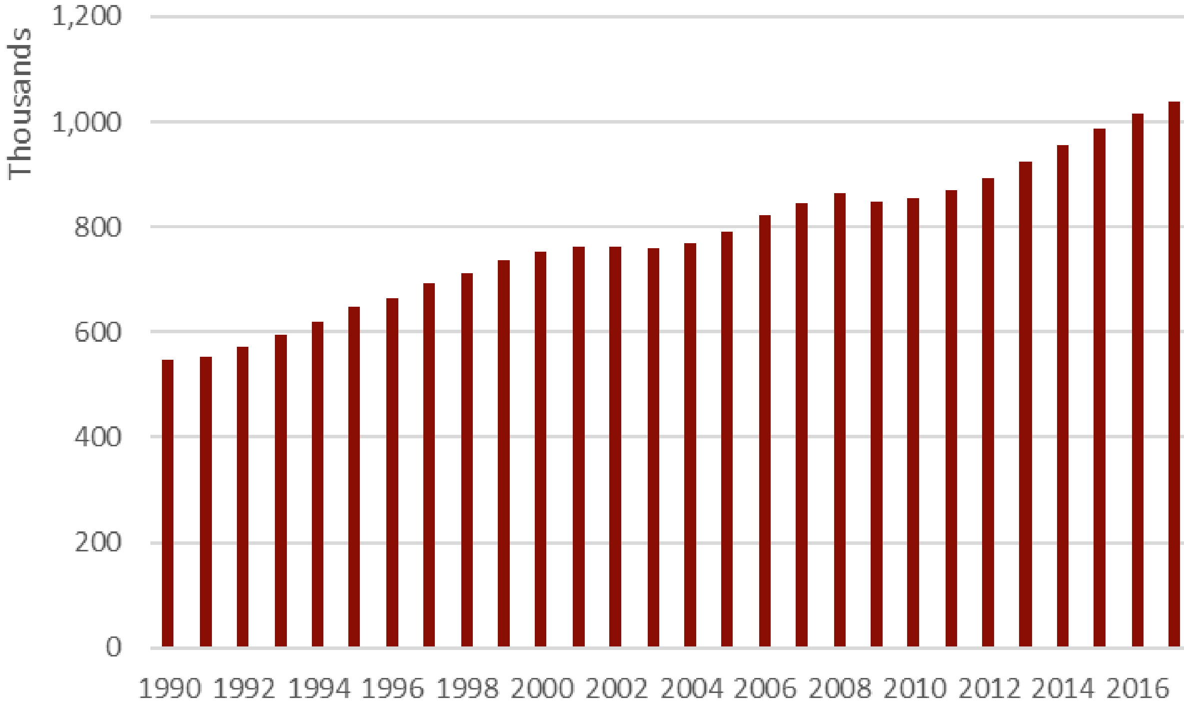
Figure 3.1-9: Total Nonfarm Employment Index (2004 = 100), Largest Texas Metropolitan Statistical Areas (Population)



Source: U.S. Bureau of Labor Statistics; Compiled by WSP.

Figure 3.1-10 provides total nonfarm employment from 1990 through 2017 for the San Antonio-New Braunfels MSA. Total nonfarm employment in the San Antonio-New Braunfels MSA has shown steady growth during this period. Nonfarm employment plateaued for a few years in the early 2000s, increased from 2005 through 2008, and decreased in 2009 post-recession. Growth in nonfarm employment has been steady since 2009, reaching increasing from approximately 0.8 million in 2009 to 1.0 million in 2017.

Figure 3.1-10: Total Nonfarm Employment San Antonio-New Braunfels Metropolitan Statistical Areas, 1990 – 2017



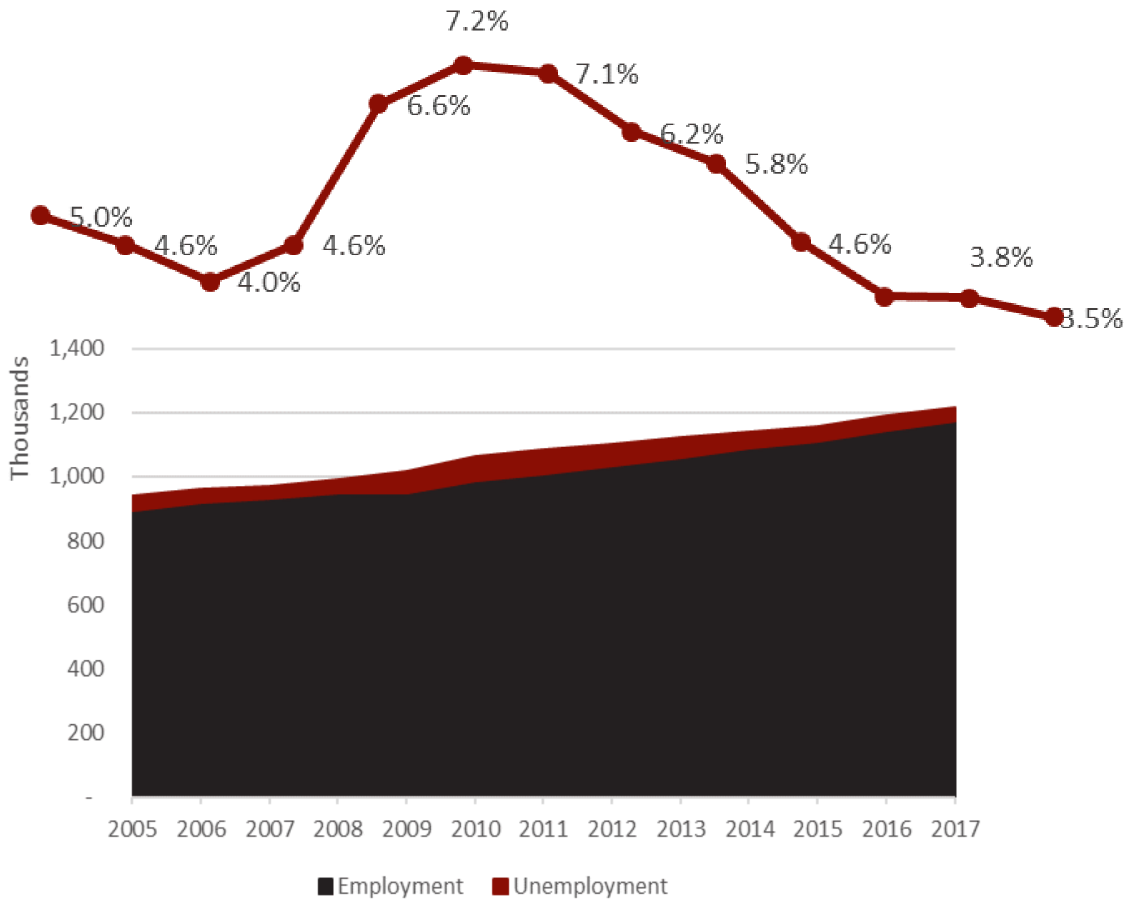
Source: U.S. Bureau of Labor Statistics; Compiled by WSP.

Labor Force Employment and Unemployment Trends

Figure 3.1-11 summarizes total civilian employment and unemployment from 2005 through 2017 collectively for all counties included in the SAT Air Trade Area. This data represents civilians, 16 years or older, who are currently employed or seeking employment. Unemployment in the SAT Air Trade Area was decreasing between 2005 and 2007, dropping from 5.0 percent to 4.0 percent, but ultimately rising in 2008 due to the Great Recession. Unemployment continued to rise post-recession and peaked in 2010 at 7.2 percent. From 2011 on, unemployment continued to decrease and fell to 3.5 percent in 2017, lower than the pre-recession unemployment rate.

Figure 3.1-12 shows historical labor force and historical employment growth relative to 2005 levels. The SAT Air Trade Area has observed consistently higher growth in both total labor force and employed labor force compared to Texas and the U.S. since 2005. Around 2010, the SAT Air Trade Area's labor force began to grow more quickly than Texas's labor force. The Great Recession had a more significant impact on national employed labor force than on the State of Texas. Post-recession, Texas's employed labor force rebounded faster than the national employed labor force, and the SAT Air Trade Area's employed labor force rebounded faster than that of both the state and the nation. As of 2017, the SAT Air Trade Area's labor force and employed labor force continue to grow rapidly.

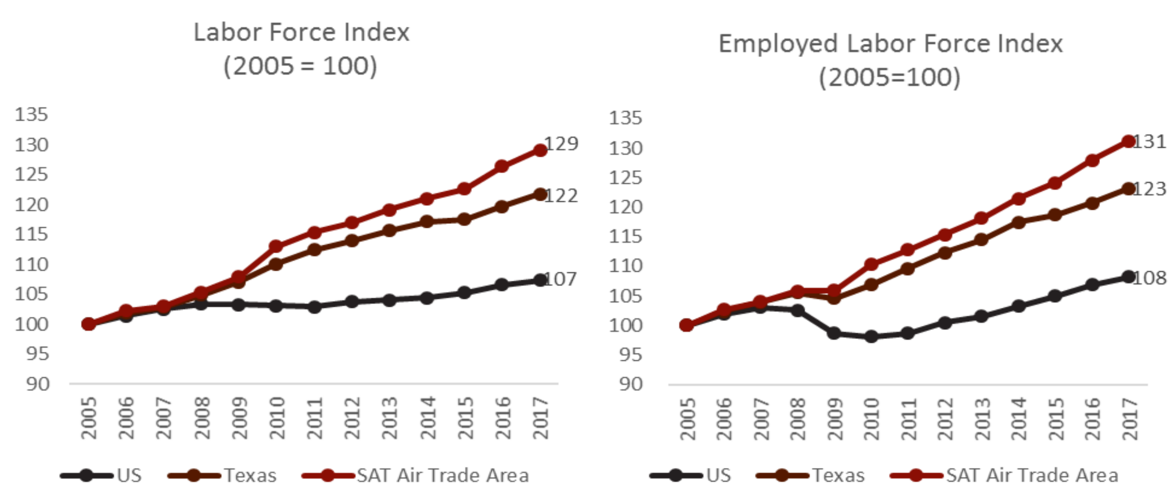
Figure 3.1-11: SAT Air Trade Area Civilian Labor Force with Unemployment Rate, 2005 – 2017



Note: SAT – San Antonio International Airport

Source: U.S. Bureau of Labor Statistics; Compiled by WSP.

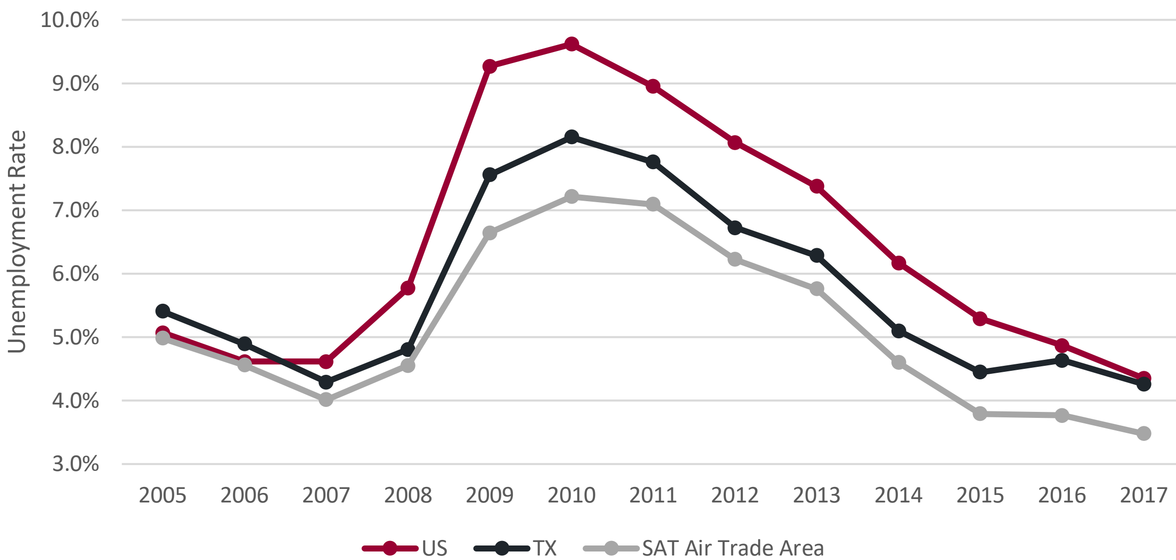
Figure 3.1-12: Labor Force and Employed Labor Force Index (2005=100) (2005 – 2017)



Source: U.S. Bureau of Labor Statistics; Compiled by WSP.

Figure 3.1-13 further demonstrates how the SAT Air Trade Area's labor force has fared favorably relative to the State of Texas and the U.S. According to the U.S. Bureau of Labor Statistics, the SAT Air Trade Area has historically observed lower unemployment rates than both the State of Texas and the nation. Additionally, the SAT Air Trade Area recovered faster from the Great Recession than both the State of Texas and the U.S.; the SAT Air Trade Area reached pre-recession unemployment levels in 2014, while the State of Texas and the U.S. did not reach pre-recession unemployment levels until 2015 and 2016, respectively.

Figure 3.1-13: Historical Unemployment Rates



Notes:
SAT – San Antonio International Airport
TX - Texas

Source: U.S. Bureau of Labor Statistics; Compiled by WSP.

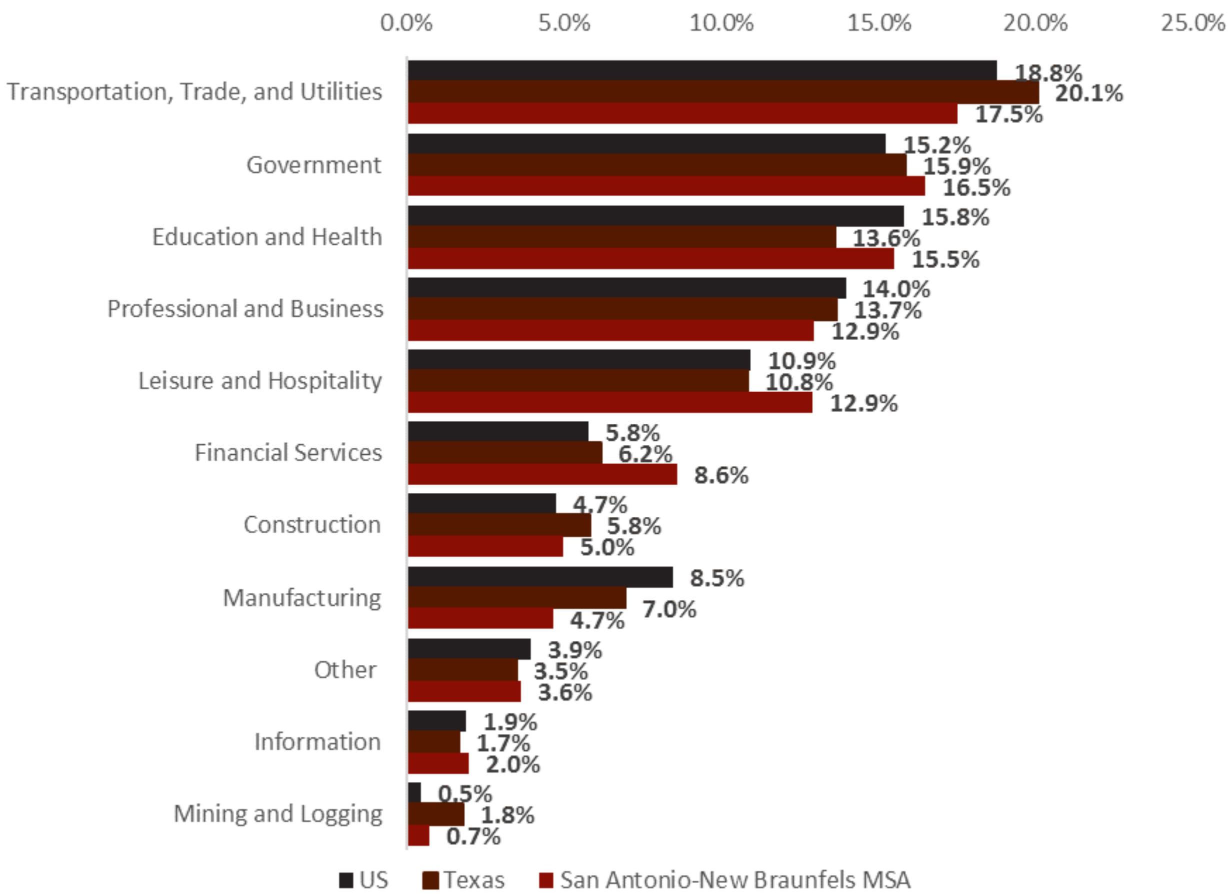
EMPLOYMENT BY INDUSTRY

Figure 3.1-14 demonstrates each industry super sector's share of the total nonfarm employment for the San Antonio-New Braunfels MSA (data was not available at the county level), the State of Texas, and the U.S. Note that as of 2017, the MSA's five most substantial sectors based on share of total nonfarm employment include:

- Transportation, Trade, and Utilities, 17.5 percent
- Government, 16.5 percent
- Education and Health, 15.5 percent
- Professional and Business, 12.9 percent
- Leisure and Hospitality, 12.9 percent

The utilities sector is driven by the energy market; for example, the Eagleford Shale Field is located southeast of San Antonio. Government employment is influenced by the strong military presence of both the U.S. Army and U.S. Air Force. Education and Health includes the biosciences industry, which has been a major focus for EDD. Note that the information sector, which includes IT and cyber security, currently makes up a relatively small share of the MSA's total nonfarm employment (2.0 percent). However, compared to the share of statewide and national total nonfarm employment, the San Antonio-New Braunfels MSA has a slightly larger share.

Figure 3.1-14: Nonfarm Employment Share by Industry Super Sector, U.S., Texas, San Antonio-New Braunfels Metropolitan Statistical Area (2017)

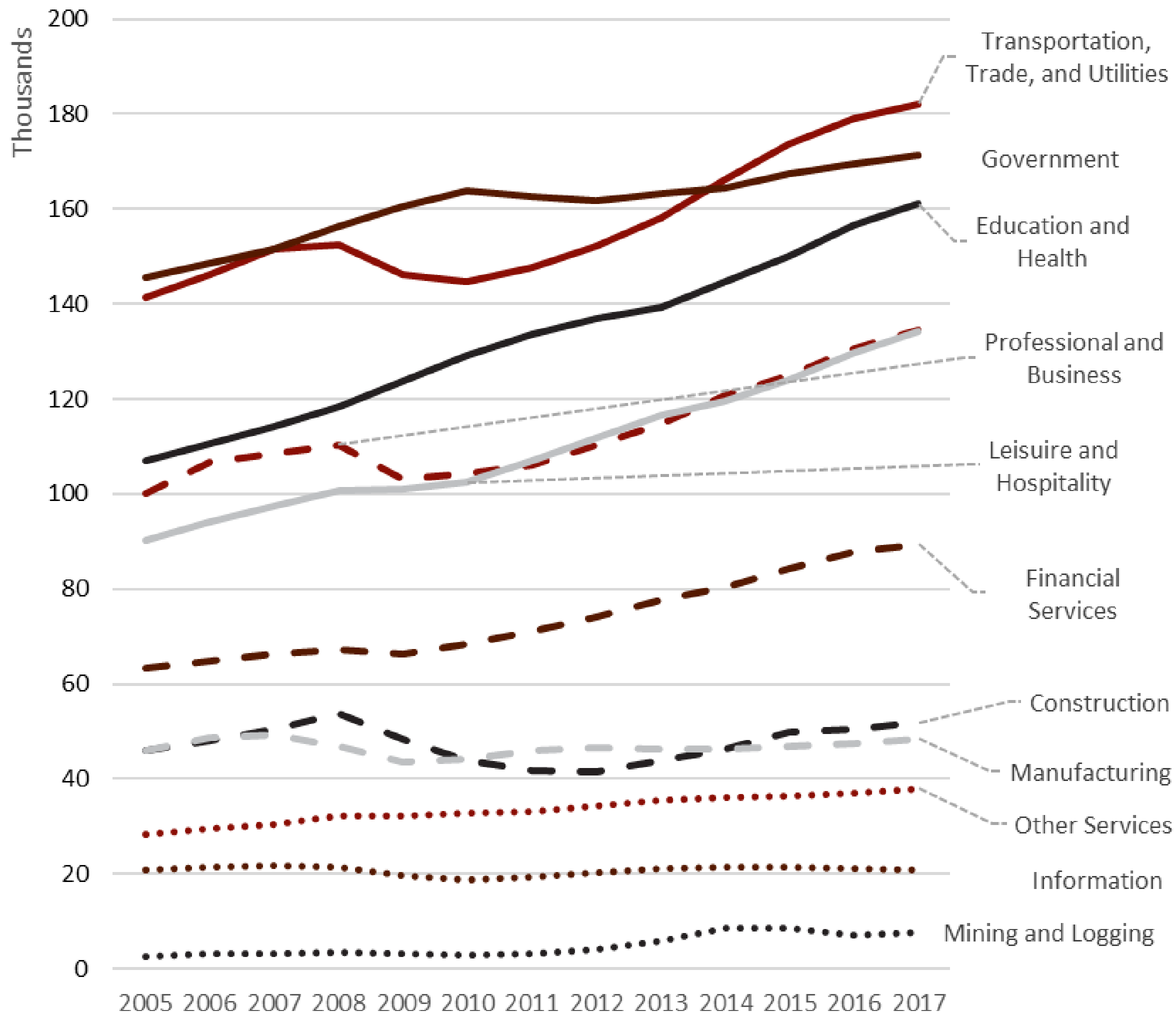


Note: MSA – Metropolitan Statistical Area

Source: U.S. Bureau of Labor Statistics; Compiled by WSP.

Figure 3.1-15 shows historical trends for San Antonio-New Braunfels MSA nonfarm employment by super sector. The current top five super sectors have historically been the most prominent for the San Antonio-New Braunfels MSA. Transportation, Trade, and Utilities sector employment decreased post-recession from 2008 through roughly 2010, but has been steadily increasing since 2011 with a CAGR of 2.1 percent from 2005 through 2017. Government (1.4 percent growth), Education and Health (3.5 percent growth), Leisure and Hospitality (3.4 percent growth), and Financial Services (2.9 percent growth) were relatively unaffected by the recession and have observed consistent growth. Employment due to the information sector has been relatively steady since 2005 with no significant growth (0.1 percent decline).

Figure 3.1-15: San Antonio-New Braunfels Metropolitan Statistical Area Nonfarm Employment by Super Sector

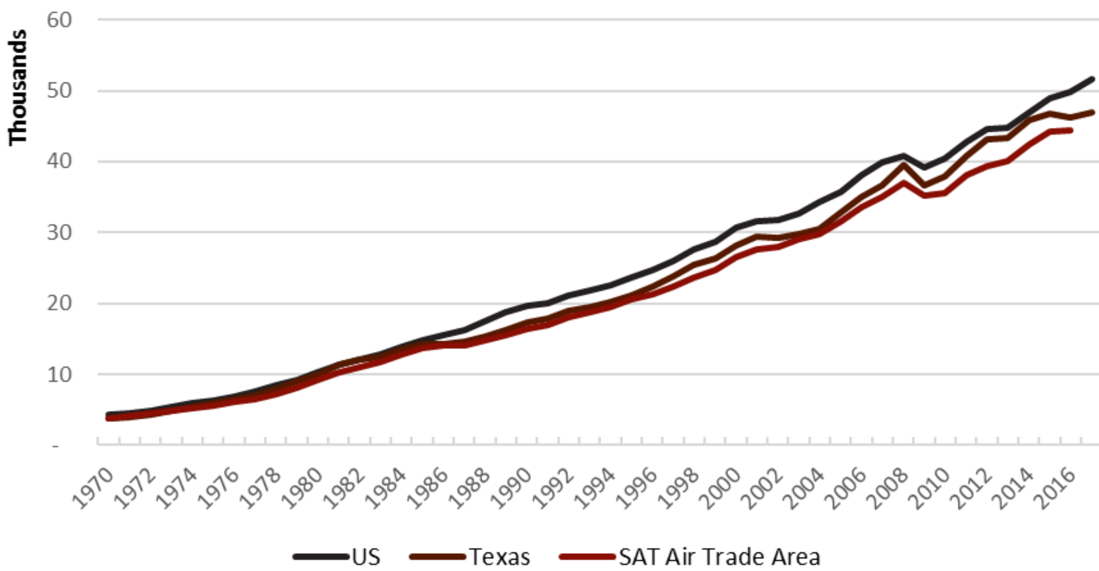


Source: U.S. Bureau of Labor Statistics; Compiled by WSP.

3.1.6 PER CAPITA INCOME

The SAT Air Trade Area's per capita income has historically been lower than that of the State of Texas and the U.S. since the late eighties. **Figure 3.1-16** demonstrates the historical trends of the SAT Air Trade Area's per capita income relative to that of Texas and the US. Per capita income of the SAT Air Trade Area was approximately $44,400 in 2016, compared to $46,200 for Texas, and $49,800 for the U.S. Figure 3.1-16 presents historical per capital personal income for the SAT Air Trade Area, the State of Texas, and the U.S.

Figure 3.1-16: Historical Per Capita Personal Income



Note: SAT – San Antonio International Airport

Source: U.S. Federal Reserve Economic Data; compiled by WSP

Analysis of cost of living and disposable income data for the City provides additional context as to the socioeconomic health of the ATA. **Table 3.1-4** provides a summary of per capita personal income, cost of living, and per capita disposable income data for the following cities in Texas: San Antonio, Houston, Dallas, and Austin. Note that per capita income data was only available at the county level through 2016, per capita income data represents the county each city is located in (Bexar, Harris, Dallas, and Travis counties respectively). Cost of living data is provided by city in 2017, and is indexed such that 1.00 = the U.S. cost of living). Disposable income data is provided by city for 2016.

Table 3.1-4: Texas City Income Comparisons

TEXAS CITY/COUNTY	COST OF LIVING COMPOSITE INDEX (2017, BY CITY)	PER CAPITA INCOME (2016, BY COUNTY)	AVERAGE PER CAPITA DISPOSABLE INCOME (2016, BY CITY)	DISPOSABLE INCOME AS A % OF TOTAL INCOME (2016)
San Antonio/Bexar County	88.1	$43,617	$19,718	45%
Houston/Harris County	98.2	$52,452	$20,422	39%
Dallas/Dallas County	102.1	$52,784	$19,414	37%
Austin/Travis County	97.5	$58,700	$20,027	34%

Sources: U.S. Federal Reserve Economic Data, EDF, U.S. Bureau of Labor Statistics, SmartAsset tax calculator; compiled by WSP.

While Bexar County has the lowest per capita income of the four major cities in Texas presented in the table, the average disposable income in the City is in line with the cities of Houston, Dallas, and Austin. Looking at the average disposable income as a percentage of the per capita income (by county), Bexar

County as the highest average disposable income relative to per capita income, at 45 percent. This result is explained by the fact that San Antonio's cost of living is notably lower than the other major cities of Texas.

3.2 COMMERCIAL PASSENGER TRAFFIC

SAT is the only commercial service airport in the SAT Air Trade Area. It was built as Alamo Airfield in 1942 by the U.S. Army and was renamed San Antonio International Airport in 1944. The Airport has since grown to become a medium hub, FAA's classification for airports that enplane 0.25 percent to 1 percent of total U.S. enplanements. The Airport placed 48th in Airports Council International – North America's ranking of North American airports (44th among U.S. airports) by total passengers in calendar year (CY) 2017.

SAT's commercial passenger traffic is predominantly domestic O&D—consisting of domestic passengers whose flights either begin or end at SAT, as distinguished from connecting passengers. The long-term growth in commercial passenger traffic at SAT closely tracked national trends, with enplanements increasing more than fivefold over the 50-year period, from FY 1968 to FY 2017. As expected, the pace of growth slowed over time. In the last 20 years, SAT's enplanements increased 26 percent in total, or 1.2 percent per year on average. The last 20 years were eventful for the U.S. aviation industry. The 2000s were particularly challenging, beginning with a U.S. economic recession and the terrorist attacks involving aviation in 2001, and ending with the 2008-2009 Great Recession. The 2000s also saw sharp increases in oil prices and corresponding increases in the largest airline cost, fuel. All these events prompted structural changes in the aviation industry in both demand and supply sides, and these changes affected trends in enplanements at the Airport.

The forecasts for commercial passenger aviation activity were developed from a hybrid forecasting framework that combines quantitative techniques and data from various sources to account for both supply and demand factors driving commercial passenger traffic trends. The forecast of passenger enplanements and aircraft operations for the first year are supply-driven, based partly on published airline flight schedules. They also reflect actual performance through April 2018. Beyond the first year, the forecasts are driven by projected trends in key market demand drivers, using multivariate regression analysis to quantify the contributions of the market demand factors to growth in enplanements. Projections of aircraft operations are derived from forecast enplanement levels, along with projections of changes in fleet mix and boarding load factors (the percentage of seats occupied on a departing aircraft).

Table 3.2-1 presents a summary of actual figures for 2017, estimates for 2018, and the designated Master Plan forecasts for 2023, 2028, and 2038:

- Enplanements will increase from an estimated 4.9 million in 2018 to 7.2 million in 2038, growing at an average annual rate of 2.0 percent.
- Commercial aircraft operations, which include passenger and all-cargo aircraft operations, will increase 1.5 percent annually on average, from 96,725 in 2018 to 131,111 in 2038.
- Noncommercial aircraft operations, which include GA and military operations, will increase from 52,729 in 2018 to 55,223 in 2038, at an average annual rate of 0.2 percent.
- The number of based aircraft will increase from 221 in 2018 to 239 in 2038, at an average annual rate of 1.2 percent.

Table 3.2-1: Summary of the Designated Master Plan Forecasts

	Actual	Estimate		Forecast		Compound Annual Growth Rate			
	2017	2018	2023	2028	2038	2018-2023	2023-2028	2028-2038	2018-2038
Enplanements (1,000s)	4,432	4,873	5,731	6,283	7,234	3.3%	1.9%	1.4%	2.0%
Commercial Aircraft Operations	92,594	96,725	108,614	116,416	131,111	2.3%	1.4%	1.2%	1.5%
Noncommercial Aircraft Operations	51,478	52,729	53,325	53,939	55,223	0.2%	0.2%	0.2%	0.2%
Based Aircraft	218	221	234	248	279	1.2%	1.2%	1.2%	1.2%

Source: Unison Consulting, Inc.

3.2.1 LONG-TERM ENPLANEMENT TRENDS

Commercial passenger traffic at SAT has been growing over the long run despite fluctuations in the short run (**Figure 3.2-1**). The Airport's enplanements increased more than fivefold, from just above 800,000 in FY 1968 to 4.43 million in FY 2017. In 50 years, the Airport saw its enplanements decrease during only 10 of those years, and four of those years of decreasing enplanements were in the 2000s. In the last 20 years, enplanements increased 26 percent, or 1.2 percent per year on average.

SAT's enplanement trends in the past 20 years reflect an eventful period for the U.S. aviation industry, and the 2000s were the most difficult years:

The long-running U.S. economic expansion from the early 1990s ended with the brief recession, which lasted from March to November 2001. While the U.S. economy was in recession, the U.S. aviation industry faced terrorist attacks on September 11, 2001.

The terrorist attacks caused an already weak air travel demand to fall sharply. They also prompted stringent airport security measures, changes in travel behavior, and business restructuring in the airline industry.

Jet fuel cost per gallon quadrupled from 2000 to 2008. It remained at record high levels through 2014. In late 2014, jet fuel prices began falling along with world oil prices, returning to mid-2000s' levels. In recent months, jet fuel prices have begun to recover and are expected to continue rising.

Amid record fuel prices, the U.S. economy entered the Great Recession from December 2007 to June 2009. The Great Recession was the longest and deepest recession since the Great Depression. The recovery from this recession was also the slowest of all recoveries from previous recessions since the Great Depression. The Great Recession spread globally and weakened demand for domestic and international passenger and cargo air services.

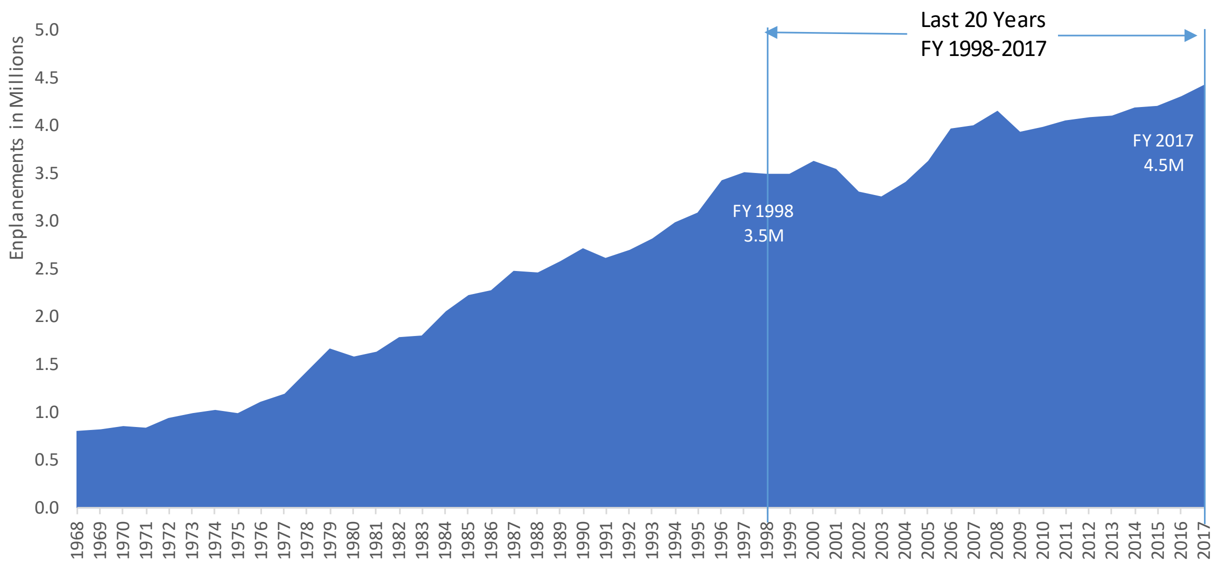
Financial difficulties led many airlines to bankruptcy filings, business restructuring, mergers, and, in certain cases, liquidation.

Airlines responded to weak air travel demand and high fuel prices with cuts in domestic seat capacity, increases in load factors, retirement of old aircraft, fleet reconfiguration, route transfers between mainline and regional service, route network changes, pricing changes, and various other cost-cutting measures. The cuts in domestic seat capacity fell disproportionately on smaller airports, including medium hubs like SAT.

Traffic was also affected by bad weather, natural disasters, disease outbreaks, wars, and civil unrest in different parts of the world.

Figure 3.2-1: SAT Long-Term Enplanement Trends

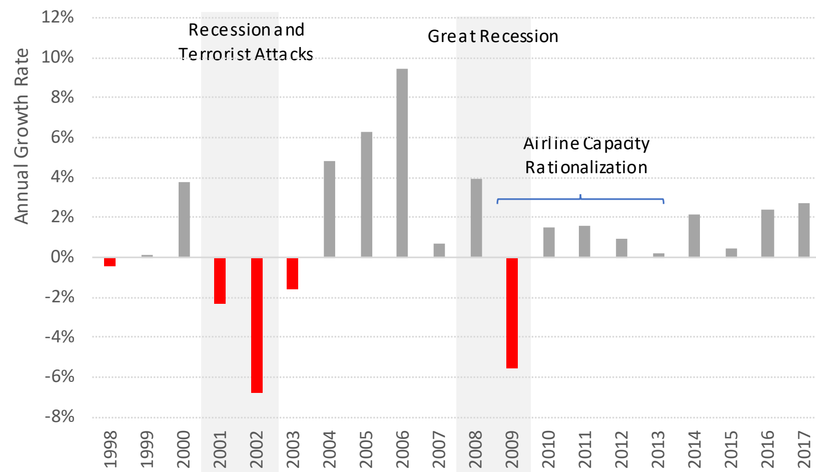
Enplanement Trends, FY 1968-2017



Enplanement Trends, FY 1998-2017

FY	Enplanements (1,000s)
1998	3,504
1999	3,508
2000	3,639
2001	3,556
2002	3,316
2003	3,264
2004	3,423
2005	3,637
2006	3,980
2007	4,008
2008	4,166
2009	3,935
2010	3,995
2011	4,057
2012	4,094
2013	4,104
2014	4,193
2015	4,212
2016	4,314
2017	4,432

Annual Enplanement Growth, FY 1998-2017



Average Annual Growth Rate = 1.2%

Notes:

FY – Fiscal Year

SAT – San Antonio International Airport

Source: San Antonio Department of Aviation; Compiled by Unison Consulting, Inc.

These developments have had significant and lasting effects on the U.S. aviation industry. Following the 2001 recession and terrorist attacks, SAT saw decreases in enplanements in three consecutive years through 2003, all in all a 10 percent decrease from FY 2000 to FY 2003. Growth followed in the next five consecutive years, including 2008, the first year of the Great Recession. Enplanements set new high records, reaching 4.2 million just before decreasing 5.6 percent in 2009.

In 2010, the first year of recovery from the Great Recession, U.S. airlines, as an industry, began to see profits. Their business restructuring efforts and capacity restraint began producing good financial results, helped by significant decreases in fuel cost and the strengthening of air travel demand. At SAT, enplanements resumed growth at a slow and steady pace, averaging 1.5 percent per year through FY 2017.

Today, U.S. airlines continue to enjoy relatively low fuel costs and earn net profits. Markedly improved financial performance has allowed them to renew their fleets and increase scheduled flights and seats while maintaining capacity discipline. SAT is benefitting from the increase in airline capacity, with enplanements on track to increase 10 percent in FY 2018 based on actual performance through June and scheduled seats for the remainder of the year. For the nine-month period ending in June 2018, SAT's enplanements posted a year-over-year increase of 9.3 percent. For the remaining three months in FY 2018, scheduled seats show a year-over-year increase of 11.3 percent.

3.2.2 AIRPORT AND U.S. ENPLANEMENT TRENDS

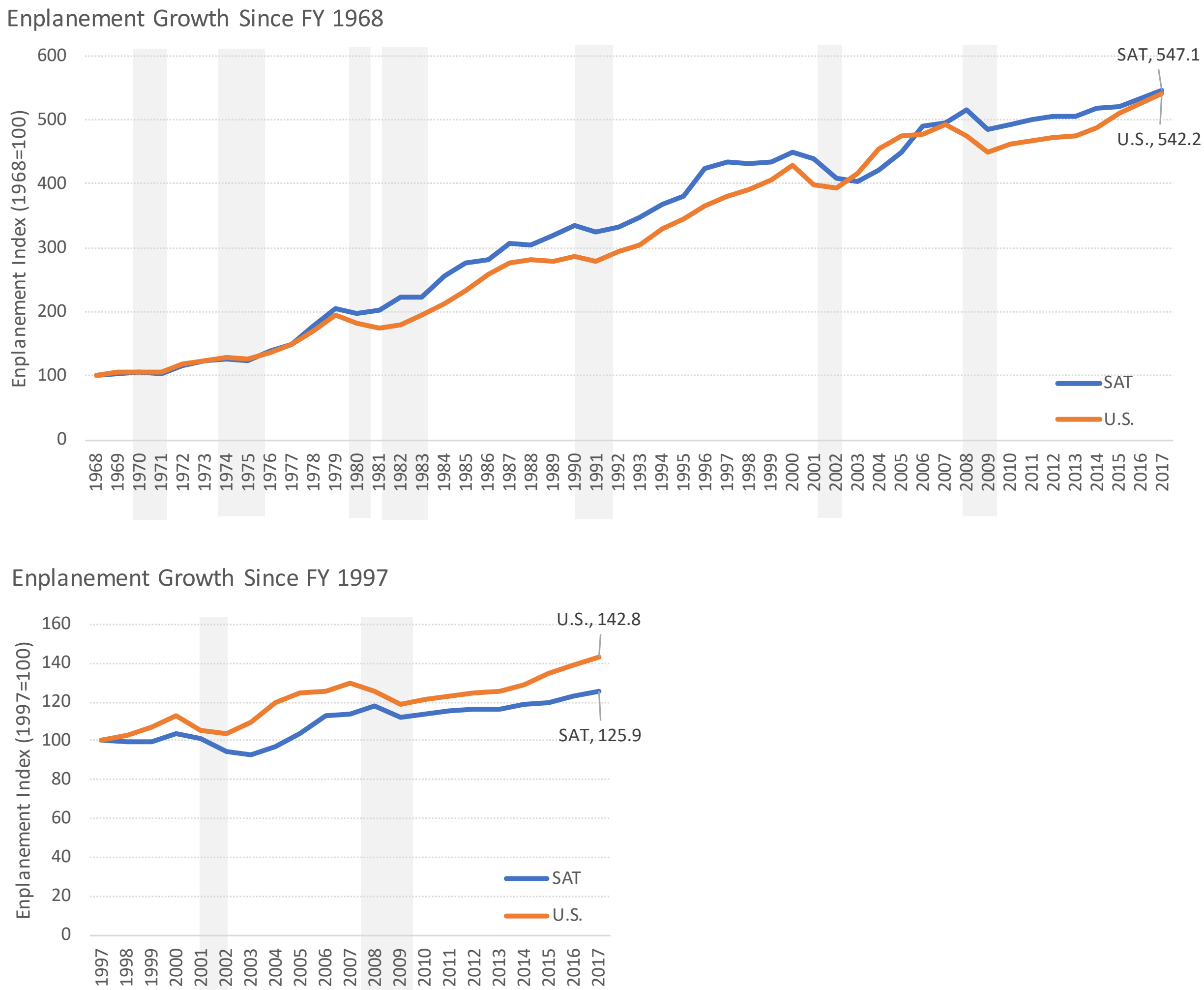
SAT's long-term enplanement growth trends closely tracked national trends (**Figure 3.2-2**). The short-term dips in SAT's traffic also generally coincided with the short-term dips at the national level, as did high growth periods. The dips in traffic typically occurred during economic downturns. In 2001, the dip in traffic resulted from both the economic recession and the 2001 terrorist attacks.

From FY 1968, SAT's enplanements increased more than five-fold, as did U.S. total enplanements. Over the 50-year period, the Airport outpaced the nation in cumulative enplanement growth by less than 5 percentage points. In the last 20 years, however, the pace of enplanement growth at SAT slowed relative to the national pace. From FY 1997 to FY 2017, SAT enplanements grew 26 percent, significantly less than the 43 percent cumulative growth in U.S. total enplanements. SAT maintained a share of at least 0.5 percent of total U.S. enplanements, falling within FAA's medium hub airport classification.[1]

In the last two years, enplanement growth at SAT accelerated to keep pace with national growth trends, and, in FY 2018, SAT's enplanements are on track to grow at twice the national rate.

[1] By FAA classification, a medium hub enplanes 0.25 percent to 1 percent of total U.S. enplanements.

Figure 3.2-2: Comparison of Long-Term Enplanement Growth Trends at SAT and Nationwide



Notes:

FY – Fiscal Year

SAT – San Antonio International Airport

Shaded areas are recession periods.

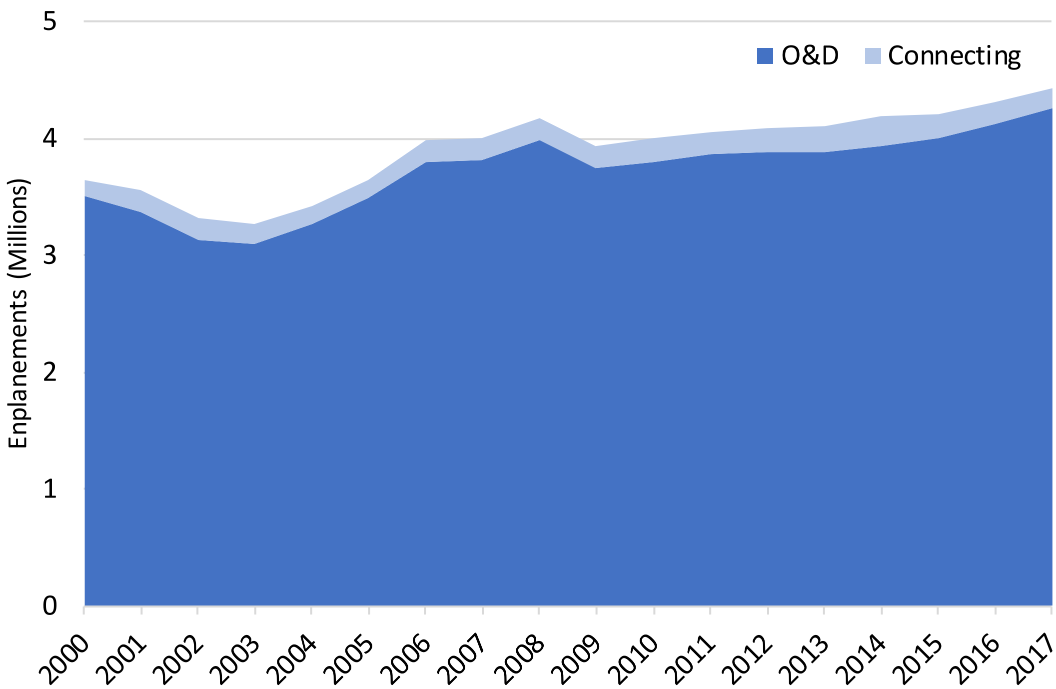
Source: San Antonio Department of Aviation and U.S. DOT BTS. SAT annual enplanements are on the airport's fiscal year basis. U.S. enplanements are on calendar year basis. Compiled by Unison Consulting, Inc.

3.2.3 ORIGIN AND DESTINATION AND CONNECTING TRAFFIC COMPOSITION

SAT passengers consist largely of O&D traffic—passengers who begin and end their air travel at the Airport. Since 2000, the share of O&D traffic has remained constant at approximately 95 percent (**Figure 3.2-3**). Connecting traffic makes up the remaining share of around 5 percent. Having predominantly O&D traffic reduces an airport's vulnerability to changes in airline route networks. Unlike connecting traffic which is brought by an airline and can go away with changes in airline routing, O&D traffic is generated by an airport's service area. As long as O&D traffic is strong, airlines will come to serve an airport.

Most connecting passengers at SAT fly Southwest Airlines. The top five 5 origin or destination airports for connecting passengers are Dallas Love Field (DAL), Los Angeles (LAX), San Diego (SAN), El Paso (ELP), and Houston Hobby (HOU) where Southwest Airlines has a large presence.

Figure 3.2-3: Origin and Destination and Connecting Traffic (Fiscal Years 2000-2017)



Note: O&D – origin-and-destination

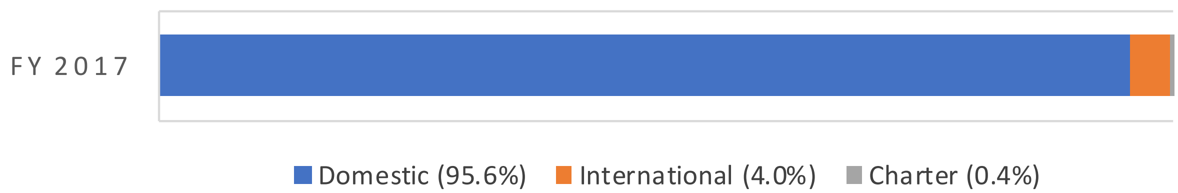
Source: San Antonio Department of Aviation and estimates by Unison Consulting, Inc., based on data from the U.S. DOT DB1B; Compiled by Unison Consulting, Inc.

3.2.4 DOMESTIC AND INTERNATIONAL TRAFFIC COMPOSITION

The Airport serves predominately scheduled domestic traffic, which accounted for 95.6 percent of FY 2017 enplanements (**Figure 3.2-4**). Scheduled international traffic accounted for 4 percent and charter traffic accounted for the remaining 0.4 percent. These relative shares have not changed materially in the last five years.

Figure 3.2-4: Domestic and International Composition of SAT Enplanements

FY	Scheduled				Charter		Total
	Domestic		International				
	EP (1,000s)	Share	EP (1,000s)	Share	EP (1,000s)	Share	EP (1,000s)
2013	3,846	93.7%	235	5.7%	23	0.6%	4,104
2014	3,937	93.9%	224	5.3%	32	0.8%	4,193
2015	3,936	93.4%	254	6.0%	22	0.5%	4,212
2016	4,088	94.8%	208	4.8%	18	0.4%	4,314
2017	4,234	95.6%	177	4.0%	21	0.4%	4,432



Notes:

EP – enplanements

FY – Fiscal Year

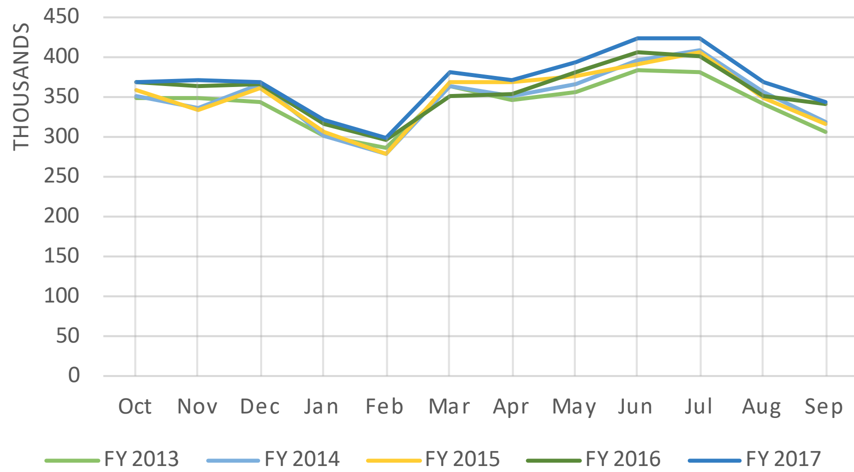
Source: San Antonio Department of Aviation; Compiled by Unison Consulting, Inc.

3.2.5 SEASONALITY IN ENPLANEMENTS

Monthly enplanements show a seasonal pattern (**Figure 3.2-5**). Traffic levels are typically at their lowest in January and February. They are at their highest in June and July, after which they begin to fall to a summer-end low in September.

Figure 3.2-5: Monthly Enplanement Trends

Average Share by Month	
Oct	8.4%
Nov	8.3%
Dec	8.5%
Jan	7.3%
Feb	6.8%
Mar	8.6%
Apr	8.4%
May	8.8%
Jun	9.4%
Jul	9.5%
Aug	8.3%
Sep	7.6%



Notes: FY – Fiscal Year

Source: City of San Antonio Department of Aviation; Compiled by Unison Consulting, Inc.

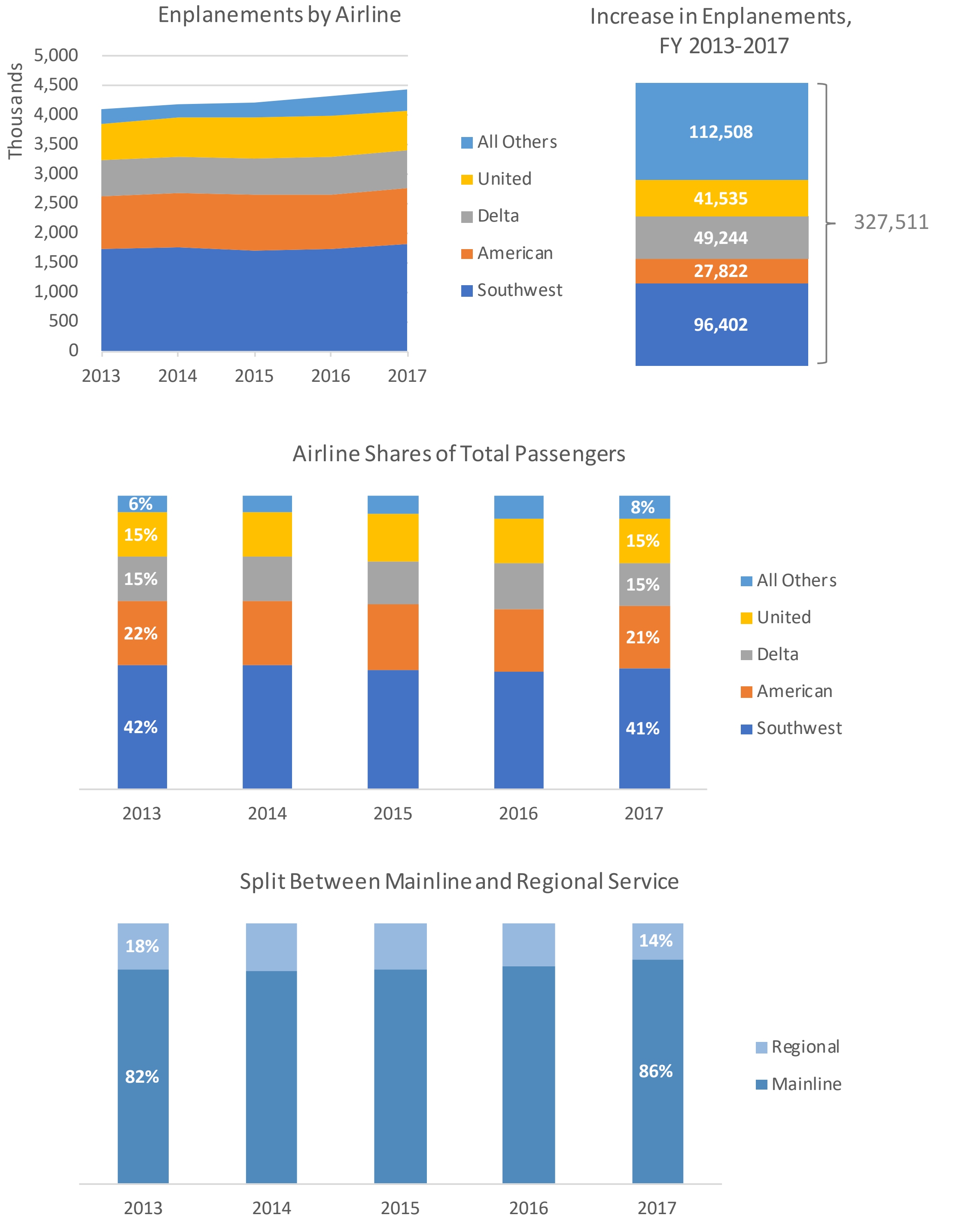
3.2.6 AIRLINE MARKET SHARES

Figure 3.2-6 shows the trends in SAT enplanements by airline in the last five years. The recent wave of airline consolidation left the industry with four major airlines controlling the large majority of U.S. passenger traffic. These four major airlines accounted for 92 percent of SAT enplanements in FY 2017, with Southwest Airlines holding the largest share (41 percent), followed by American Airlines (21 percent), Delta Air Lines (15 percent), and United Airlines (15 percent). The remaining 8 percent of SAT enplanements are eight other scheduled passenger carriers (three U.S. carriers and five foreign flag carriers) and several charter operators. These market shares have not changed materially in the last five years.

The growth in enplanements at SAT over the last five years is broad-based, with all four major airlines and all the other airlines as a group showing growth in enplanements. SAT enplanements increased by 327,511 from FY 2013 to FY 2017. Southwest Airlines and the group of all the other smaller scheduled and nonscheduled carriers were the largest contributors.

San Antonio was the second city to receive Southwest Airlines service. Southwest Airlines began serving the Airport in June 1971 with 6 daily nonstop departures to Dallas Love Field. As of June 5, 2018, Southwest operated 53 departures per day from SAT to 22 cities.

Figure 3.2-6: Enplanements by Airline (Fiscal Years 2013-2017)



Notes:

Southwest includes AirTran's enplanements prior to post-merger integration.

United includes Continental's enplanements prior to post-merger integration.

American includes US Airway's enplanements prior to post-merger integration.

Mainline includes charter enplanements.

Source: City of San Antonio Department of Aviation; Compiled by Unison Consulting, Inc.

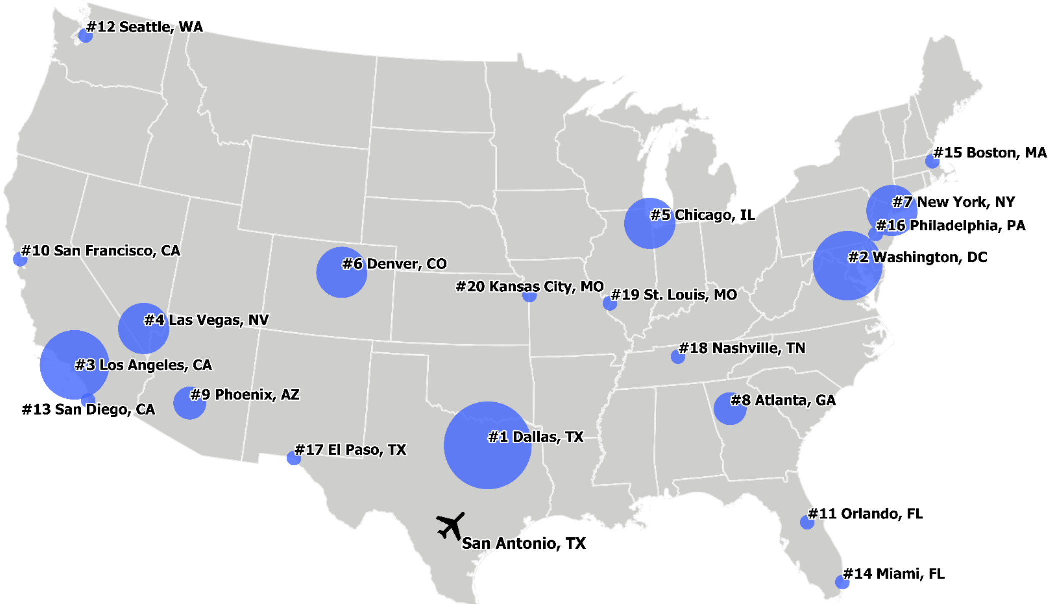
Figure 3.2-6 also shows that mainline service gained market share from regional service over the past five years, a trend that reflects the growing industry practice of airline fleet upgauging[2]. Airlines have been adding capacity without increasing flights by replacing regional service with mainline service, by adding more seats to existing aircraft, and by retiring smaller aircraft from their active fleet and replacing them with larger aircraft.

3.2.7 TOP DOMESTIC ORIGIN AND DESTINATION MARKETS

Figure 3.2-7 shows the SAT's top 20 domestic O&D markets in CY 2017, ranked by share of O&D enplanements at the Airport. They include 18 of the 30 largest U.S. metropolitan areas. The top 20 markets accounted for 63 percent of SAT's O&D enplanements.

[2] The FAA defines mainline carriers as airlines that provide service using aircraft with 90 seats or more. Regional carriers are defined as airlines that offer service with smaller aircraft (less than 90 seats) and typically fly routes that supplement the networks of mainline carriers.

Figure 3.2-7: Top 20 Origin and Destination Markets (2017)



2017 Ranking	Metropolitan Area (2016 Population Ranking)	Airports	Share of SAT O&D Market Passengers
1	Dallas, TX (4)	DAL, DFW	6.8%
2	Washington, DC (6)	BWI, DCA, IAD	5.4%
3	Los Angeles, CA (2)	BUR, LAX, LGB, ONT, SNA	5.3%
4	Las Vegas, NV (29)	LAS	5.1%
5	Chicago, IL (3)	MDW, ORD	4.8%
6	Denver, CO (19)	DEN	4.5%
7	New York, NY (1)	EWR, HPN, ISP, JFK, LGA, SWI	4.4%
8	Atlanta, GA (9)	ATL	3.9%
9	Phoenix, AZ (12)	PHX	2.8%
10	San Francisco, CA (11)	SFO, SJC	2.5%
11	Orlando, FL (23)	MCO	2.2%
12	Seattle, WA (15)	SEA	2.1%
13	San Diego, CA (17)	SAN	2.1%
14	Miami, FL (8)	FLL, MIA	1.7%
15	Boston, MA (10)	BOS, MHT, PVD	1.7%
16	Philadelphia, PA (7)	PHL	1.6%
17	El Paso, TX (68)	ELP	1.6%
18	Nashville, TN (36)	BNA	1.6%
19	St. Louis, MO (20)	STL	1.6%
20	Kansas City, MO (30)	MCI	1.5%
	Top 20 Destinations		**63%**
	Other Destinations		**37%**

Notes:

O&D – Origin and Destination

SAT – San Antonio International Airport

Sources: U.S. DOT 10%-sample airline ticket survey, U.S. Census Bureau, and Unison Consulting, Inc.

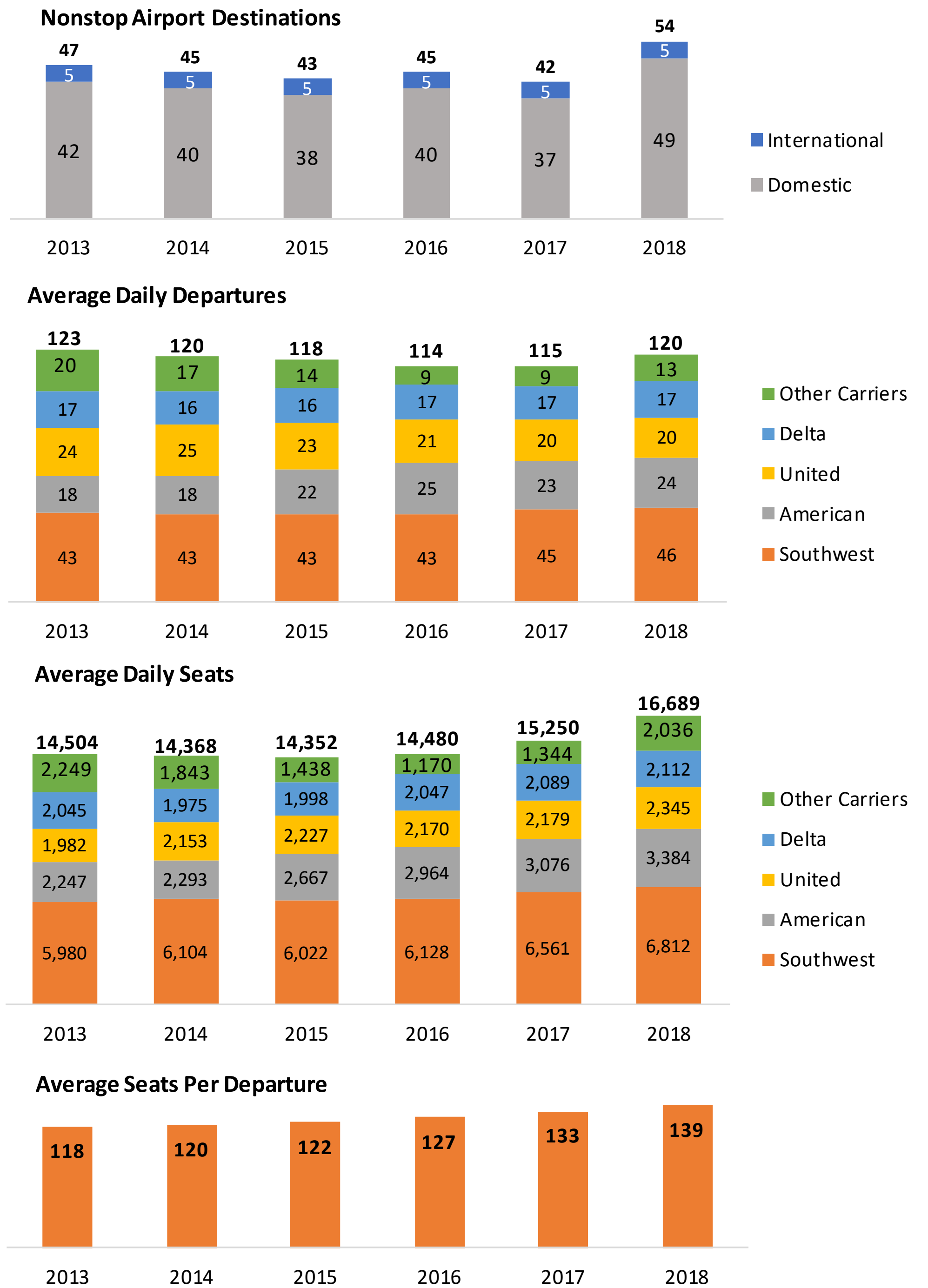
3.2.8 SCHEDULED PASSENGER AIRLINE SERVICE

Figure 3.2-8 shows the trends in scheduled passenger airline service at SAT from CY 2013 to CY 2018. The published airline schedules for CY 2018 show nonstop passenger service to 54 airports—49 in the United States, four in Mexico and one in Canada, also shown in **Figure 3.2-9**. These 54 destinations represent a net increase of 12 from the previous year. Flight departures and seats also increased by 4.9 percent and 9.4 percent, respectively, from the previous year. Seats are at their highest levels over the six-year period. The increasing trend in average seats per departure, from 118 in 2013 to 139 in 2018, reflects the growing industry practice of aircraft upgauging.

The distribution of scheduled seats by airline is consistent with the airlines' enplanement shares. Southwest accounts for largest share of seats (41 percent), followed by American (20 percent), United (14 percent), Delta (13 percent), and all other carriers (12 percent). All four major U.S. carriers and the group of all other smaller carriers show increases in scheduled seats for CY 2017 and CY 2018 (**Figure 3.2-10**). The following factors likely contributed to the expansion in scheduled passenger airline service at SAT: (1) continuing economic expansion in the region and nationwide, (2) fleet renewal and expansion by U.S. airlines, and (3) the City of San Antonio Department of Aviation's proactive air service development initiatives.

Even though no single airline controls a majority share of scheduled seats at SAT, the Airport's market is considered highly concentrated based on a Herfindahl-Hirschman Index (HHI) of 2,503 in CY 2018, calculated based on airlines' shares of scheduled seats. The HHI is the sum of the square of each airline's share of seats. Using the U.S. Department of Justice criteria for evaluating the competitiveness of a marketplace, an HHI of 2,500 or greater is considered a highly-concentrated market place with four or fewer effective competitors. SAT's HHI of 2,503 just crosses the threshold of high market concentration. This market concentration index has increased over time at SAT. **Figure 3.2-11** measures market concentration in terms of airline shares of scheduled seats in CY 2018 for all medium hub airports. All but one airport shows moderate to high market concentration.

Figure 3.2-8: Trends in Scheduled Passenger Service (2013-2018)

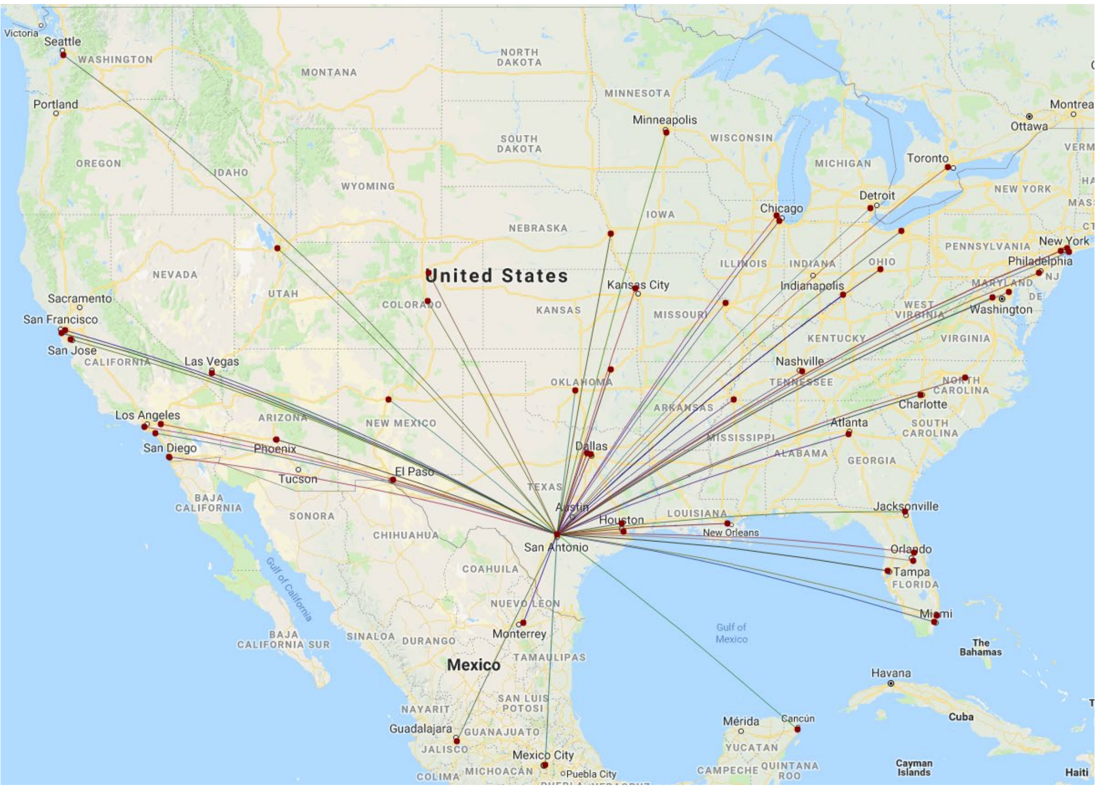


Notes:

Southwest includes AirTran's service prior to post-merger integration. United includes Continental's service prior to post-merger integration. American includes US Airway's service prior to post-merger integration.

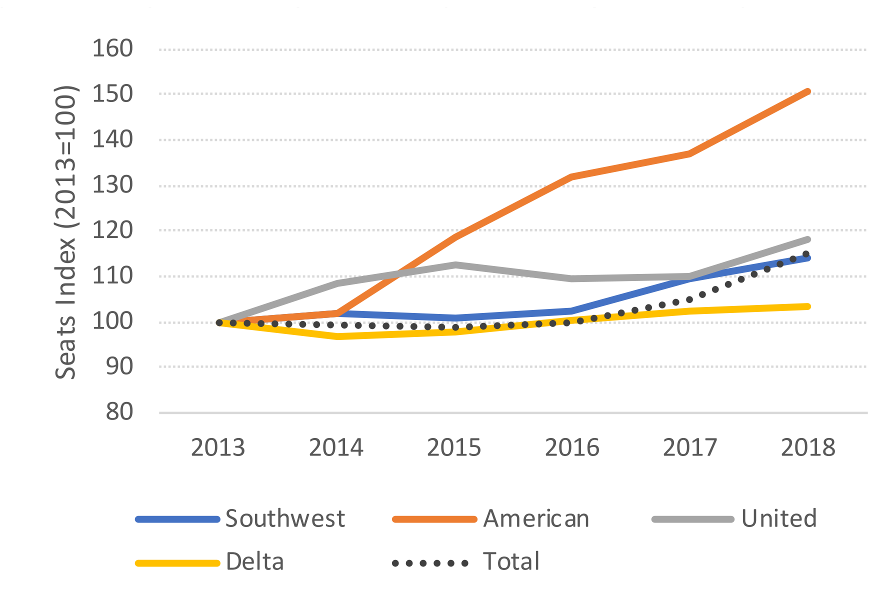
Source: OAG Schedules Analyzer; Compiled by Unison Consulting, Inc.

Figure 3.2-9: Nonstop Destinations (2018)



Source: Official Airline Guide Schedules Analyzer; Compiled by Unison Consulting, Inc.

Figure 3.2-10: Trends in Scheduled Seats by Airline (2013-2018)



Notes:

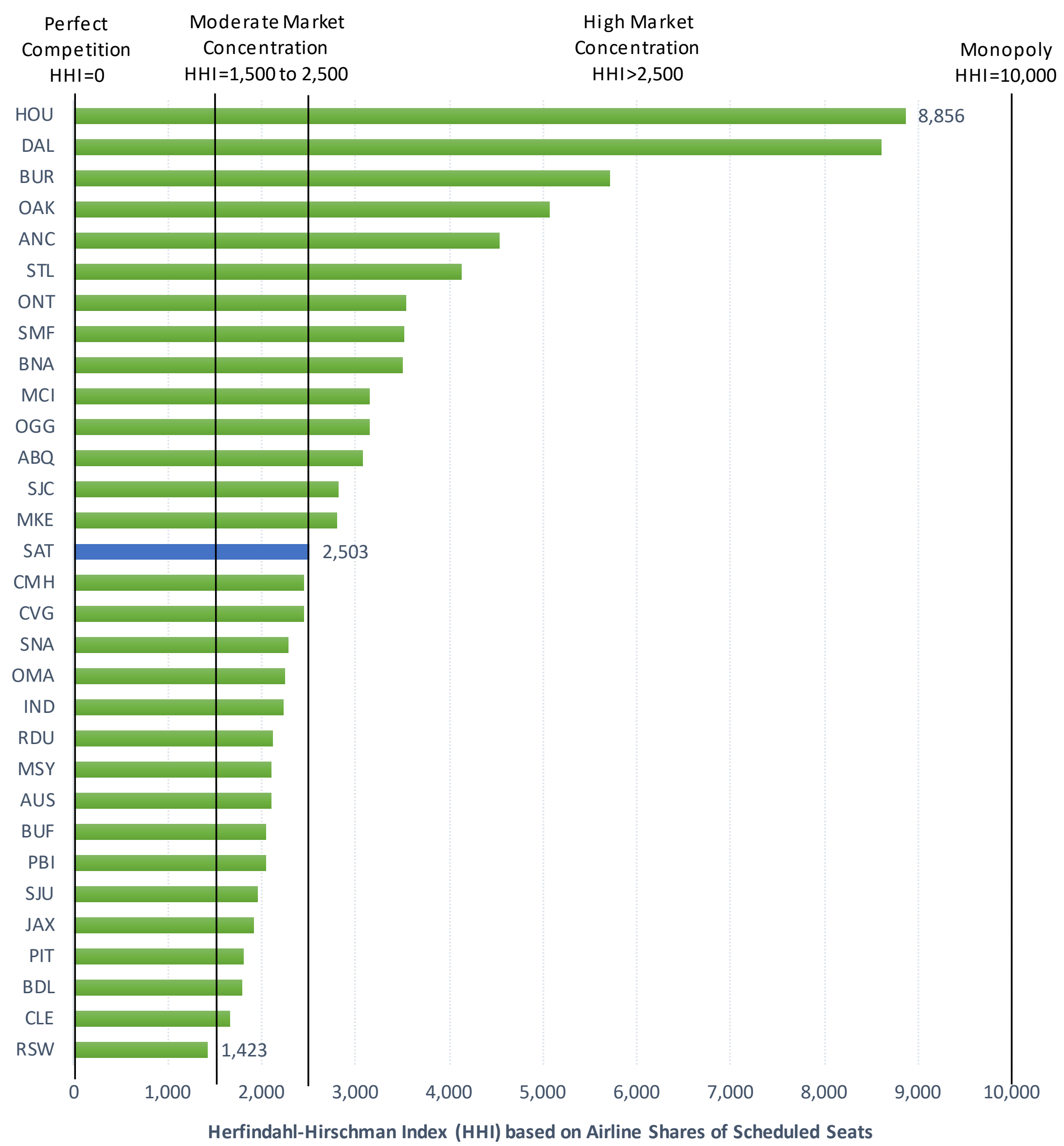
Southwest includes AirTran's seats prior to post-merger integration.

United includes Continental's seats prior to post-merger integration.

American includes US Airway's seats prior to post-merger integration.

Source: Official Airline Guide Schedules Analyzer; Compiled by Unison Consulting, Inc.

Figure 3.2-11: Herfindahl-Hirschman Index (HHI) Based on Medium Hub Airports' Airline Shares of Scheduled Seats (2018)



Note: HHI - Herfindahl-Hirschman Index

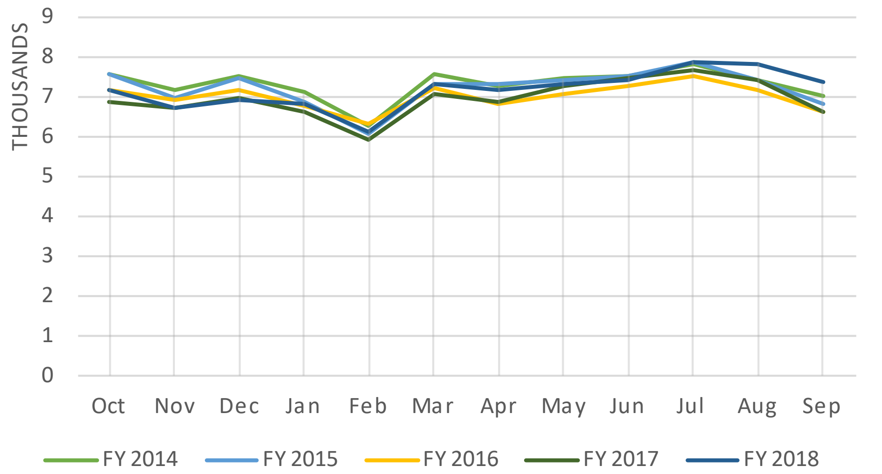
Source: Official Airline Guide Schedules Analyzer and Unison Consulting, Inc.

3.2.9 COMMERCIAL PASSENGER AIRCRAFT OPERATIONS: MONTHLY DISTRIBUTION AND PEAK MONTH AVERAGE DAY DISTRIBUTION

Figure 3.2-12 shows the monthly distribution of commercial passenger aircraft operations at SAT, based on airline flight schedules for FY 2014 through FY 2018. The peak month for aircraft operations is July, with an average of 9.1 percent of annual aircraft operations taking place during this month.

Figure 3.2-12: Monthly Scheduled Passenger Aircraft Operations (October 2013-September 2018)

Average Share by Month	
Oct	8.5%
Nov	8.1%
Dec	8.4%
Jan	8.0%
Feb	7.2%
Mar	8.5%
Apr	8.3%
May	8.5%
Jun	8.7%
Jul	9.1%
Aug	8.7%
Sep	8.0%



Note: FY – Fiscal Year

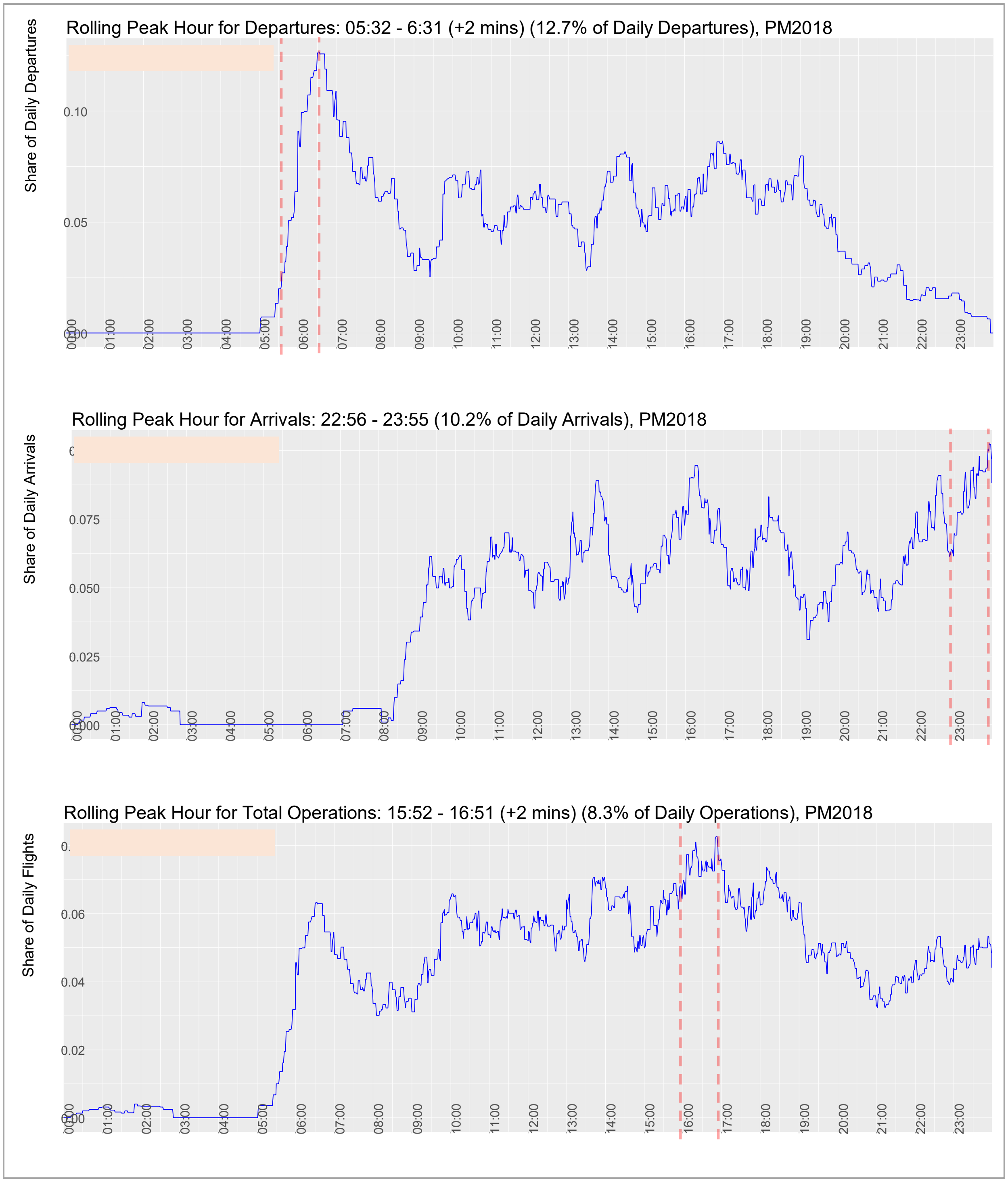
Source: Official Airline Guide Schedules Analyzer and Unison Consulting, Inc.

Figure 3.2-13 shows SAT's rolling hour aircraft operations for the average day in July 2018, based on airline flight schedules. Arrivals and departures are distributed differently throughout the day. The peak hour for aircraft departures is from 5:32 a.m. to 6:31 a.m.; 12.7 percent of daily departures take place during this 1-hour period. The peak hour for aircraft arrivals is from 10:56 p.m. to 11:55 p.m.; 10.2 percent of daily arrivals take place during this 1-hour period. The peak hour for total aircraft operations (departures and arrivals) is from 3:52 p.m. to 4:51 p.m.; 8.3 percent of total daily aircraft operations take place during this 1-hour period.

Figure 3.2-13 also provides the peak hour factor (PHF), a measure adapted from ground traffic flow analysis. This measure is calculated by dividing the number of flights in the rolling peak hour by the flow rate within the peak 15-minute period of the peak 1-hour period. It provides a relative measure of how consistent aircraft operations are during the identified peak hour. A PHF approaching 1 suggests that there is a consistent flow of operations during the peak hour, such that the number of flights in every 15-minute interval of the peak 1-hour period are nearly the same. A PHF approaching 0 indicates that there is high variability in the number of flights within the peak 15-minute period of the peak hour. SAT's PHFs are 0.58 for flight departures, 0.66 for flight arrivals, and 0.74 for total operations.

Also based on flight schedules, **Figure 3.2-14** shows SAT's rolling hour seats for the average day in July. The distribution of seats throughout the day are similar to aircraft operations. The peak hour for aircraft departing seats is from 5:32 a.m. to 6:31 a.m.; 11.5 percent of daily departing seats take place during this 1-hour period. The peak hour for aircraft arriving seats is from 11:00 p.m. to 11:59 p.m.; 9.9 percent of daily arriving seats take place during this 1-hour period. The peak hour for total aircraft seats (departing and arriving) is from 3:21 p.m. to 4:20 p.m.; 8.0 percent of total daily seats take place during this 1-hour period. SAT's PHFs for departing, arriving and total seats are 0.58, 0.69, and 0.77, respectively, also shown in Figure 3.2-14. SAT's PHFs based on seats are comparable to PHFs calculated for flight departures, flight arrivals, and total operations.

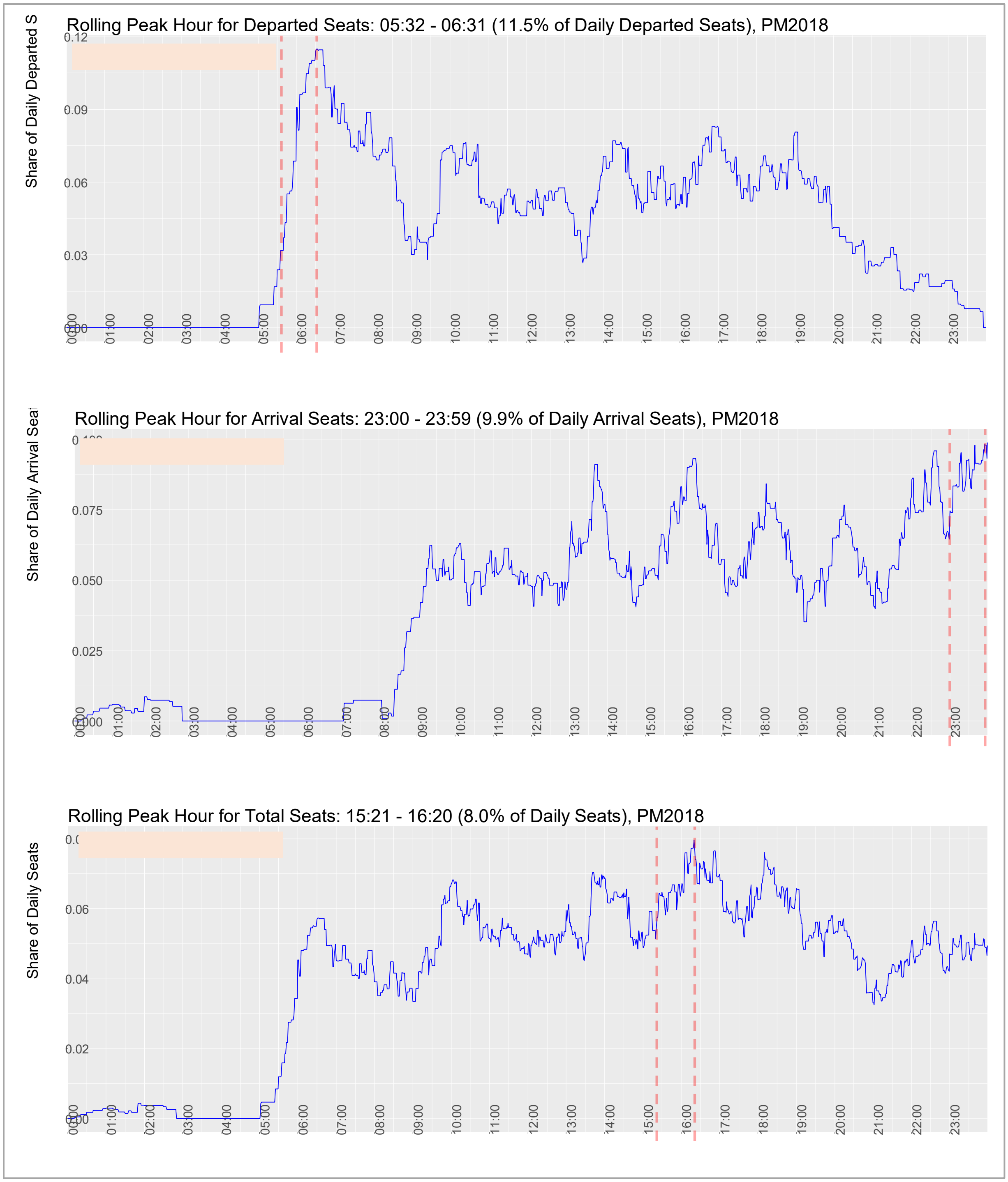
Figure 3.2-13: Commercial Passenger Aircraft Operations by Rolling Hour (July 2018 - Peak Month)



Note: PM – Peak Month

Source: Official Airline Guide Schedules Analyzer and Unison Consulting, Inc.

Figure 3.2-14: Commercial Passenger Seats by Rolling Hour during (July 2018 – Peak Month)



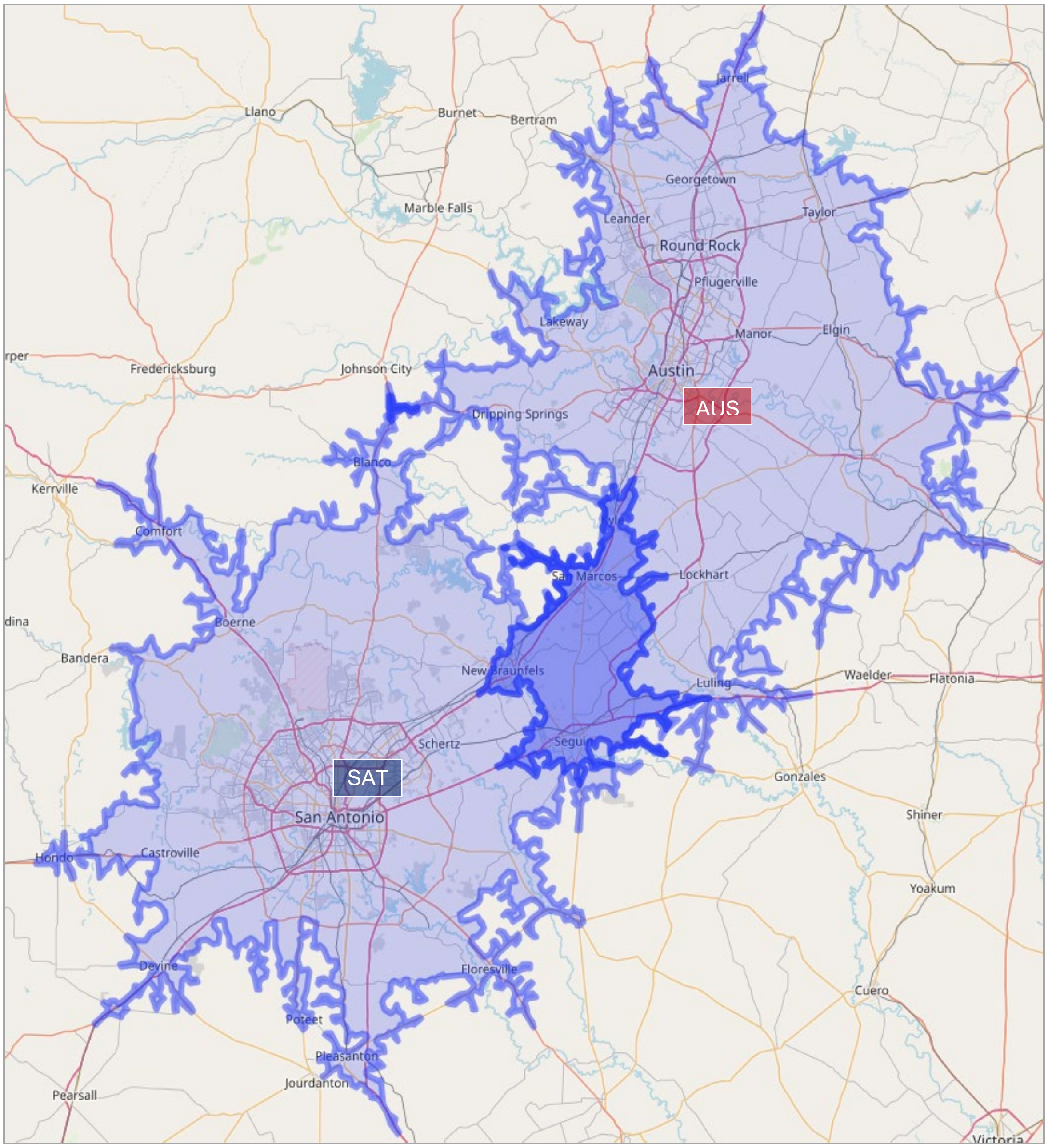
Note: PM – Peak Month

Source: Official Airline Guide Schedules Analyzer and Unison Consulting, Inc.

3.2.10 COMPETITION FROM THE NEAREST COMMERCIAL SERVICE AIRPORT

Located 77 miles northeast from SAT is Austin-Bergstrom International Airport (AUS), the primary airport serving the Austin metropolitan area. As shown in **Figure 3.2-15**, the two airports' air service areas overlap.

Figure 3.2-15: One-Hour Drive Areas from SAT and AUS



Notes:

SAT – San Antonio International Airport

AUS - Austin–Bergstrom International Airport

Source: Unison Consulting, Inc., using OpenStreetMap and openrouteservice APIs for R.

Figure 3.2-15 delineates the areas within a 1-hour drive from SAT and AUS, considering the 85-mph speed limit on segments of SH 130. The darker shading indicates where the 1-hour drive areas from these two airports overlap. A 2016 passenger traffic leakage study done for SAT using 2015 data found that AUS attracts an estimated 8 percent of passengers from SAT's air service area.

Since opening in 1999 to replace Austin's old airport, Robert Mueller Municipal Airport, AUS has grown faster than SAT. In the early 1990s, before AUS opened, SAT had 20 percent more passenger traffic than Robert Mueller Municipal Airport. Since 2015, AUS has enplaned at least 30 percent more passengers than SAT. AUS' faster commercial traffic growth can be attributed to two key factors: generally lower airfares and greater frequency of nonstop flights (**Table 3.2-2**).[3]

Table 3.2-2: SAT and AUS Comparison Metrics (2017)

MEASURE	SAT	AUS	% DIFFERENCE
Enplanements (Millions)	4.52	6.23	29%
Nonstop Destinations[1]	34	53	56%
Weekly Frequency	802	1,151	43%
Average Passenger Yield[2]	$0.20	$0.19	-5.7%

Notes:

[1] Nonstop destination cities counted if served with at least 12 flights in 2017.

[2] Airline revenue per revenue passenger mile.

AUS - Austin–Bergstrom International Airport

SAT – San Antonio International Airport

Source: Official Airline Guide Schedules Analyzer, U.S. DOT DB1B and Unison Consulting, Inc.

Not shown on Figure 3.2-15, located more than 200 miles northeast of SAT, is George Bush Intercontinental Airport/Houston (IAH). IAH is one of the country's major international gateway airports. IAH attracts international passengers from distant areas, including San Antonio. As a major international gateway and connecting hub, IAH provides far greater network connectivity and flight frequency than SAT.

3.2.11 AIR SERVICE DEVELOPMENT

SAT has a robust Air Service Development (ASD) program built on a strategy of aligning the Airport's goals with those of individual carriers. The Airport's ASD team frequently meets with local businesses and community stakeholders to foster relationships with potential air carriers. The ASD team identifies potential carriers using a highly analytical data-driven process and regularly attends major air service and trade conferences to meet with potential carriers to "pitch" new air service opportunities at SAT. These initial meetings are followed by meetings at the airlines' headquarters to present in-depth route forecast analyses and discuss potential air service viability. The Airport has offers incentives to new and existing carriers that begin flights to new destinations. The Airport's FAA-approved comprehensive incentive package includes landing fee waivers, terminal fee waivers, and co-operative funds to help advertise new routes.

[3] Fare differences at the airports are themselves driven by air travel demand and airline competition at each airport.

As a result of ASD initiatives, SAT has recently obtained numerous new markets and airlines. In 2015, Allegiant Airlines began flying from the Airport to Las Vegas, Fort Lauderdale and Orlando/Sanford. In 2017, Volaris launched non-stop service from SAT to Mexico City following their initial flight from SAT to Guadalajara in 2013. Air Canada began non-stop service from SAT to Toronto in 2017 and Interjet inaugurated a service to Leon, Mexico (in addition to services to Mexico City, Guadalajara and Monterrey), in June 2018. In April 2018, Frontier Airlines added new routes from the Airport to Cincinnati, Colorado Springs, Orlando, Raleigh-Durham and San Jose. In August 2018, Frontier Airlines launched new nonstop flights from SAT to an additional 11 new destinations including Orange County, Jacksonville, Omaha, Charlotte, Tulsa, Cleveland, Memphis, Oklahoma City, Albuquerque, Columbus, and Salt Lake City. Frontier Airlines currently provides service to 25 domestic destinations from the Airport.

The Airport maintains an ASD Five-Year Plan which is updated regularly based on market and socio-economic factors. The plan includes a forecast of domestic and international destinations for services that have already been retained and those targeted by the Airport and community stakeholders. The targeted markets for domestic service are based on historical trends for the Airport's largest O&D markets that currently do not have nonstop service. In addition, two of the target markets (Washington National Airport and LaGuardia Airport) are restricted by a maximum number of daily slots and maximum flight distances. As a result, the ASD Five-Year Plan does not anticipate nonstop service to these markets until the latter part of the five-year period.

3.2.12 COMMERCIAL PASSENGER TRAFFIC FORECAST METHODOLOGY

Figure 3.2-16 lists the key features of the hybrid forecasting framework and the various sources of data used in commercial passenger traffic forecast development**.**

Figure 3.2-16: Commercial Passenger Activity Forecast Modeling Techniques and Data Sources

Modeling Techniques

- Hybrid forecasting framework
- Bottom-up forecasting using airline schedules
- Multivariate time series regression analysis
- Post-modeling adjustments for air service development
- Scenario development
- Monte Carlo simulation

Data Sources

- Airport records
- Airline flight schedules
- Online airline fleet data sources
- U.S. DOT's BTS data sources
- Federal Aviation Administration databases and publications
- U.S. Bureau of Census
- U.S. Bureau of Labor Statistics
- U.S. Bureau of Economic Analysis
- Moody's Analytics

Source: Unison Consulting, Inc.

The forecast for the first year (FY 2018) considers actual performance through April 2018 and published airline flight schedules. Published airline flight schedules are based on passenger bookings and therefore reflect near-term market demand. The FY 2018 flight schedules also establish the baseline data on commercial aircraft operations and fleet mix.

Beyond the first year, forecasts are demand-driven. Multivariate regression analysis links growth in enplanements to trends in market demand factors. It provides a systematic framework for quantifying the contributions of different factors to airport enplanements and generating enplanement forecasts based on the projected trends in key market demand factors. Forecast enplanements, in turn, serve as the basis for projecting aircraft operations and corresponding landed weight, along with assumptions on trends in boarding load factors and changes in aircraft fleet composition. Available seats and landed weights are determined by the forecast fleet mix and the corresponding seating capacity and landing weight, respectively, of each equipment type. Post-modeling adjustments were made to account for the incremental traffic resulting from new service additions in FY 2019 to FY 2023 anticipated in SAT's Five-Year Air Service Development Plan.

REGRESSION MODEL EXPLANATORY VARIABLES

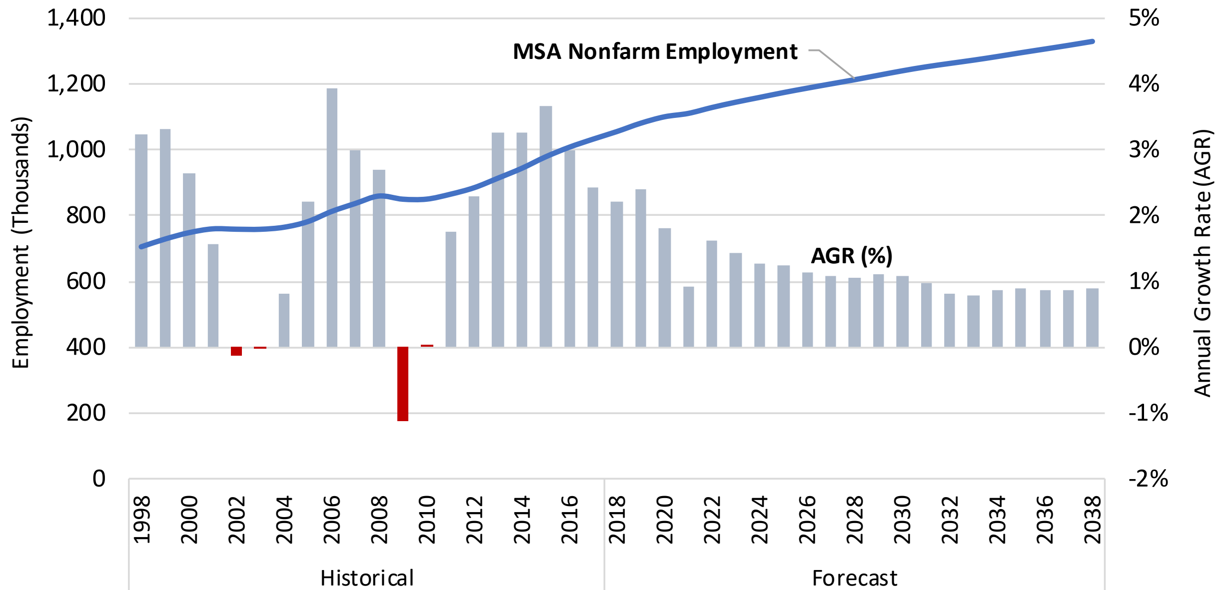
The regression model includes the following explanatory variables, which were selected based on the underlying theory of air travel demand and the dynamics of traffic growth in the San Antonio-New Braunfels, TX Metropolitan Statistical Area (San Antonio-New Braunfels MSA).

REGIONAL ECONOMIC TRENDS

Nonfarm employment for the San Antonio-New Braunfels MSA is used to indicate overall trends in the region's economy, including trends in population, labor force, and income. Holding all other factors constant, growth in regional employment promotes growth in airport enplanements while decreases in employment inhibit growth in enplanements.

Reflecting the SAT Air Trade Area's fast-growing population and improving economic conditions, the San Antonio-New Braunfels MSA's nonfarm employment growth has been strong and steady over the past seven years (**Figure 3.2-17**). Jobs in the metro area increased at annual average rate of 2 percent between 1998 and 2008, from approximately 71,000 to 86,000. They decreased 1.1 percent in 2009, during the Great Recession, and levelled off at 85,000 in 2010. Employment growth has since resumed at an average annual rate of nearly 3 percent through 2017, surpassing 1 million jobs since 2016. According to Moody's Analytics' economic forecast, employment growth in the San Antonio metropolitan area will continue at annual average rate of 1.2 percent with total employment reaching 1.3 million in 2038. The rate of employment growth projected for San Antonio outpaces the rate of employment growth projected for the entire country (0.6 percent).

Figure 3.2-17: San Antonio-New Braunfels Metropolitan Statistical Area Nonfarm Employment (Fiscal Years 1998-2038)



Sources: U.S. Bureau of Economic Analysis, Moody's Analytics, and Unison Consulting, Inc.

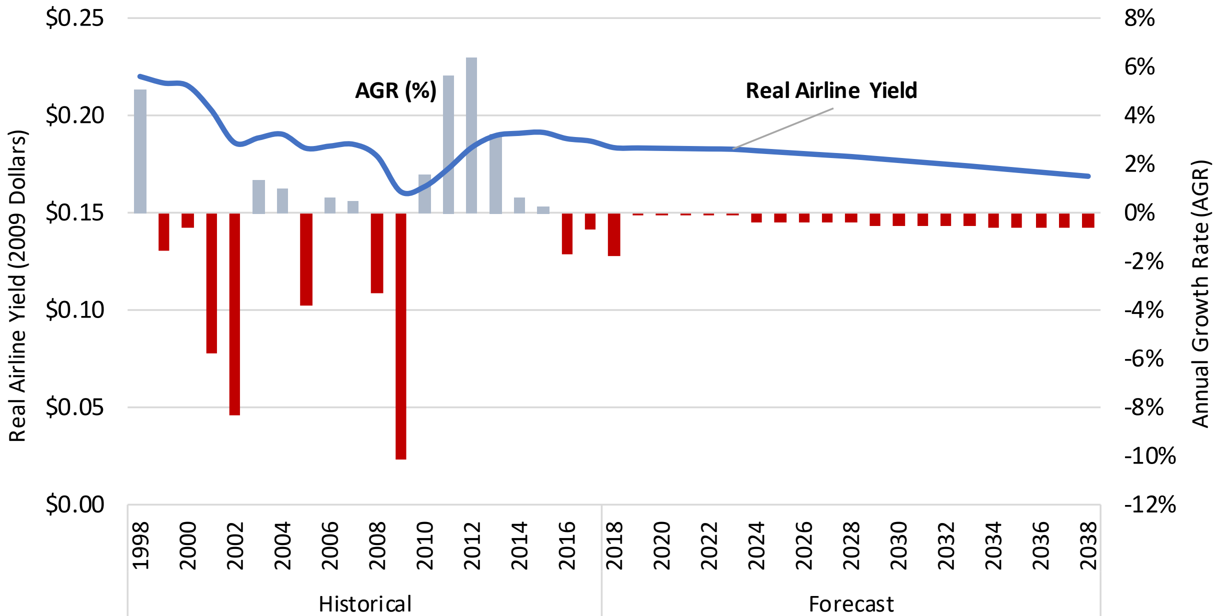
AIRLINE YIELD TRENDS

Consumer demand is inversely related to price. Demand increases when price decreases, and decreases when price increases, holding all other factors constant. Average airline yield is used to represent the price of air travel. Airline yield, measured as the average revenue per passenger mile to the airlines, is a better price indicator than the average fare, because it controls for trip distance. Demand theory suggests an inverse relationship between demand and price. Demand rises when price decreases and falls when price increases, holding all other factors constant.

According to data from the U.S. DOT DB1B Survey (10-percent ticket survey), the average real airline yield at SAT decreased nearly 30 percent between 1998 and 2009, from $0.22 to $0.16 (in 2009 U.S. dollars). Then it increased steadily for six years to $0.19 in 2015. In recent years, the trend in SAT's average real airline yield followed national trends, as it decreased 2.3 percent each year in 2016 and 2017. For the Master Plan forecast, the future trends in SAT's real airline yield are assumed to follow the FAA's projections for real domestic mainline passenger yields. The FAA projects continued decreases, averaging around 0.3 percent annually (**Figure 3.2-18**).[4]

[4] Federal Aviation Administration, Aerospace Forecast for FY2018-2038, March 2018.

Figure 3.2-18: SAT Real Airline Yield (2009 Dollars) (Fiscal Years 1998-2038)



Note: SAT – San Antonio International Airport

Sources: US Department of Transportation DB1B, Federal Aviation Administration, and Unison Consulting, Inc.

AIRPORT COMPETITION

To account for competition from AUS, the regression model includes two variables measuring fare differences and differences in the number of connections of flight itineraries to market destinations (overlapping markets) served from both airports (**Table 3.2-3**).

The variable measuring fare differences is specified as the ratio of SAT's average passenger yield to AUS' average passenger yield. This ratio increased from 0.88 in the early 1990's to more than 1.00 beginning in FY 2003. It continued to increase to 1.12 in 2017, meaning that fares from SAT, controlling for stage length, are on average 12 percent higher than fares from AUS to the same destinations. The base forecast holds this ratio of 1.12 constant throughout the forecast period—meaning that the relative fare differential between SAT and AUS will remain the same throughout the forecast period. A ratio greater than 1.0 indicates a competitive disadvantage for SAT.

The second variable is intended to capture differences in air service quality, passenger travel time, and passenger convenience. It is the ratio of the average number of connections passengers make on flights from SAT to the average number of connections passengers make on flights from AUS to overlapping markets. In calculating this ratio, nonstop itineraries are counted as having one connection. The average number of connections is passenger-weighted, such that connections on flight itineraries to busier markets are given more weight than connections on flights itineraries to thin markets. During the period from 1998 to 2007, passengers flying from SAT made up to 4 percent more connections, on average, than passengers flying from AUS to the same market destinations. This ratio increased to 1.10 during the last 10 years, indicating that SAT passengers have been making 10 percent more connections than AUS passengers on overlapping markets since 2008. The base forecast holds this ratio constant at 1.10 throughout the forecast period, meaning that SAT's competitive disadvantage over AUS will continue.

Table 3.2-3: SAT and AUS Comparison Metrics on Overlapping Markets (Fisca Year 2017)

	SAT	AUS	% DIFFERENCE
Average Airline Yield	$0.19	$0.17	-12%
Average Connections*	1.53	1.39	-10%

Notes:

* Nonstop itineraries count as having 1 connection.

AUS - Austin–Bergstrom International Airport

SAT – San Antonio International Airport

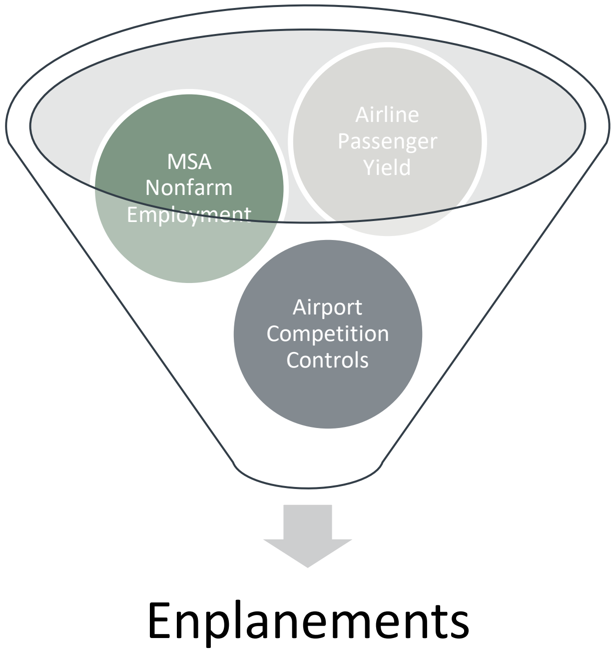
Source: Official Airline Guide Schedules Analyzer, U.S. DOT DB1B and Unison Consulting, Inc.

POST-SEPTEMBER 11, 2001 STRUCTURAL CHANGES

The regression model includes a variable that accounts for structural changes in the travel industry since the terrorist attacks on September 11, 2001. More stringent airport security screening after the terrorist attacks dampened air travel demand, particularly short-haul trips. Traffic decreases and fuel cost increases prompted changes in airlines' operations and business practices, including capacity rationalization, network consolidation, pricing changes, and cost-cutting measures. Financial difficulties led to bankruptcies, industry exits, and mergers.

Figure 3.2-19 shows the market demand drivers that best explain the growth trends in enplanements at the Airport. The measured contributions (coefficient estimates) of all the explanatory variables are consistent with theory and expectations. The coefficient estimate for the San Antonio-New Braunfels MSA nonfarm employment has the expected positive sign and is statistically significant. The coefficient estimates for airline yield and the airport competition controls are negative as expected and are statistically significant. Calibrated with the coefficient estimates, the regression equation is used to project organic growth in enplanements at the Airport based on the projected future values of the explanatory variables.

Figure 3.2-19: Key Drivers of Enplanement Growth



Source: Unison Consulting, Inc.

POST-MODELING ADJUSTMENTS FOR AIR SERVICE DEVELOPMENT INITIATIVES

The City of San Antonio Department of Aviation has identified targets for new non-stop service additions for FY 2019 to FY 2023 (**Table 3.2-4**). Post-modeling adjustments accounted for the incremental passenger traffic resulting from these new service additions under two scenarios. The first scenario, designated as the "Master Plan" forecast, assumes that only one-half of these new service targets will be realized. The second scenario, designated as "High Growth", assumes that all of the new service targets will be realized.

Table 3.2-4: Air Service Development Targets for Fiscal Years 2019 - 2023

Weekly Frequency					
Domestic 5-Year Forecast					
Destination	**2019**	**2020**	**2021**	**2022**	**2023**
DCA					7
BOS	7	7	7	7	14
LGA				7	7
SMF		7	7	14	14
IND	5	5	7	7	7
PDX	3	5	5	7	7
MKE		4	4	4	4
ORF				3	3
PIT				3	3
BDL			2	2	2
SJU	2	2	3	3	4
International 5-Year Forecast					
Destination	**2019**	**2020**	**2021**	**2022**	**2023**
Europe	3	3	5	5	7
Latin America		3	3	5	7
Western Canada		3	3	7	7

Source: San Antonio Aviation Department.

3.2.13 COMMERCIAL PASSENGER TRAFFIC FORECAST RESULTS

Table 3.2-5 and **Figure 3.2-20** presents forecast enplanements recommended for the Master Plan forecast and the High Growth forecast. The scenarios underlying the Master Plan forecast and High Growth forecast are described below:

- **Master Plan:** Organic growth in SAT enplanements would proceed based on: (1) the growth in scheduled seat capacity at SAT in for the remainder of FY 2018 and (2) the most likely trends for the market demand drivers (i.e. regional economy and passenger yield). SAT's competitive position relative to AUS would remain at status quo. The Department of Aviation would realize 50 percent of its new service targets under its Air Service Development Plan. Under the Master Plan forecast, enplanements will increase from an estimated 4.9 million in 2018 to 7.2 million in 2038, growing at an average annual rate of 2.0 percent.
- **High Growth (Aggressive Air Service Development):** Organic growth in SAT enplanements would proceed based on: (1) the growth in scheduled seat capacity at SAT in 2018 and (2) the most likely trends for the market demand drivers (i.e. regional economy and passenger yield). Continued success with air service development efforts would stimulate airline competition and improve the quality of air service at SAT so that SAT would gradually achieve parity with AUS on air fares and air service quality measures—the ratios of relative passenger yields and number of connections would gradually decrease to 1 by FY 2038. Under the High Growth forecast,

enplanements will increase from an estimated 4.9 million in 2018 to 8.3 million in 2038, growing at an average annual rate of 2.7 percent.

Table 3.2-5: Forecast Enplanements (in Thousands) (Fiscal Years 2008-2038)

	Actual	Est.	Forecast			Compound Annual Growth Rate			
Scenario	**2017**	**2018**	**2023**	**2028**	**2038**	**2018-2023**	**2023-2028**	**2028-2038**	**2018-2038**
Master Plan (MP)	4,432	4,873	5,731	6,283	7,234	3.3%	1.9%	1.4%	2.0%
Domestic	4,180	4,650	5,410	5,931	6,829	3.1%	1.9%	1.4%	1.9%
International	251	223	322	352	404	7.6%	1.8%	1.4%	3.0%
High Growth (HG)	4,432	4,873	5,891	6,759	8,349	3.9%	2.8%	2.1%	2.7%
Domestic	4,180	4,650	5,560	6,380	7,882	3.6%	2.8%	2.1%	2.7%
International	251	223	331	379	467	8.2%	2.8%	2.1%	3.8%
TAF	4,300	4,664	5,184	5,608	6,618	2.1%	1.6%	1.7%	1.8%
Adjusted TAF	4,432	4,873	5,342	5,778	6,820	1.9%	1.6%	1.7%	1.7%
Ratio MP-TAF	1.03	1.04	1.11	1.12	1.09				
Ratio MP-Adjusted TAF	1.00	1.00	1.07	1.09	1.06				
Ratio HG-Adjusted TAF	1.00	1.00	1.10	1.17	1.22				

Note: Estimated enplanements in 2018 are based on scheduled seats at SAT.

Sources: Airport Statistics, U.S. Department of Transportation, Official Airline Guide Schedules Analyzer, and Unison Consulting, Inc.

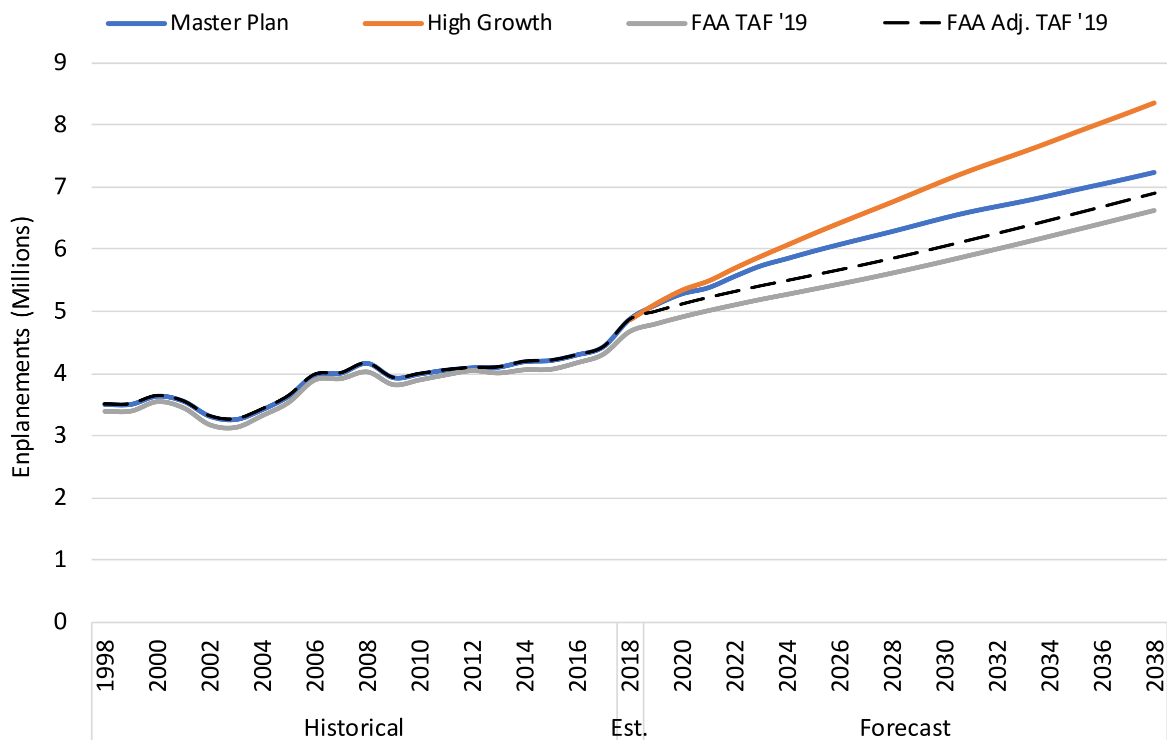
Under both the Master Plan and High Growth forecasts, domestic traffic would continue to predominate SAT enplanements, although international enplanements would be growing at a faster rate than domestic enplanements.

Table 3.2-5 and Figure 3.2-20 compares the Master Plan forecast enplanements to the FAA's Terminal Area Forecast (TAF) for SAT, as published and adjusted to reflect actual enplanements in 2017, actual enplanements during the first seven months of FY 2018 (through April 2018), and estimated enplanements for the remainder of FY 2018 based on scheduled seats (Adjusted TAF). Beyond 2018, the Adjusted TAF enplanements grow at the same pace as the published TAF. The Master Plan forecast enplanements are within 12 percent of the published TAF and within 9 percent of the Adjusted TAF over the 20-year forecast period.

Monte Carlo simulation was performed to quantify the effect of uncertainty in the future trends of key market drivers. A comprehensive approach to forecast risk analysis, Monte Carlo simulation uses probability distributions and random sampling techniques for assigning future values to the key explanatory variables of the regression model. The simulation, involving 5,000 iterations, produces a range of possible scenarios for future enplanement growth driven by trends in the market demand drivers. It also produces a percentile ranking of forecast results. Percentiles provide an indication of the likelihood of each forecast.

Figure 3.2-21 shows the Master Plan forecast along with select Monte Carlo simulation results for SAT enplanements. The Monte Carlo simulation results represent the full range of unconstrained air travel demand the market can support given all the possible trends for the key market drivers (i.e. regional economy and passenger yield). The airport competition controls remain at status quo, as assumed in the Master Plan's base scenario. The median forecast represents unconstrained air travel demand supported by the most likely trends in the key market drivers, and the forecasts above (below) the median represent unconstrained air travel demand supported by more (less) favorable trends in the key market drivers.

Figure 3.2-20: Historical and Forecast Total Enplanements



Notes:

Adj. - Adjusted

Est. - Estimated

FAA TAF – Federal Aviation Administration Terminal Area Forecast

Sources: Airport statistics (historical data), Federal Aviation Administration (Terminal Area Forecast), and Unison Consulting, Inc. (base and high forecast results).

The Master Plan forecast is closest to the 75-percentile results of the Monte Carlo simulation through most of the forecast period. However, after 2023, it grows slightly slower than the 75-percentile results and tapers toward the median results, which lie below the Master Plan forecast and above the FAA's adjusted TAF. The High Growth forecast is within 2 percent of the 75-percentile results through 2022. It then increases steadily to approach the 95-percentile results in the late 2020's, and grows slightly above the 95-percentile results after 2031.

Interpretation of Percentiles

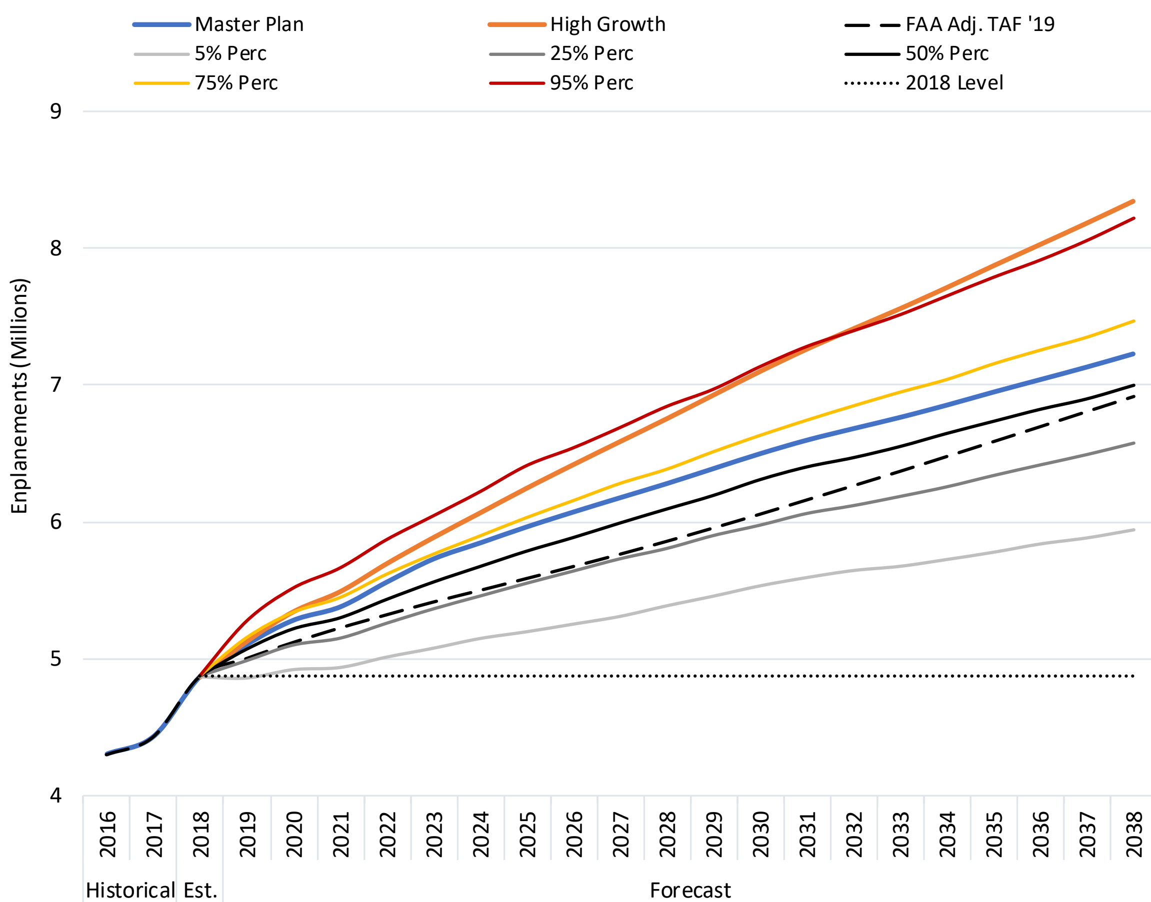
A percentile indicates the value at or below which a given percentage of results fall. For example, if we arrange 100 forecast results for one year from lowest to highest, 25 results (25 percent) will be at or below the 25-percentile, 75 results (75 percent) will be at or below the 75-percentile, and 50 results (50 percent) will be at or below the 50-percentile (also known as the median). A percentile gives the probability that actual outcome will be as forecast or lower.

The following examples illustrate how the percentile results can be used to indicate forecast probability:

- The 75-percentile results have a 25 percent probability that actual enplanements will exceed the forecast and a 75 percent probability that actual enplanements will be at or below the forecast.
- The 25-percentile results have a 75 percent probability that actual enplanements will exceed the forecast and a 25 percent probability that actual enplanements will be at or below the forecast.

The range of forecasts bounded by the 25-percentile and the 75-percentile is called the interquartile range—the

Figure 3.2-21: Forecast Total Enplanements with Monte Carlo Simulation Results



Sources: Airport statistics for historical data, FAA for the TAF, and Unison Consulting, Inc. for the forecast results.

The forecast annual enplanement levels provide the basis for projecting passenger aircraft operations, along with projections of fleet mix by airline, the number of seats by equipment, and boarding load factors. **Table 3.2-6** shows the corresponding forecast passenger aircraft operations:

- **Master Plan**: Passenger aircraft operations increase from 87,330 in 2018 to 120,186 in 2038 at an average annual rate of 1.6 percent.
- **High Growth**: Passenger aircraft operations increase from 87,330 in 2018 to 138,033 in 2038 at an average annual rate of 2.3 percent.

Passenger aircraft operations grow at a slower pace than enplanements, reflecting an increase in the average number of enplanements per aircraft departure resulting from an increase in the average number of seats per aircraft departure from 138 in 2017 to 151 in 2038 and an increase in the average boarding load factor from 76.5 percent in 2017 to 79.9 percent in 2038.

Table 3.2-6: SAT Forecast Commercial Passenger Aircraft Operations

	Actual	Est.	Forecast			Compound Annual Growth Rate			
Scenario	**2017**	**2018**	**2023**	**2028**	**2038**	**2018-2023**	**2023-2028**	**2028-2038**	**2018-2038**
Master Plan (MP)	84,180	87,330	98,288	105,825	120,186	2.4%	1.5%	1.3%	1.6%
High Growth (HG)	84,180	87,330	101,030	113,587	138,033	3.0%	2.4%	2.0%	2.3%

Note: Est. - Estimated

Sources: Airport Statistics, U.S. DOT, Official Airline Guide Schedules Analyzer, and Unison Consulting, Inc.

The forecast passenger aircraft operations are the basis for the forecast passenger aircraft landed weight in **Table 3.2-7**. The forecast landed weight increases at a slightly faster rate than operations, reflecting continued fleet upgauging:

- **Master Plan**: Passenger aircraft landed weight increases from 5.4 million pounds in 2018 to 7.7 million pounds in 2038 at an average annual rate of 1.7 percent.
- **High Growth**: Passenger aircraft landed weight increases from 5.4 million pounds in 2018 to 8.8 million pounds in 2038 at an average annual rate of 2.4 percent.

Table 3.2-7: SAT Forecast Commercial Passenger Aircraft Landed Weight (1,000 Pounds)

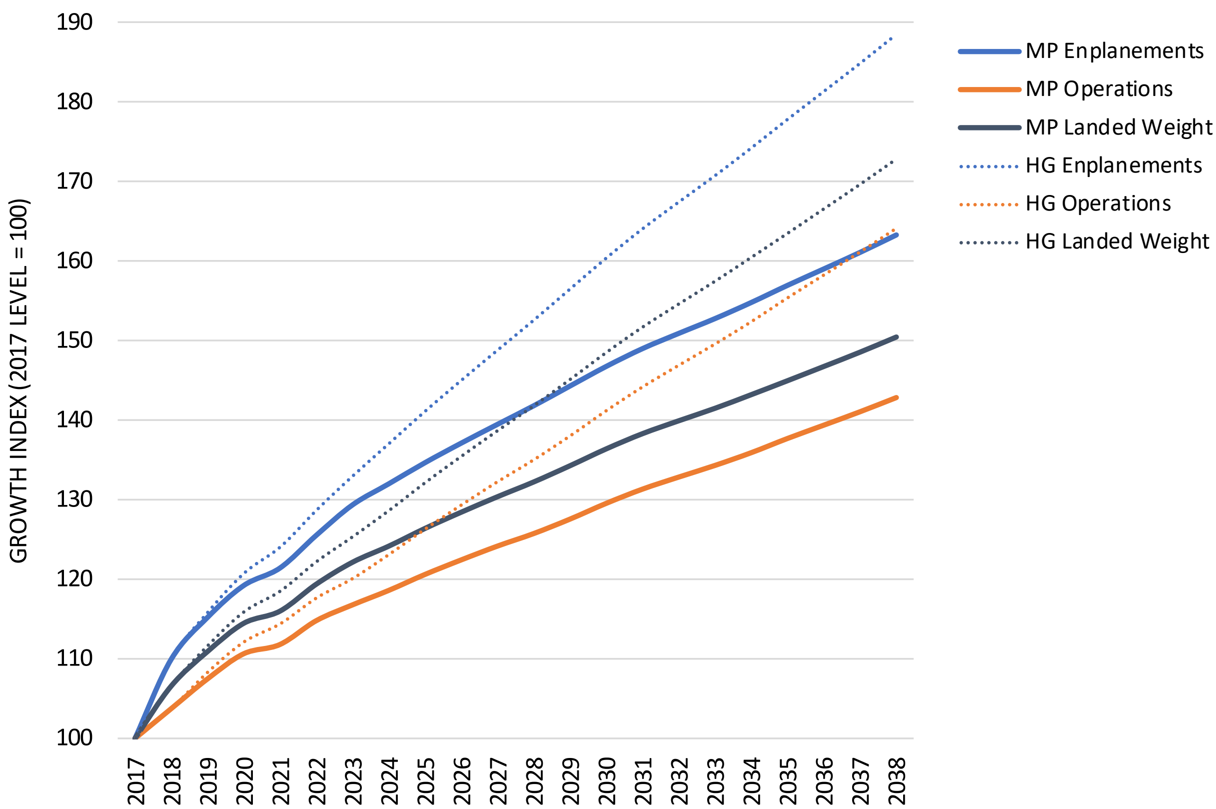
	Actual	Est.	Forecast			Compound Annual Growth Rate			
Scenario	**2017**	**2018**	**2023**	**2028**	**2038**	**2018-2023**	**2023-2028**	**2028-2038**	**2018-2038**
Master Plan (MP)	5,103	5,439	6,234	6,750	7,680	2.8%	1.6%	1.3%	1.7%
High Growth (HG)	5,103	5,439	6,394	7,235	8,817	3.3%	2.5%	2.0%	2.4%

Note: Est. - Estimated

Sources: Airport Statistics, U.S. DOT, Official Airline Guide Schedules Analyzer, and Unison Consulting, Inc.

Figure 3.2-22 compares the forecast growth trends in enplanements, aircraft operations, and landed weight. Compared with enplanements, aircraft operations and landed weight grow at a slower pace because of continuing efforts by airlines to improve load factors and upgauge their fleet. Compared with aircraft operations, landed weight grows at a slightly faster pace due to fleet upgauging within both the narrow-body and regional jet aircraft groups.

Figure 3.2-22: Forecast Growth Trends in Enplanements, Aircraft Operations, and Landed Weight



Notes:

HG – High Growth forecast scenario

MP – Master Plan forecast scenario

Sources: U.S. Department of Transportation (historical data), Unison Consulting, Inc., (forecasts).

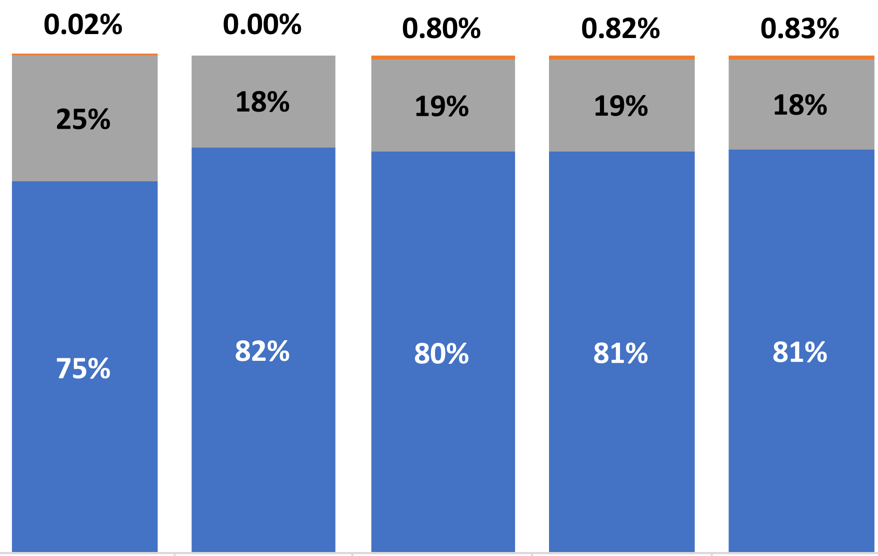
FLEET MIX FORECASTS

Figure 3.2-23 shows the composition of the passenger aircraft fleet serving SAT. Narrow-body jets accounted for the majority of aircraft operations in 2017 (75 percent) and are projected to increase just above 80 percent over the Master Plan forecast period. Regional jets accounted for most of the remaining share of aircraft operations in 2017 and are forecast to decrease to approximately 18 percent through the forecast period. The shift in the fleet mix from regional jet to narrow-body is due to the fast growth in scheduled service at SAT, operated primarily by narrow-body aircraft. Following national trends, the forecast growth in regional jet activity is primarily driven by large regional aircraft. Small regional jets (50 seats or less) are phased out early in the forecast period. Carriers serving SAT currently do not operate any wide-body jet aircraft at the Airport.[5] The Air Service Development Plan, however, include European markets that will be served by foreign-flag carriers beginning in 2019.

[5] In previous years, United Airlines operated some flights using a wide-body Boeing 767-400 jet aircraft.

The forecast assumes that a wide-body Boeing 787-900 will operate on the planned service to Europe. The fleet mix projections consider the age of specific aircraft used by each airline at SAT, the types and age of other aircraft in each airlines' fleet, and expected new aircraft deliveries. Assuming a 30-year useful life, older aircraft are phased out and replaced by newer, similar aircraft in an airline's fleet.

Figure 3.2-23: Commercial Passenger Forecast Fleet Mix (Aircraft Operations Shares by Aircraft Group)



	2017	2018	2023	2028	2038
Wide-body	16	0	768	843	971
Regional Jet	21,192	15,986	17,832	19,035	21,117
Narrow-body	62,078	70,460	76,772	82,877	94,718

Sources: Official Airline Guide Schedules Analyzer and Unison Consulting, Inc.

PEAK MONTH AVERAGE DAY PEAK HOUR AIRCRAFT OPERATIONS AND PASSENGERS

Table 3.2-8 shows the calculations for the peak month average day (PMAD) peak hour number of aircraft operations for commercial passenger carriers. July is typically the peak month for passenger aircraft operations, accounting for 9.1 percent of operations in the fiscal year. In July 2018, 8.3 percent of passenger aircraft operations during the average day took place during the peak hour. This PMAD peak hour percentage of passenger aircraft operations is expected to decrease slightly over the forecast period, as airlines continue to spread their operations throughout the day (a practice called peak spreading).

Table 3.2-8: Peak Month Average Day Peak Hour Aircraft Operations

	Estimate	Forecast		
Scenario	**2018**	**2023**	**2028**	**2038**
Master Plan (MP)	**87,300**	**98,300**	**105,800**	**120,200**
Peak Month (9.1% of FY Total)	7,900	8,900	9,600	10,900
Peak Month Average Day (PMAD)	255	287	310	352
PMAD Peak Hour (% of PMAD Subtotal)	8.3%	8.2%	8.2%	8.1%
PMAD Peak Hour	21	24	25	29
High Growth (HG)	**87,300**	**101,000**	**113,600**	**138,000**
Peak Month (9.1% of FY Total)	7,900	9,200	10,300	12,600
Peak Month Average Day (PMAD)	255	297	332	406
PMAD Peak Hour (% of PMAD Subtotal)	8.3%	8.2%	8.2%	8.1%
PMAD Peak Hour	21	24	27	33

Note: Annual aircraft operations and peak month aircraft operations are rounded to the nearest hundred.

Sources: Official Airline Guide Schedules Analyzer and Unison Consulting, Inc

Table 3.2-9 shows the calculations for the peak month average day (PMAD) peak hour number of passengers. The peak month for passenger traffic is also July, accounting for 9.5 percent of fiscal year total passenger enplanements over the past five years. The peak hour for passenger traffic is expected to be consistent with the peak hour for total seats on all passenger aircraft operations (arrivals and departures), although the peak hour share of the PMAD total passenger traffic is estimated to be higher than the peak hour share of PMAD total seats to account for higher boarding load factors during peak periods. The PMAD peak hour share of passenger traffic is estimated at 15.4 percent in 2018 and is projected to decline slightly over the forecast period due to peak spreading.

Table 3.2-9: Peak Month Average Day Peak Hour Passengers

	Estimate	Forecast		
Scenario	**2018**	**2023**	**2028**	**2038**
Master Plan (MP)	**9,745,100**	**11,462,600**	**12,566,400**	**14,467,600**
Peak Month (9.5% of FY Total)	925,800	1,088,900	1,193,800	1,374,400
Peak Month Average Day (PMAD)	29,865	35,126	38,510	44,335
PMAD Peak Hour (% of PMAD Subtotal)	15.4%	15.3%	15.3%	15.2%
PMAD Peak Hour	4,599	5,390	5,895	6,755
High Growth (HG)	**9,745,100**	**11,781,600**	**13,517,700**	**16,697,100**
Peak Month (9.5% of FY Total)	925,800	1,119,300	1,284,200	1,586,200
Peak Month Average Day (PMAD)	29,865	36,106	41,426	51,168
PMAD Peak Hour (% of PMAD Subtotal)	15.4%	15.3%	15.3%	15.2%
PMAD Peak Hour	4,599	5,541	6,341	7,796

Note: Annual passengers and peak month passengers are rounded to the nearest hundred.

Sources: Official Airline Guide Schedules Analyzer and Unison Consulting, Inc.

3.3 AIR CARGO TRAFFIC

Texas's multimodal freight transport system covers a vast network of highways, rail lines, pipelines, waterways, sea ports and airports. As a leader in maritime commerce, nearly half of the state's 11 seaports rank among the U.S. top-20 busiest complexes in terms of annual tonnage (Houston – 2nd, Beaumont – 5th, Corpus Christi – 6th, Texas City – 15th, and Port Arthur – 20th).[6] Maritime activity in Texas is complemented by air cargo aircraft operations at airports across the state. Four Texas hubs rank in the U.S. top-40 airports in terms of landed cargo weight, including DFW (9th), IAH (19th), Fort Worth Alliance Airport (AFW) (31st) and SAT (33rd).[7] These airports are important air cargo gateways for time-sensitive, high-value consumer and commercial goods. DFW and AFW also serve as key regional hubs to the world's largest integrated cargo carriers, UPS Airlines and FedEx Express, respectively. **Figure 3.3-1** shows the tonnage and value composition of the various modes used to transport goods in Texas. The figure also shows the modal shares of export and import commodities that move through the state's port facilities. Although air cargo accounts for a small share of the transported freight tonnage in Texas, it accounts for a sizable share of the total value of transported goods, particularly international trade commodities.

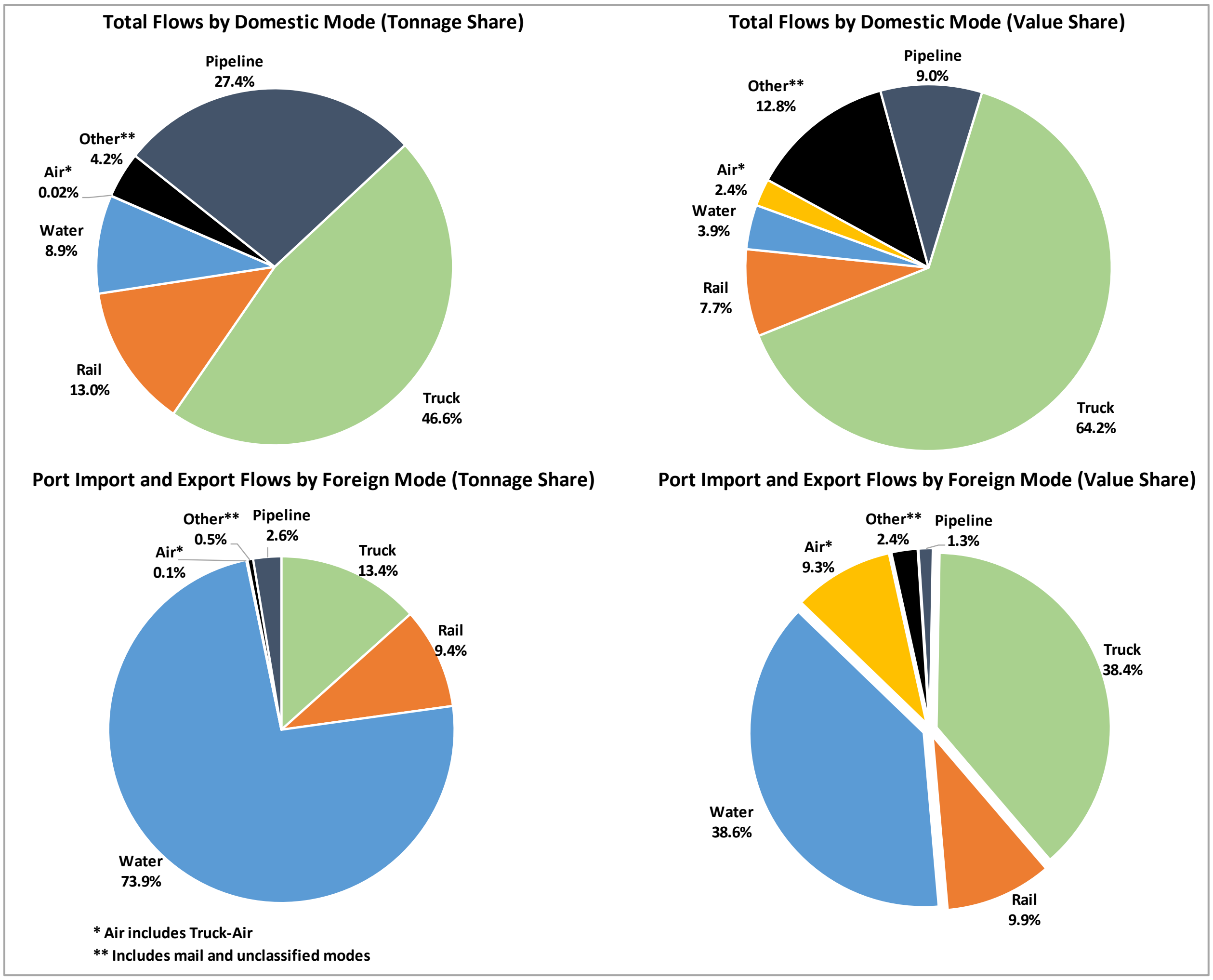
Air cargo aircraft operations are also an important driver of San Antonio's regional economy. A study by GRA, Inc. on the economic impacts of the San Antonio Airport System showed that air cargo aircraft operations, in 2011, accounted for 8 percent of the direct jobs supported by aviation activity at SAT, while contributing nearly $27 million in earnings and $192 million in direct economic output to the region. Combined with other sectors of the aviation system—including aircraft maintenance and repair, commercial passenger service, and charter service—the indirect and induced impacts of total aviation activity at SAT raised the airport's contribution to the local economy to nearly 98,000 jobs, $1.6 billion in earnings and $5 billion in economic output.[8] The tourism industry, supported by SAT's air services, has traditionally played an important role in San Antonio's regional economy. Other sectors, including information technology, cyber security, healthcare, biosciences, manufacturing and aerospace, have demonstrated strong growth in the San Antonio metropolitan area. SAT's air cargo services have direct impacts on these growing industries, which typically require expedited transport of high-value or perishable goods.

[6] Seaport rankings for 2016 are obtained from U.S. Army Corps of Engineers (retrieved August 2018).

[7] Federal Aviation Administration, Cargo Landed Weight, 2017 preliminary data.

[8] Economic Impact of the San Antonio Airport System. Report prepared by GRA, Incorporated. Economic Counsel to the Transportation Industry. May 2012. This study is being updated as part of the Master Plan.

Figure 3.3-1: Freight Flows in Texas by Mode (2016)



Sources: U.S. Department of Transportation Bureau of Transportation Statistics and Federal Highway Administration Freight Analysis Framework V.4.

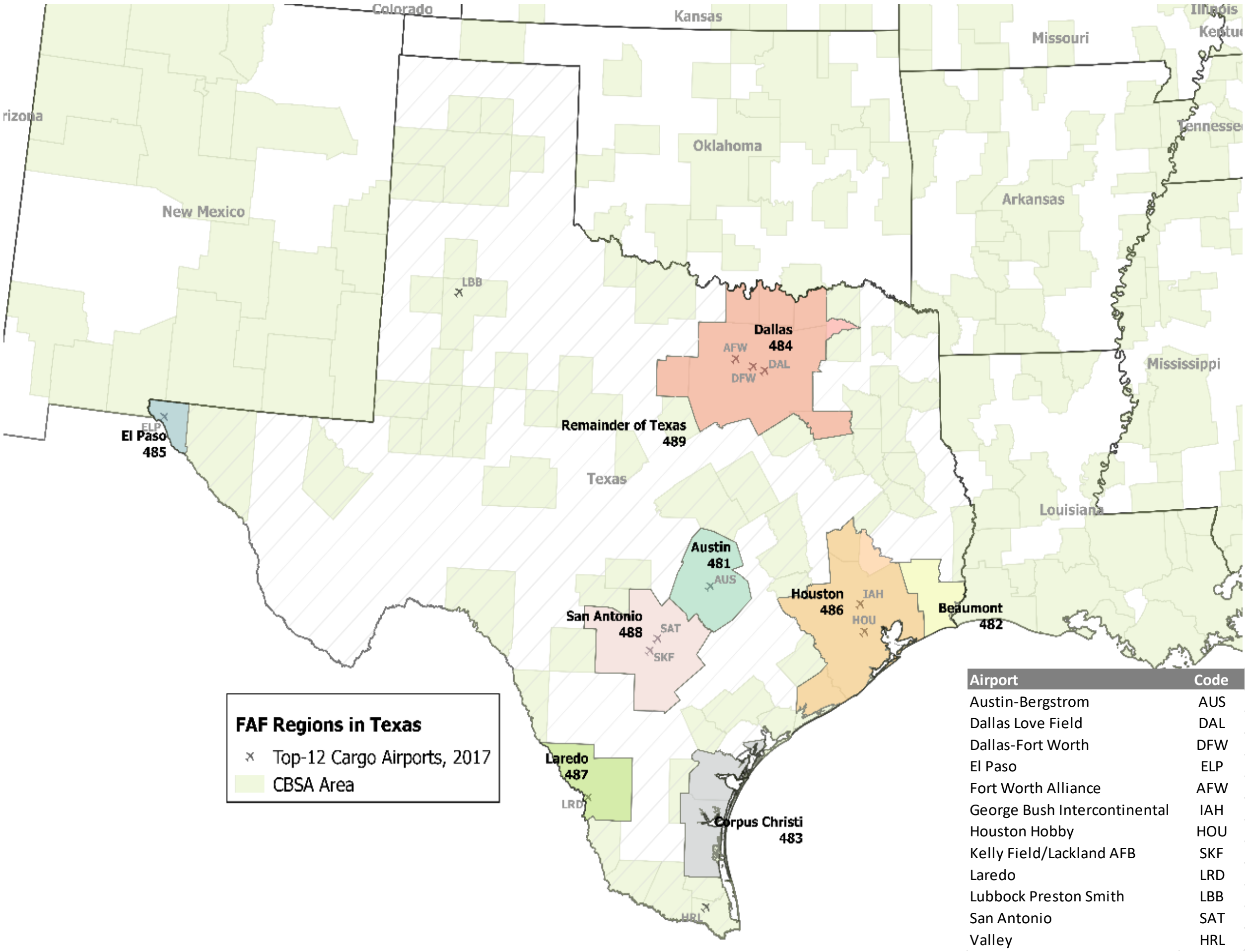
3.3.1 FREIGHT ANALYSIS FRAMEWORK

Regional freight data obtained from the Freight Analysis Framework (FAF) database can be used to gain insights into the characteristics of goods transported by air in the San Antonio region. **Figure 3.3-2** shows how the Commodity Flow Survey and FAF define freight regions in Texas, following the Office of Management and Budget's delineation of core-based statistical areas (CBSA). Since SAT is the primary airport with substantial commercial air cargo service for the San Antonio FAF region (region 488 on the map), FAF's regional data can be used to understand the composition of air cargo commodities that are flown to and from SAT.[9]

The **Freight Analysis Framework (FAF)** is a database prepared by U.S. BTS and Federal Highway Administration. FAF's baseline data are constructed from the Census Bureau's international trade data and the BTS Commodity Flow Survey (CFS) data, which are based on surveys given to shippers every 5 years along with the Economic Census. The FAF database also integrates data from various industry sources – including agriculture, energy and utility, construction, extraction, service – to construct a comprehensive account of goods movement among states and metropolitan areas by all modes of transportation. Based on macroeconomic, regional, inter-industry, and intra-state forecast models, FAF also provides forecasts of freight activity in 5-year intervals up to the year 2045. FAF's freight forecasts rely on inputs from IHS's U.S. Macro Model, Business Market Insights, Business Transactions Matrix, World Trade

9 Note that the FAF region for San Antonio is the same as the eight-county San Antonio–New Braunfels MSA.

Figure 3.3-2: Texas Freight Analysis Framework Regions and Top-12 Cargo Airports



Sources: Unison Consulting, Inc. using data from U.S. Department of Transportation National Transportation Atlas Database (NTAD) and U.S. DOT BTS T-100 Segment Data.

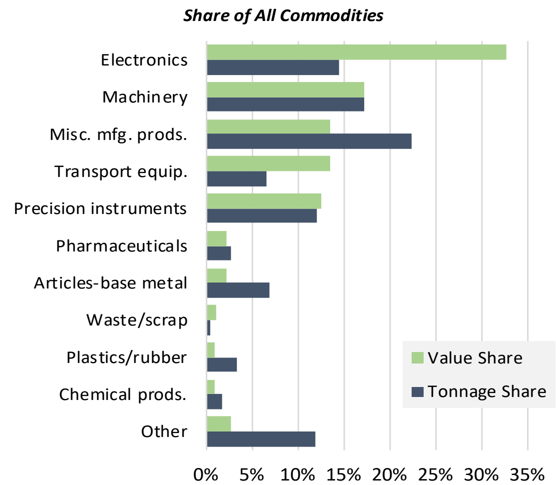
3.3.2 AIR CARGO COMMODITIES TRANSPORTED IN THE SAN ANTONIO REGION

Table 3.3-1 shows that electronics were the most valuable commodities shipped as air cargo from San Antonio, accounting for an estimated 33 percent of the total value of air cargo goods leaving the region in 2016. Goods classified as machinery, miscellaneous manufacturing products, and transportation equipment were the second, third and fourth most valuable goods shipped as air cargo, respectively, valuing in total between $173 million and $221 million. Miscellaneous manufacturing products also made up the largest share of outbound cargo tonnage, accounting for nearly a quarter of the shipped weight from the region.

The FAF exports data for 2016 reveal that electronics and precision metals were the most valuable commodities exported from San Antonio as international air cargo. Electronics accounted for 43 percent of all export product values and precision instruments accounted for 20 percent of all export product values. Mexico was San Antonio’s top export destination of air cargo goods in 2016, accounting for nearly all of the exported goods by value (95 percent). The value of air cargo commodities destined to Europe and Eastern Asia made up 3 percent and 1 percent, respectively.

Table 3.3-1: San Antonio Outbound Air Cargo - Top 10 Commodities by Value (2016 Estimates)

Rank	Top-10 Commodities	Value in 2016$ (Millions)	Tons (Thousands)
1	Electronics	418.96	2.20
2	Machinery	220.73	2.63
3	Misc. mfg. prods.	173.84	3.42
4	Transport equip.	172.59	1.01
5	Precision instruments	160.35	1.83
6	Pharmaceuticals	29.44	0.42
7	Articles-base metal	28.04	1.05
8	Waste/scrap	15.09	0.08
9	Plastics/rubber	13.04	0.52
10	Chemical prods.	12.51	0.27
	Other	35.35	1.80
	All Commodities	1,279.93	15.24

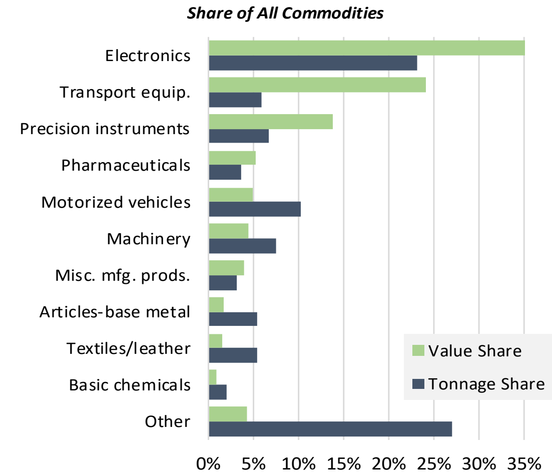


Sources: U.S. Department of Transportation Bureau of Transportation Statistics and Federal Highway Administration Freight Analysis Framework Version 4; Compiled by Unison Consulting, Inc.

Inbound air cargo shipments to the San Antonio region are primarily comprised of electronics, both in terms of value and tonnage (**Table 3.3-2**). The total value of electronics flown to the region was nearly $1 billion in 2016, followed by transportation equipment and precision instruments, which accounted for over $600 million and $350 million, respectively.

Table 3.3-2: San Antonio Inbound Air Cargo - Top 10 Commodities by Value (2016 Estimates)

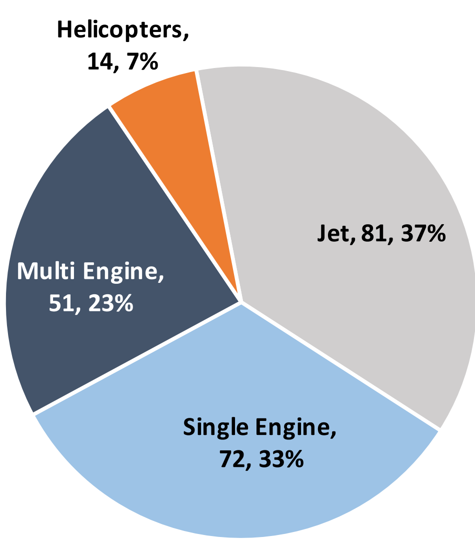
Rank	Top-10 Commodities	Value in 2016$ (Millions)	Tons (Thousands)
1	Electronics	915.54	4.29
2	Transport equip.	628.26	1.09
3	Precision instruments	358.73	1.23
4	Pharmaceuticals	137.72	0.68
5	Motorized vehicles	126.43	1.89
6	Machinery	114.17	1.39
7	Misc. mfg. prods.	104.20	0.59
8	Articles-base metal	42.67	0.99
9	Textiles/leather	39.07	1.00
10	Basic chemicals	23.04	0.37
	Other	110.58	4.99
	All Commodities	2,600.42	18.53



Sources: U.S. Department of Transportation Bureau of Transportation Statistics and Federal Highway Administration Freight Analysis Framework Version 4.

Pharmaceutical products, traditionally requiring expedited and cold-chain transport, ranked fourth in inbound commodities, accounting for 5 percent of the value of air cargo goods shipped to San Antonio in 2016. Although motorized vehicles did not rank as high in value for inbound shipments, they ranked the second-highest in terms of total tonnage (1,890 tons). Machinery were the most valuable commodities imported to San Antonio as international air cargo. They accounted for 31 percent of all import commodity values, followed by textiles/leather, base metals and electronics, which each accounted for just over 10 percent. Nearly half of the import commodity values were imports from Europe; 31 percent were imports from Eastern Asia; and 14 percent were imports from Central and South America, excluding Mexico; and less than 5 percent were imports from other regions in the world, including Mexico.

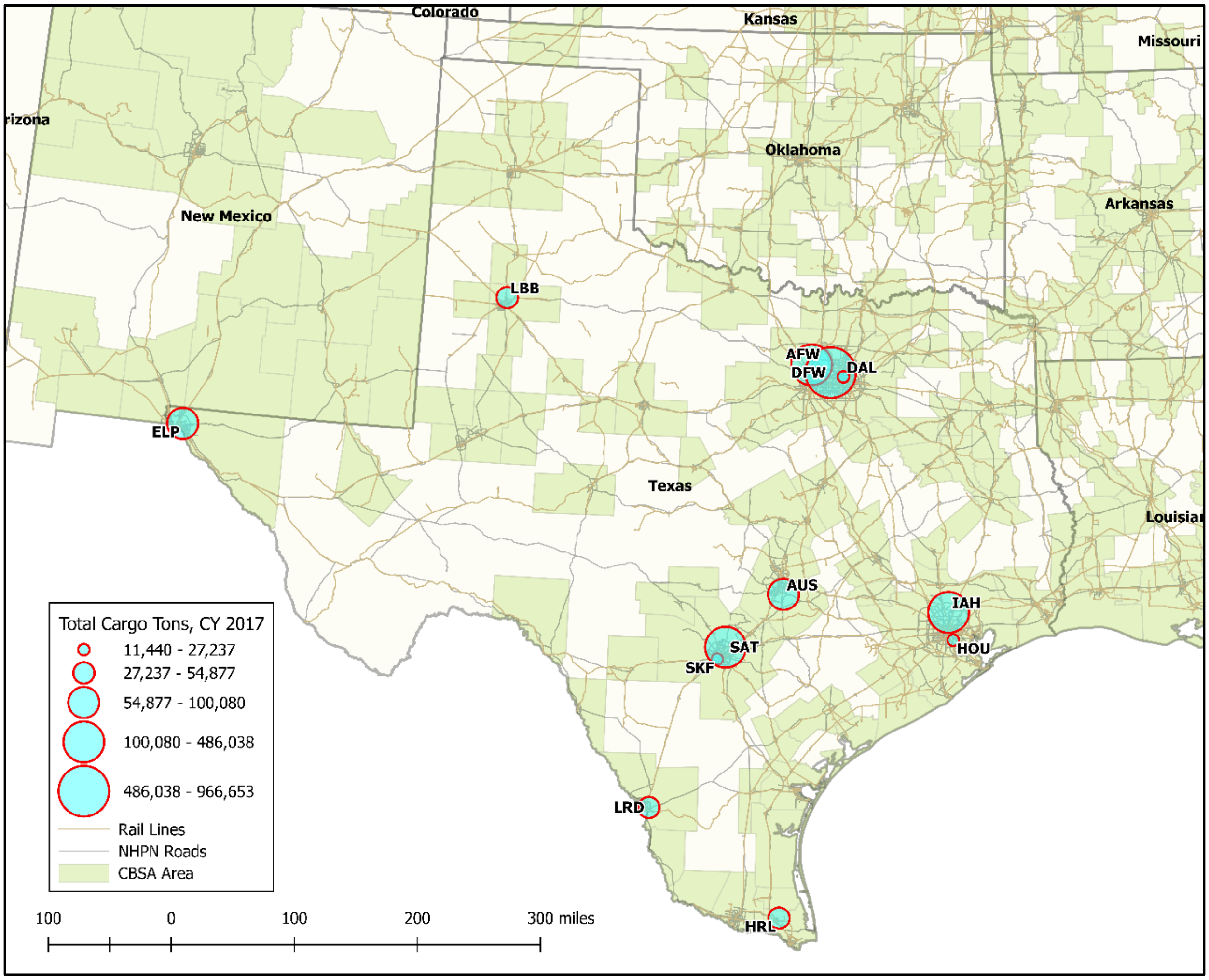
Overall inbound shipments made up a larger share of total air cargo activity in San Antonio. They accounted for 67 percent of the region's total value of air cargo goods, while outbound shipment accounted for the remaining 33 percent. They also made up around 55 percent of the region's total tonnage of air cargo goods, while outbound shipments made up the remaining 45 percent.



3.3.3 REGIONAL COMPETITION

SAT's air cargo service area overlaps with large cargo hubs in the state, which account for a substantial share of the regional air cargo market. **Figure 3.3-3** shows the cargo tonnage that departed and landed at the top-12 commercial airports in Texas. These airports accounted for nearly all of the state's air cargo traffic, with the top 4 (including SAT) each accounting for over 5 percent. Given that freight commodities are relatively insensitive to circuity and multimodal transport, airports can serve cargo demand from distances much farther than they can attract passengers from. Therefore, SAT's air cargo service area is potentially shared by at least eight other airports within a 250-mile radius, three of which rank among the top 40 air cargo airports in the nation. These airports, which include regional hubs of integrated carriers and international gateways, serve as key consolidation points for shipments moving in the southwestern region.

Figure 3.3-3: Enplaned and Deplaned Cargo Tonnage for Top 12 Airports in Texas (metric tons)

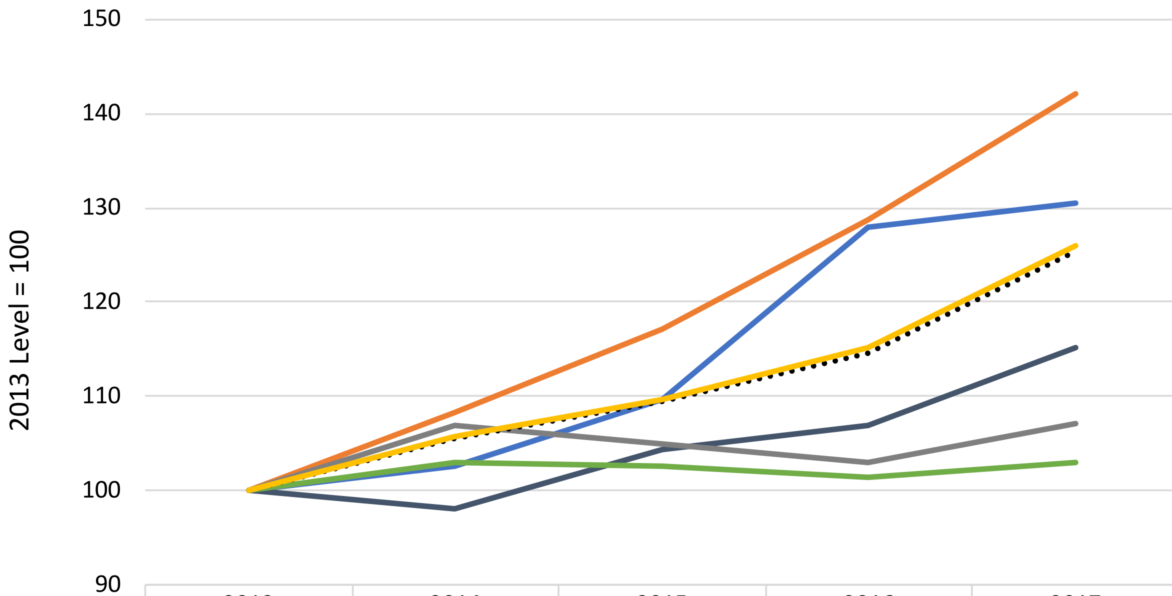


Airport	Airport Code	2013	2014	2015	2016	2017	2017 Share of Texas Total	2017 Rank in Texas
Dallas-Fort Worth	DFW	680,220	736,009	796,460	875,008	966,653	45.4%	1
George Bush Intercontinental	IAH	453,526	484,986	475,907	466,701	486,038	22.8%	2
Fort Worth Alliance	AFW	115,186	118,244	126,321	147,370	150,265	7.1%	3
San Antonio	SAT	124,589	128,391	127,827	126,374	128,415	6.0%	4
Austin-Bergstrom	AUS	86,836	85,189	90,609	92,820	100,080	4.7%	5
El Paso	ELP	80,622	81,256	85,500	80,638	87,408	4.1%	6
Lubbock Preston Smith	LBB	51,720	53,196	53,136	49,959	54,877	2.6%	7
Valley	HRL	32,633	30,742	33,366	43,932	47,680	2.2%	8
Laredo	LRD	30,844	31,201	25,979	28,622	37,952	1.8%	9
Kelly Field/Lackland AFB	SKF	0	51	143	54	27,237	1.3%	10
Dallas Love Field	DAL	12,231	11,708	15,472	11,356	14,667	0.7%	11
Houston Hobby	HOU	14,883	14,502	13,143	8,931	11,440	0.5%	12
	Top 12	1,683,290	1,775,476	1,843,863	1,931,765	2,112,711	99.1%	
	Texas Total	**1,699,272**	**1,793,221**	**1,860,403**	**1,947,026**	**2,131,153**		

Sources: Unison Consulting, Inc. using data from U.S. Department of Transportation National Transportation Atlas Database (NTAD) and U.S. Department of Transportation Bureau of Transportation Statistics T-100 Segment.

Texas's air cargo traffic has kept pace with national air cargo trends, growing at approximately the same rate since 2013 (**Figure 3.3-4**). Total air cargo traffic in the state grew by 25 percent between 2013 and 2017, while total air cargo traffic in the U.S. grew by approximately 26 percent.

Figure 3.3-4: Growth of Air Cargo Total Tonnage (2013 Levels = 100)



	2013	2014	2015	2016	2017
AFW	100	103	110	128	130
AUS	100	98	104	107	115
DFW	100	108	117	129	142
IAH	100	107	105	103	107
SAT	100	103	103	101	103
TX Total	100	106	109	115	125
US Total	100	106	110	115	126

Sources: Unison Consulting, Inc. using data from U.S. Department of Transportation Bureau of Transportation Statistics T-100 Segment.

Most of the air cargo growth in Texas is driven by DFW, which accounted for nearly half of the state's air cargo tonnage in 2017. DFW serves as the southwest regional hub for UPS and is also home to Ameriflight, the largest FAA Part 135 cargo carrier in the country. As the largest hub for American Airlines and an international gateway, DFW is the fourth-busiest airport in the nation, in terms of aircraft operations. It has substantial cargo services from cargo divisions of major passenger airlines and from dedicated cargo services of international carriers. The city of Fort Worth is also served by AFW, a regional hub for FedEx. Besides general aviation aircraft operations, AFW is dedicated to cargo and related logistical services. Both airports in the Dallas–Fort Worth metroplex provide important linkages to the national hubs of UPS and FedEx, Memphis International (MEM) and Louisville International (SDF), respectively.

Air cargo traffic at SAT shows trends most similar to the second-largest cargo airport in the region, IAH. IAH handles more cargo compared with SAT given that the airport serves as a hub and international gateway to Houston, the largest city in Texas and the fourth largest in the country.[10] Although IAH also has a broader mix of dedicated cargo and passenger carrier aircraft operations, both SAT and IAH serve as

[10] IAH is the second-largest hub for United Airlines, second to Chicago O'Hare (ORD).

spoke cities to the hub services of UPS and FedEx. Unlike other airports in the region, air cargo traffic levels declined at SAT and IAH in 2015 and 2016, after increasing slightly in 2014. SAT's cargo traffic, however, has not increased at the same rate as IAH in 2017.

Figure 3.3-4 highlights the top five cargo airports in Texas, which accounted for at least 5 percent of total cargo tonnage in 2017. SAT lags behind all of these airports, showing a growth of 3 percent between 2013 and 2017. Together, all Texas airports grew their cargo traffic by 25 percent over the same period.

The slow growth in SAT's cargo traffic can be attributed to the Airport's proximity to key cargo airports in the region, which serve as hubs and international gateways to the largest cargo and passenger carriers in the world. A substantial portion of San Antonio's air cargo shipments can be trucked to regional hub facilities before being flown to sorting facilities or directly to their final destinations. The extensive network connectivity to international markets, flight frequency, and direct-flight services provided by both freighter and passenger carriers at gateway airports, is also attractive to shippers and freight forwarders. Therefore, the presence of these hub and gateway airports attenuates organic growth in air cargo traffic at other airports in the region, which rely on local or regional demand. San Antonio's air cargo traffic has exhibited strong growth in 2018. The Airport's statistics for July 2018 show that total air cargo tonnage increased 14.5 percent year-over-year, and just over 11 percent calendar year-to-date.

SAT retains competitive advantage over the region's key cargo airports by providing quick access to the metro area's fast-growing population and industry sectors (e.g., IT and Cyber Security). Air cargo growth at SAT depends on demand, particularly in e-commerce, from local consumers and businesses within the Airport's service area. Several carriers, including FedEx, UPS, DHL (operated by Kalitta Air), provide scheduled commercial air cargo services at SAT. Other air cargo carriers, such as Ameriflight and Martinaire Aviation, offer regular chartered flights at the Airport as well.

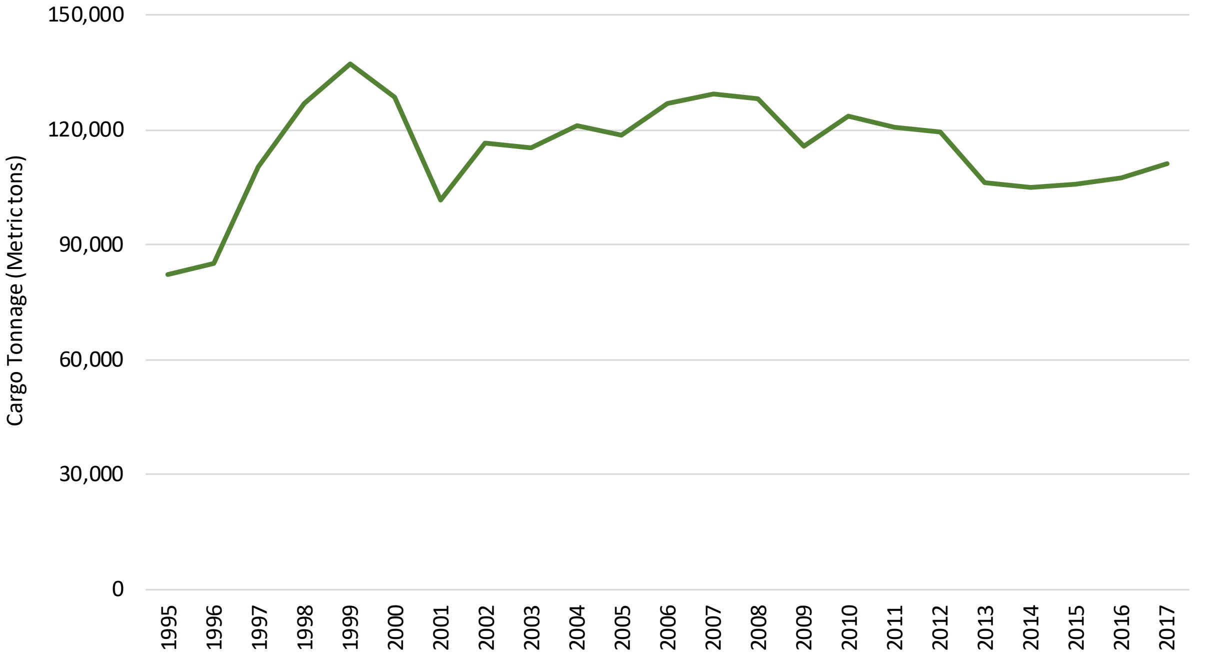
While SAT has historically served as the primary cargo airport for the San Antonio metropolitan area, SKF is a growing local competitor. Located approximately 17 miles south-west of SAT, SKF managed to attract Amazon Air's service in 2017, operated by ABX Air, Air Transport International, and Atlas Air. Amazon Air currently connects SKF with Cincinnati/Northern Kentucky International (CVG), its primary hub, and Ontario International (ONT). This new service has diverted e-commerce traffic from SAT, some of which was previously fulfilled by UPS.

3.3.4 SAT'S HISTORICAL AIR CARGO TRENDS

Historical trends in SAT's air cargo tonnage are provided in **Figures 3.3-5** through **3.3-7**.

Figure 3.3-5 shows that SAT's air cargo volume grew rapidly in the late 1990's, consistent with the national economic expansion of that period, and peaked in 1999 at around 137,200 tons. Cargo tons fell nearly 26 percent through 2001, following national trends that reflected the impacts of an economic recession and a slowdown in high-tech product shipments. Increased security in the U.S. air transport system, as a result of the 2001 terrorist attacks also impacted air cargo shipments, as shippers increasingly substituted other surface modes to transport their freight and small packages. SAT's air cargo traffic recovered partially through 2007, growing at annual average rate of 4 percent and reaching 129,200 tons. Following national trends, air cargo traffic declined through the Great Recession and has remained below 124,000 tons per year since 2008. In response to the Transportation Security Administration's (TSA) requirements to screen belly-hold cargo, passenger carriers have also reduced their cargo activity at SAT. Trends in recent years indicate that the level of enplaned and deplaned cargo tonnage is slowly recovering, from a low of 105,000 tons in 2014 to reach 111,200 tons in 2017 (4 percent annual growth in 2017).[11]

Figure 3.3-5: SAT Historical Trends in Air Cargo Tonnage (Fiscal Years 1995-2017)



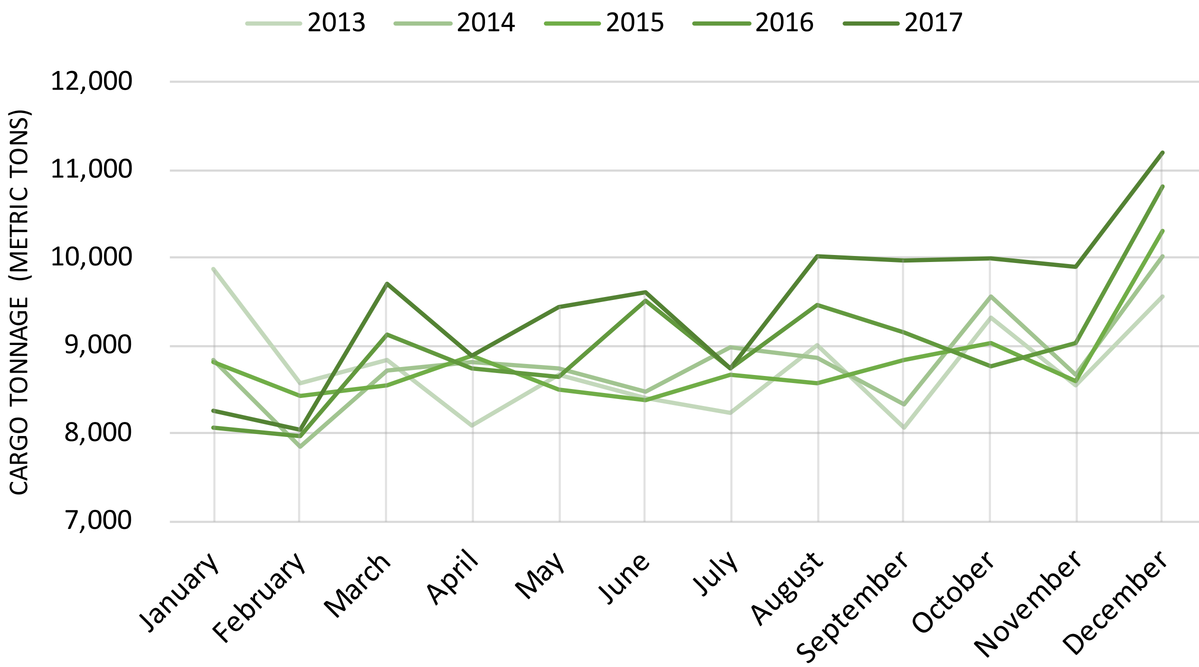
Sources: San Antonio Department of Aviation and Unison Consulting, Inc.

Figure 3.3-6 shows the monthly trends in total cargo tonnage at SAT over the past five years. The Airport's market exhibits a noticeable peak month for air cargo tonnage in December, accounting for almost 20 percent more traffic compared with other months of the year. For the Master Plan, peak months are useful for gauging the adequacy of airport capacity.

The shares of enplaned and deplaned cargo are provided in **Figure 3.3-7**. Similar to the composition revealed by the FAF data for the San Antonio region, the shares shown in Figure 3.3-7 confirm that SAT has a stronger inbound market compared with the outbound market. These shares of outbound and inbound cargo have remained constant since 2009. Typically, carriers will include additional stops in their network (e.g., between SAT and their respective hubs) to resolve imbalances in their markets.

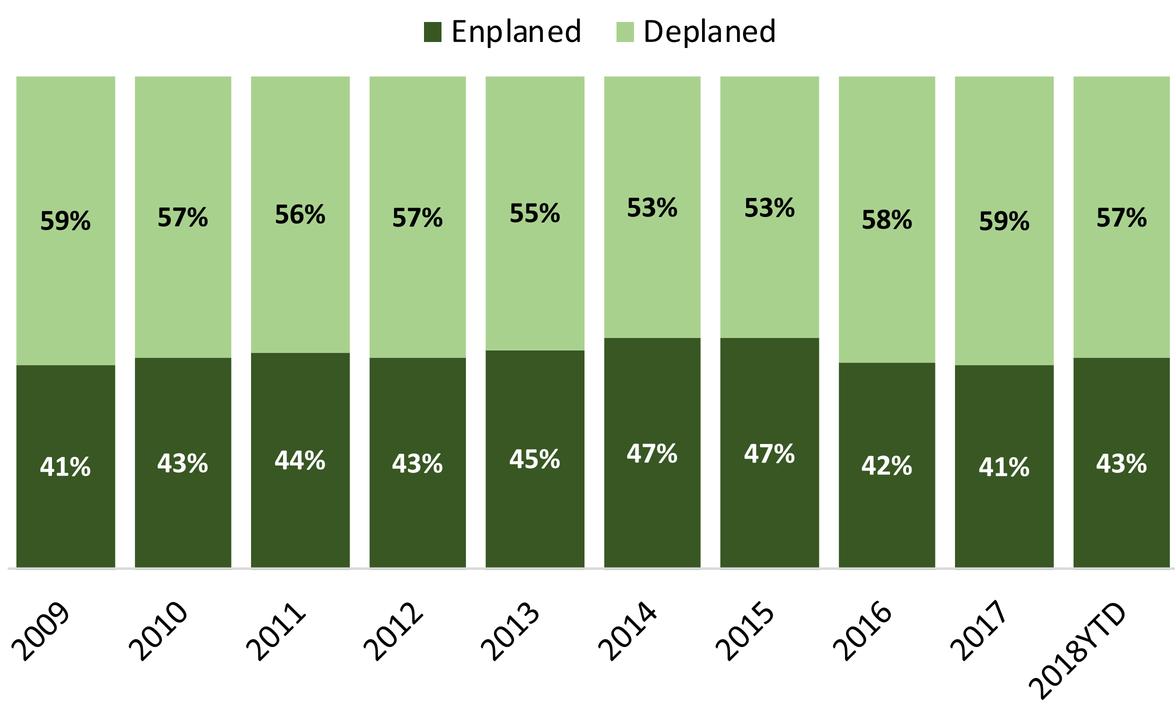
[11] Note that San Antonio Department of Aviation data on air cargo traffic represent total enplaned and deplaned cargo tonnage, not total departed and landed cargo tonnage as previously reported (based on data obtained from the U.S. DOT BTS T-100). Further the annual data shown in this section are shown in federal fiscal years.

Figure 3.3-6: Monthly Trends in Air Cargo Tonnage



Sources: San Antonio Department of Aviation and Unison Consulting, Inc.

Figure 3.3-7: Shares in Enplaned and Deplaned Air Cargo Tonnage (2009-2017)



Sources: San Antonio Department of Aviation and Unison Consulting, Inc.

Table 3.3-3 shows the amount of enplaned and deplaned cargo tonnage by carrier in 2017 and through April 2018. The majority of SAT's freight traffic is handled by the all-cargo integrators, FedEx and UPS, which accounted for 102,006 tons or 91.7 percent of SAT's cargo traffic in 2017. FedEx, operating a broad mix of large jets and small feeder aircraft, carried nearly 63,000 tons (56.4 percent) of SAT's cargo in 2017, while UPS moved around 39,300 tons (35.3 percent) of the Airport's cargo with a mix of wide-body jets. Kalitta Air currently operates a fleet of Boeing 767-300 aircraft for DHL Aviation, offering five weekly flights to SAT from Cincinnati (CVG). Although Kalitta/DHL did not carry scheduled cargo in 2017, Kalitta offered scheduled and nonscheduled chartered services in 2017 alongside Ameriflight, Martinaire Aviation, and other charter carriers. All-cargo charters accounted for 2.3 percent of SAT's air cargo tonnage in 2017.

Passenger aircraft hauled 6,660 tons of air cargo (6 percent of SAT's tonnage) in their belly holds in 2017. United Airlines and Southwest Airlines each accounted for 1.8 tons of SAT's air cargo (over 1.6 percent), while Delta Air Lines and American Airlines each carried around 1.4 tons (1.3 percent). With the exception of American Airlines, the passenger carriers flew air cargo as part of their mainline service. The Airport's data through April 2018 shows that most of the cargo tonnage shares by carrier have not changed substantially.

Table 3.3-3: Air Cargo Tonnage by Carrier

	FY 2017		FY 2018 (Through April)	
	Metric Tons	**Share of Total**	**Metric Tons**	**Share of Total**
All-Cargo Carriers				
FedEx Express	62,728	56.4%	35,435	50.9%
UPS Airlines	39,278	35.3%	27,404	39.4%
Kalitta Air/DHL Aviation	0	0.0%	615	0.9%
Subtotal	**102,006**	**91.7%**	**63,455**	**91.2%**
All-Cargo Charter				
Ameriflight	1,712	1.5%	984	1.4%
Martinaire Aviation	109	0.1%	71	0.1%
Kalitta Air	14	0.0%	10	0.0%
Other/Nonscheduled	731	0.7%	878	1.3%
Subtotal	**2,566**	**2.3%**	**1,943**	**2.8%**
Passenger Airline Belly Cargo				
United Airlines	1,875	1.7%	1,305	1.9%
Southwest Airlines	1,809	1.6%	1,128	1.6%
Delta Air Lines	1,443	1.3%	732	1.1%
American Airlines	1,400	1.3%	937	1.3%
Alaska Airlines	132	0.1%	86	0.1%
Subtotal	**6,660**	**6.0%**	**4,189**	**6.0%**
Total	**111,232**	**100.0%**	**69,590**	**100.0%**

Note: FY – Fiscal Year

Sources: San Antonio Department of Aviation and Unison Consulting, Inc.

3.3.5 FORECAST AIR CARGO ACTIVITY

SAT's air cargo tonnage is forecast using regional freight growth rates from the FAF, a freight modeling database and tool developed through a partnership between BTS and FHWA. FAF provides detailed estimates of existing freight movement, including foreign trade and domestic goods, across and within freight regions and states in the United States. The current version of FAF (FAF4), which is calibrated with the 2012 Commodity Flow Survey (CFS) data and international trade data from the Census Bureau, combines a wide range of data sources to construct its database and freight flow estimates. Beyond the base year of 2012, FAF provides estimates of freight movement for 2013 through 2016, and forecasts from 2020 through 2045 in 5-year intervals. The database also provides region-, commodity- and mode-specific freight-growth projections.

SAT's air cargo activity is forecast at a regional level, while accounting for national goods-movement dynamics that impact local and regional cargo demand. Annual average growth rates from FAF for the San Antonio FAF Zone (also the San Antonio-New Braunfels MSA) for the forecast period 2018 through 2040 are applied to the estimated air cargo tonnage at SAT in FY 2018. Freight flows by air and alternate ground modes for transporting air freight (truck, rail and multiple modes) were first selected from the FAF database. This approach assumes that (1) the air mode will retain its share among the selected freight transport modes and (2) SAT will maintain its share of the FAF zone's local air cargo activity over the Master Plan forecast period.[12]

Total air cargo is projected to grow from an estimated 121,100 metric tons in 2018 to 161,600 metric tons in 2038 under the Master Plan forecast growth scenario. Under the high growth scenario, air cargo is forecast to grow to 171,100 metric tons by 2038. All-cargo carriers are projected to continue to account for the predominant share (96 percent) of air cargo tons, while passenger carriers account for the remaining share (4 percent) using their belly-hold cargo capacity. All-cargo carrier aircraft operations and landed weight are projected to grow at a slower pace than total cargo under the Master Plan and high growth scenarios because much of the growth in total cargo is expected to be accommodated with increased load factors on each flight.

All-cargo aircraft operations grew substantially in 2017, as integrators (UPS Airlines, in particular) increased their service at SAT. With the addition of five weekly flights from DHL/Kalitta Air in 2018, all-cargo landings are forecast to continue their fast growth through 2020. However, all-cargo aircraft operations are projected to grow at a slower rate beyond 2020, given that most of the forecast organic growth in air cargo tons can be accommodated on existing flights. Landed weight can exhibit different trends from landings in some years, primarily due to changes in the fleet composition operated at the Airport. Reflecting the introduction of Kalitta/DHL's scheduled air cargo services, landed weight for all-cargo services is estimated to rise by 11 percent in 2018. The growth rate in landed weight decreases shortly after 2018 as FedEx Express is expected to replace its aging MD-10 and MD-11 series aircraft with Boeing 757-200 and Boeing 767-300 planes aircraft by 2022. FedEx is also expected to stop operating its Airbus fleet at SAT, within five years.

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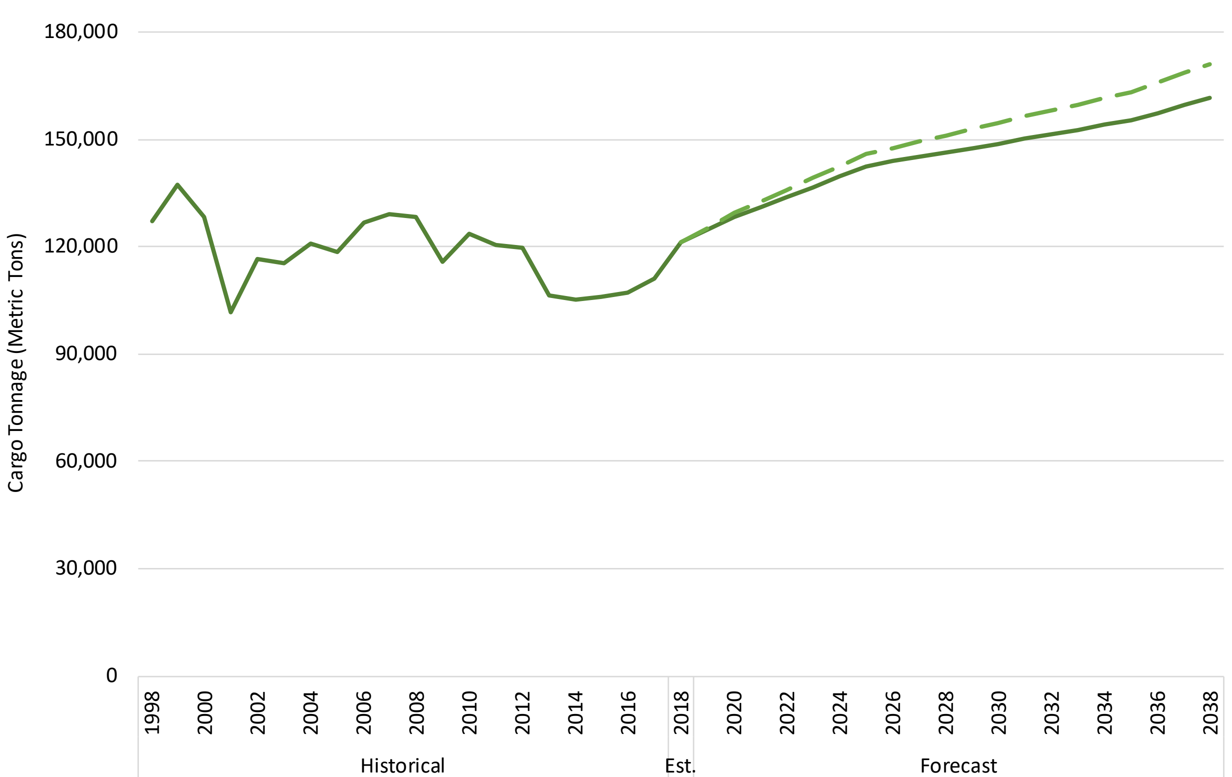
[12] Note that FAF traffic flows are commodity based: regional truck flows that are not transporting FAF commodities are excluded (e.g., trucks transporting construction equipment and delivery-service trucks are not included). Commodities transported by Air may be recorded under the multiple modes & mail for shipments weighing 100 pounds or less (e.g., express freight/mail), even though the Air mode includes truck-air freight (for shipments generally weighing more than 100 pounds).

Figure 3.3-8 shows the Master Plan and high growth scenario forecasts of air cargo tonnage for SAT. **Tables 3.3-4** through **3.3-6** summarize the forecast cargo tonnage, all-cargo aircraft operations, and all-cargo aircraft landed weight.

Figure 3.3-8: Air Cargo Tonnage – Historical and Forecast (Metric Tons) (Fiscal Years 1998-2038)



Sources: San Antonio Department of Aviation, US Department of Transportation FAF4, Unison Consulting, Inc.

Table 3.3-4: Forecast Cargo Tonnage (Metric Tons)

	Actual	Est.	Forecast			Compound Annual Growth Rate			
Scenario	**2017**	**2018**	**2023**	**2028**	**2038**	**2018-2023**	**2023-2028**	**2028-2038**	**2018-2038**
Master Plan (MP)	111,232	121,098	136,684	146,257	161,616	2.5%	1.4%	1.0%	1.5%
All-Cargo Carrier	107,139	116,784	131,404	140,382	154,788	2.4%	1.3%	1.0%	1.4%
Passenger Carrier (Belly)	4,094	4,314	5,281	5,875	6,828	4.1%	2.2%	1.5%	2.3%
High Growth (HG)	111,232	121,098	139,101	151,082	171,095	2.8%	1.7%	1.3%	1.7%
All-Cargo Carrier	107,139	116,784	133,670	144,908	163,679	2.7%	1.6%	1.2%	1.7%
Passenger Carrier (Belly)	4,094	4,314	5,431	6,174	7,416	4.7%	2.6%	1.8%	2.7%

Note: Est. – Estimated

Sources: San Antonio Department of Aviation, US DOT FAF4, Unison Consulting, Inc.

Table 3.3-5: Forecast All-Cargo Aircraft Operations

	Actual	Est.	Forecast			Compound Annual Growth Rate			
Scenario	**2017**	**2018**	**2023**	**2028**	**2038**	**2018-2023**	**2023-2028**	**2028-2038**	**2018-2038**
Master Plan (MP)	8,414	9,395	10,326	10,591	10,925	1.9%	0.5%	0.3%	0.8%
High Growth (HG)	8,414	9,395	10,376	10,749	11,276	2.0%	0.7%	0.5%	0.9%

Note: Est. – Estimated

Sources: San Antonio Department of Aviation, US DOT FAF4, Unison Consulting, Inc.

Table 3.3-6: Forecast All-Cargo Aircraft Landed Weight (1,000 Pounds)

	Actual	Est.	Forecast			Compound Annual Growth Rate			
Scenario	**2017**	**2018**	**2023**	**2028**	**2038**	**2018-2023**	**2023-2028**	**2028-2038**	**2018-2038**
Master Plan (MP)	833	928	973	1,011	1,058	1.0%	0.8%	0.5%	0.7%
High Growth (HG)	833	928	990	1,044	1,119	1.3%	1.1%	0.7%	0.9%

Note: Est. – Estimated

Sources: San Antonio Department of Aviation, US Department of Transportation Freight Analysis Framework FAF4, Unison Consulting, Inc.

The current fleet mix for all-cargo carriers is shown in **Table 3.3-7**.

Table 3.3-7: All-Cargo Fleet Mix Forecast

	All-Cargo Aircraft Operations			Share of All-Cargo Aircraft Operations		
All-Cargo Carrier/Aircraft	**FY 2017**	**FY 2018 (Through April)**	**FY 2038**	**FY 2017**	**FY 2018 (Through April)**	**FY 2038**
FedEx Express	**2,722**	**1,466**	**3,768**	**32%**	**28%**	**34%**
Airbus A300-600 (*Phased out by 2022*)	14	20	0	0%	0%	0%
Airbus A310-200	64	0	0	1%	0%	0%
Boeing 757-200	860	554	2,138	10%	11%	20%
Cessna 208 Caravan	750	400	835	9%	8%	8%
MD 10-10 (*Phased out by 2022*)	250	20	0	3%	0%	0%
MD 10-30 (*Phased out by 2022*)	236	318	0	3%	6%	0%
MD-11 (*Phased out by 2022*)	548	154	0	7%	3%	0%
Boeing 767-300 (*New*)	0	0	794	0%	0%	7%
UPS Airlines	**2,244**	**1,578**	**3,197**	**26%**	**29%**	**29%**
Airbus A300-600	2,032	1,386	2,845	24%	26%	26%
Boeing 757-200	158	96	198	2%	2%	2%
Boeing 767-300	26	38	79	0%	1%	1%
MD-11 (*Phased out by 2022*)	28	58	0	0%	1%	0%
Boeing 747-800 (*New*)	0	0	76	0%	0%	1%
Kalitta Air/DHL Aviation	**0**	**126**	**253**	**0%**	**2%**	**2%**
Boeing 767-300/300ER	0	126	253	0%	2%	2%
Subtotal	**4,966**	**3,170**	**7,217**	**59%**	**59%**	**65%**
All-Cargo Charter	**3,448**	**2,088**	**3,708**	**41%**	**41%**	**35%**
Total	**8,414**	**5,258**	**10,925**	**100%**	**100%**	**100%**

Notes:
FY – Fiscal Year
YTD – Year-to-Date

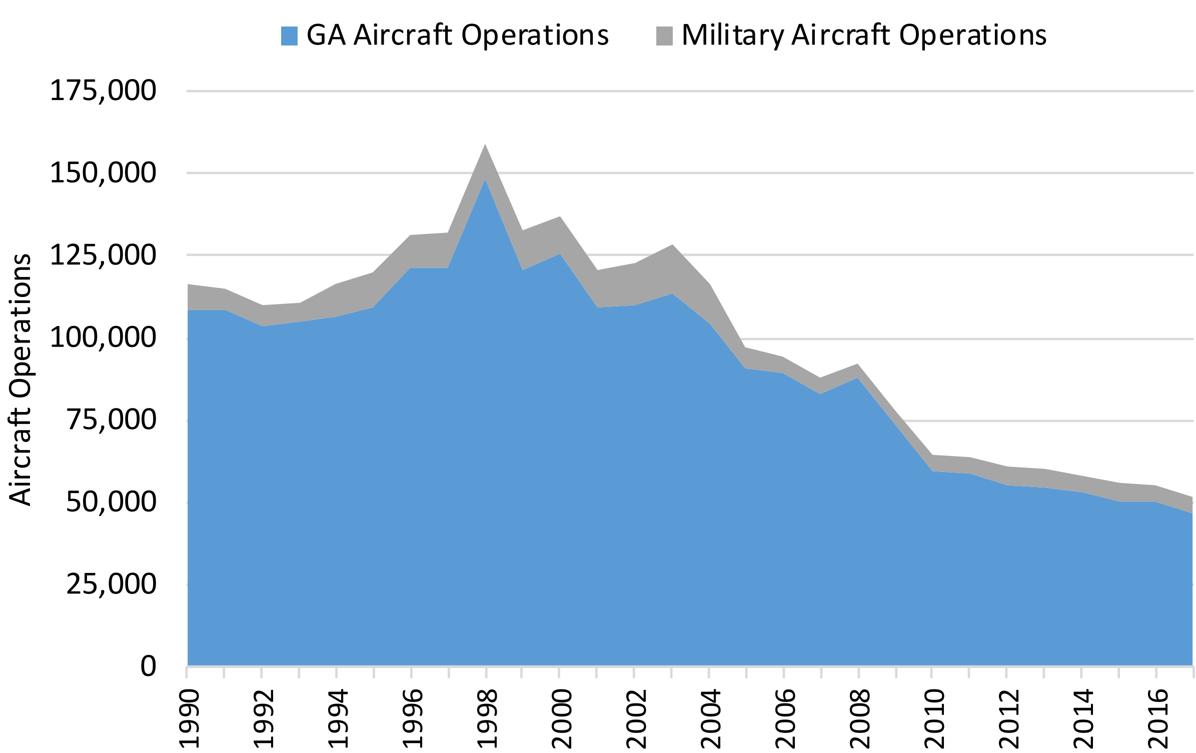
Sources: San Antonio Department of Aviation, Airlines, US Department of Transportation Bureau of Transportatin Statistics T-100 Segment, US US Department of Transportation Freight Analysis Framework FAF4, Unison Consulting, Inc.

Cargo airlines operate aircraft over a relatively long lifespan, typically longer than what is considered the useful life for passenger service equipment (approximately 30 years from the manufactured date). The forecast assumes FedEx will phase out its MD-10 and MD-11 series aircraft for replacement with Boeing 757-200 and 767-300 aircraft by 2022. FedEx's Airbus fleet will also be transitioned out for replacement by the Boeing aircraft. Pending modifications to ramp length, UPS is expected to transition its MD-11 series operations to Boeing 747-800F freighters beginning 2023. No other changes in the cargo fleet mix serving SAT are assumed.[13]

3.4 NONCOMMERCIAL AVIATION ACTIVITY

Noncommercial aviation activity includes aircraft operations of general aviation (GA) and military aircraft. **Figure 3.4-1** shows the historical trend in noncommercial aviation activity at SAT. Since the early 1990's, GA aircraft operations have accounted for around 92 percent of the Airport's noncommercial aviation activity, while military aircraft operations accounted for the remaining 8 percent. GA aircraft operations grew at an annual average rate of 1.5 percent between 1990 and 2000, but began a long-term decline starting in 2001 and through the Great Recession. They fell by 34 percent between 2000 and 2001, at an annual average rate of 6 percent, and dropped 32 percent between 2008 and 2010, following the Great Recession. GA flights have been on a downward trend since then, averaging an annual decline of 3 percent between 2010 and 2017. The most recent FAA tower data shows that GA aircraft operations have recovered year-to-date (through May 2018), growing by nearly 3 percent over the same period in 2017.

Figure 3.4-1: Trends in Noncommercial Aviation Activity (Fiscal Years 1998 – 2017)



Note: GA – General Aviation

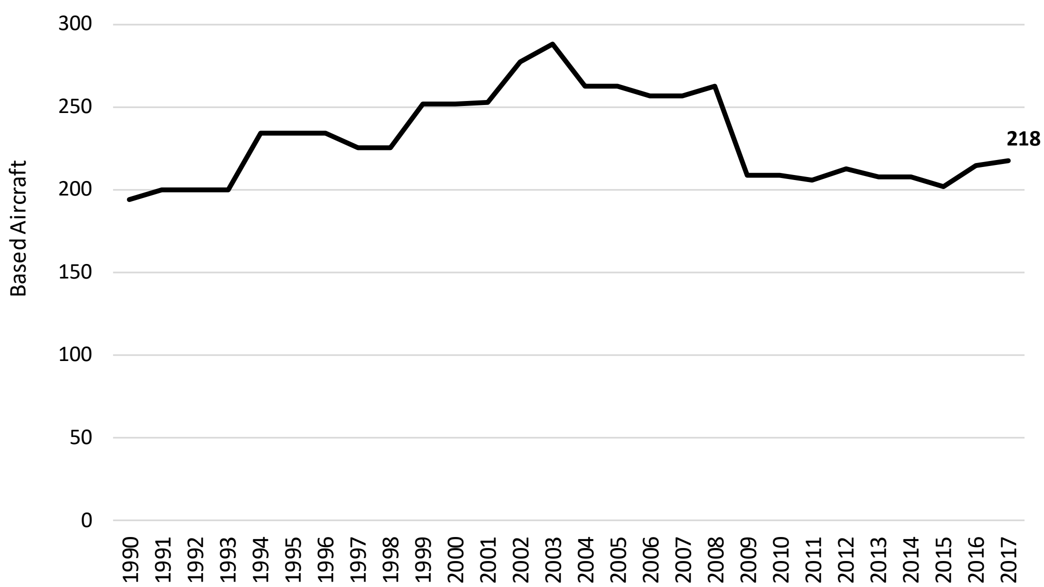
Sources: Federal Aviation Administration Operations Network/Air Traffic Activity System, FAA TAF (for FY 2008 correction), Airport Statistics, and Unison Consulting, Inc.

13 Peak month activity forecasts for air cargo operations were not developed due to the lack of data.

Military activity at SAT also increased in the 1990's and early 2000's, reaching peak annual aircraft operations in 2003. They also decreased rapidly in 2009, amid the Great Recession, following GA trends at the Airport. After recovering in 2010, and growing through 2013, military aircraft operations have returned to a slower downward trend similar to GA aircraft operations. They have declined at an annual average rate of 2 percent through 2017. Military aircraft operations accounted for 9 percent of noncommercial aviation activity in 2017, while GA aircraft operations made up the remaining 91 percent.

Figure 3.4-2 shows the number of based aircraft at SAT. Based aircraft showed an increasing trend between 1990 and 2003, reaching a peak at 288. They decreased by 25 aircraft through 2008 and another 54 aircraft in 2009, leveling off at around 210 aircraft. Unlike noncommercial aircraft operations, which have been on a declining trend since 2009, the number of based aircraft remained relatively stable over the past five years. The FAA's most recent data for 2017 shows an increase to 218 based aircraft at SAT.

Figure 3.4-2: Trends in Based Aircraft (Fiscal Years 1998-2017)



Sources: Federal Aviation Administration Terminal Area Forecast 2018, Airport Statistics and Unison Consulting, Inc.

Figure 3.4-3 shows the composition of SAT-based aircraft by aircraft type as of 2017. The based aircraft at SAT are GA aircraft consisting of 81 jet-engine aircraft, 72 single-engine piston/turboprop, 51 multi-engine piston/turboprop, and 14 helicopters. These based aircraft are flown to cover a variety of commercial and GA service needs at SAT.

Figure 3.4-3: Based Aircraft Composition (Fiscal Year 2017)

Sources: AirportIQ 5010 and Unison Consulting, Inc.

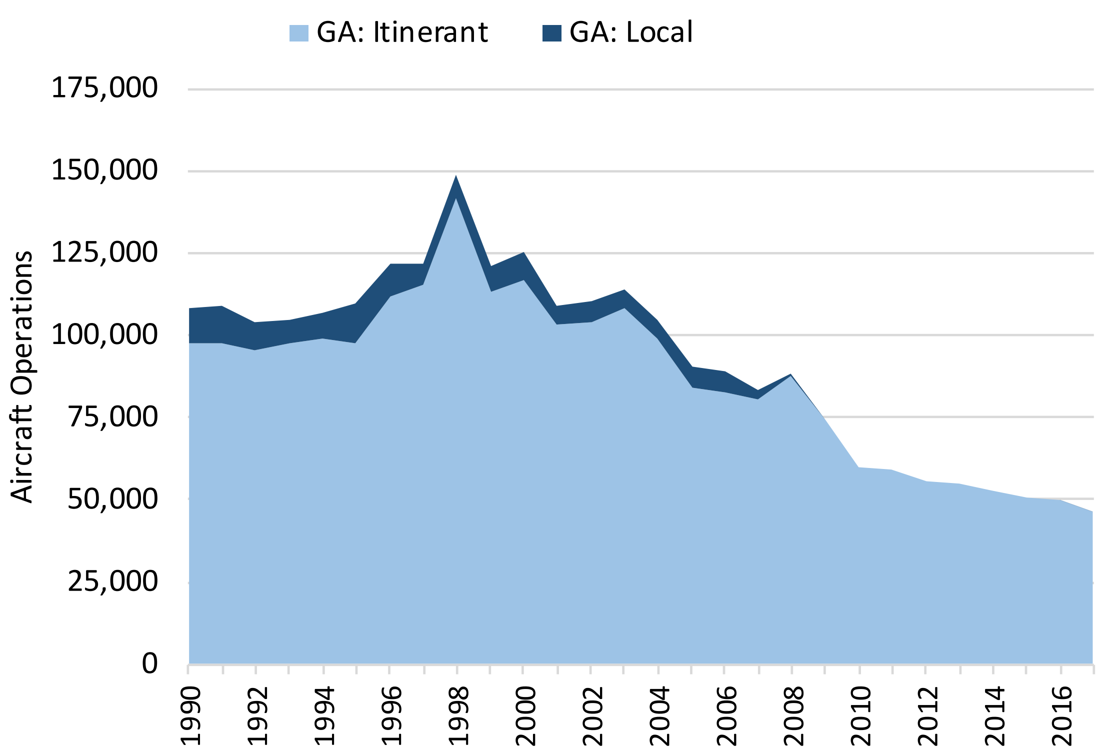
3.4.1 GENERAL AVIATION ACTIVITY – AIRPORT TRENDS

SAT's GA activity, comprised of itinerant and local operations, covers non-commercial and non-military passenger or cargo services provided at the Airport. GA activity typically satisfies local demands for air transport, including business travel, emergency transport, flight instruction, and recreational flying. It is therefore sensitive to both local and national economic conditions.

Itinerant operations are flights going to and coming from a different airport; they have historically accounted for a large majority of SAT's GA operations (over 90 percent), and nearly all of the SAT's GA activity over the past decade. Local GA operations include flights within the local traffic pattern of the airport. They typically involve activity related to personal and instructional flying and include flights to designated practice areas within 20 miles of an airport. Business and corporate-related GA activities are usually grouped under itinerant operations. Other aerial GA activities, such as flight school, sightseeing, and air medical, account for a small share of GA operations, and would also fall under the local GA category.

Figure 3.4-4 shows the trends in GA activity at SAT from 1990. Total GA operations peaked at 148,685 in 1998, growing 37 percent over eight years. Itinerant GA traffic grew by 45 percent over this period, while local GA traffic declined by 34 percent. Both local and itinerant GA operations declined steadily in the ensuing ten years, and declined sharply beginning in 2008 and 2009, respectively. Combined, local and itinerant GA activity have continued their decline through 2017. They have decreased nearly 70 percent between 1998 (historical peak) and 2017.

Figure 3.4-4: Local and Itinerant General Aviation Operations, (Fiscal Years 1998-2017)



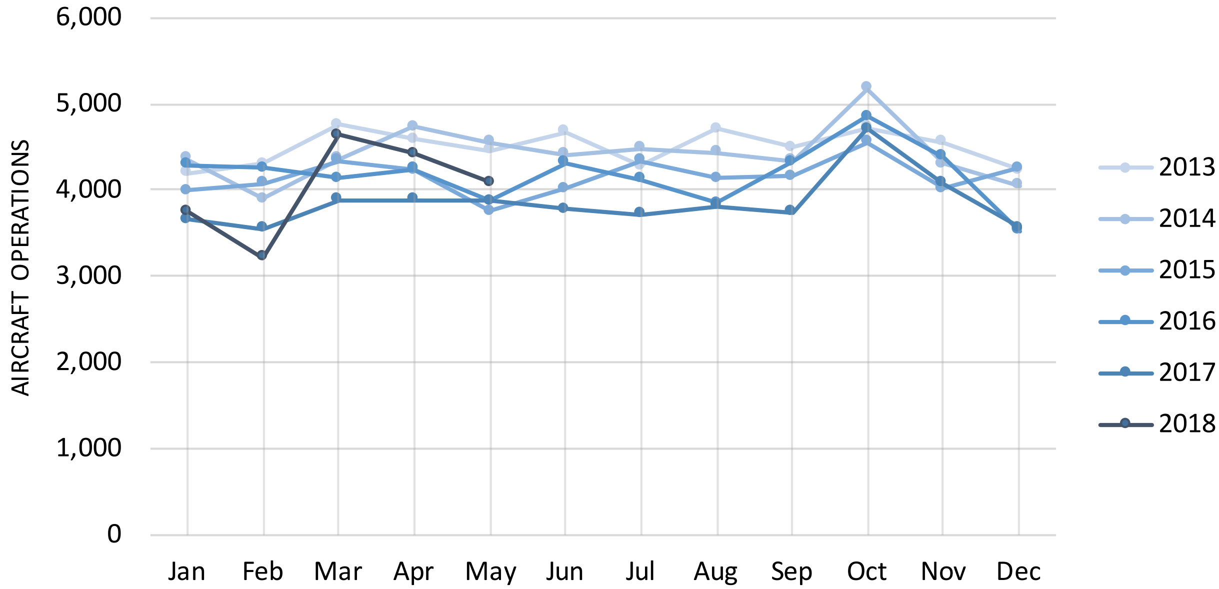
Note: GA – General Aviation

Sources: Federal Aviation Administration Operations Network/Air Traffic Activity System, Federal Aviation Administration Terminal Area Forecast (for Fiscal Year 2008 correction), Airport Statistics, and Unison Consulting, Inc.

Itinerant operations have accounted for 99 percent or more of total GA operations at SAT since 2008. These shares remain the same in 2018.

Figure 3.4-5 provides the monthly trends of all GA operations at SAT between January 2013 and May 2018. GA activity exhibits a seasonal pattern, with peaks occurring most frequently in the Fall (October) and early Spring (March).

Figure 3.4-5: Monthly General Aviation Aircraft Operations (January 2013- May 2018)

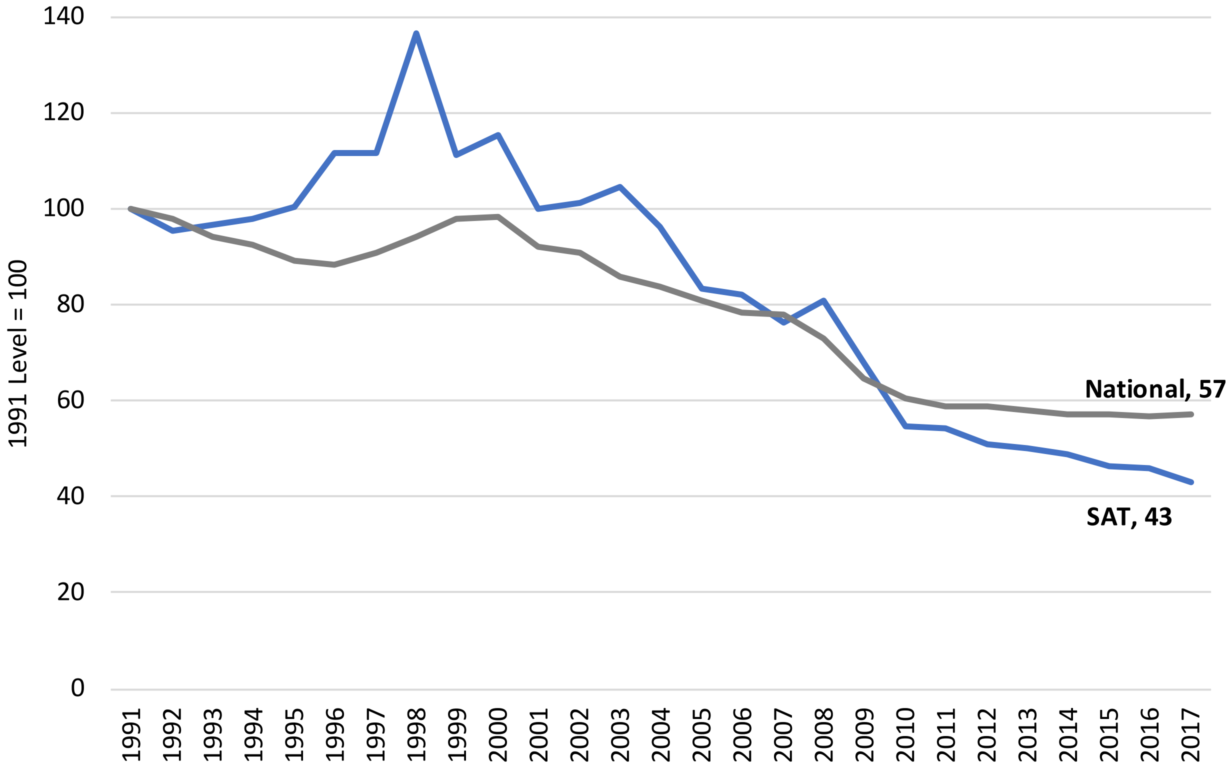


Sources: Federal Aviation Administration Operations Network/Air Traffic Activity System, Airport Statistics, and Unison Consulting, Inc.

3.4.2 GENERAL AVIATION ACTIVITY – NATIONAL TRENDS

GA activity at SAT follows the national trend of declining operations, which began four decades ago. **Figure 3.4-6** shows the trends in GA operations at SAT alongside national trends since 1991. Compared with the national trend, SAT's GA operations have increased and decreased more sharply. SAT's GA operations have decreased 57 percent compared with 1991 levels, while national GA activity declined 43 percent over the same period. The U.S. economic recessions, particularly the Great Recession in 2008-2009 and the subsequent slow economic recovery, depressed GA activity nationwide. Other factors also contributed to the decrease in GA activity. The pilot population has shrunk since reaching its peak in the 1980s. GA aircraft production has also decreased and has not kept up with the pace of aircraft retirement from the existing fleet. Finally, aviation fuel prices rose to record high levels until their decline in 2014.

Figure 3.4-6: General Aviation Aircraft Operations at SAT and in U.S. (Fiscal Year 1991 Levels = 100)



Note: SAT – San Antonio International Airport

Sources: Federal Aviation Administration Operations Network/Air Traffic Activity System, Federal Aviation Administration Terminal Area Forecast, and Unison Consulting, Inc.

3.4.3 FORECAST OF NONCOMMERCIAL AVIATION ACTIVITY NATIONWIDE

Since SAT's GA activity is affected by national drivers, GA operations at SAT are projected to follow national trends. The system-wide forecast prepared by the FAA in the FAA's Aerospace Forecast for 2018 to 2038 provides a reasonable guide for projecting GA activity and based aircraft at SAT.

FEDERAL AVIATION ADMINIATRATION AEROSPACE FORECASTS

Each year, the FAA publishes high-level forecasts for national aviation activity, including forecasts on GA operations. Based on economic drivers of GA activity, the FAA also provides forecasts of aircraft fleet mix, hours of operation by category of aircraft, and the number of active pilots. The highlights of the FAA's long-term outlook for GA activity are as follows:

- Stable growth in GA operations, averaging 0.3 percent annually between 2018 and 2038, with local operations growing slightly faster than itinerant operations.
- Growth in the active GA fleet at an average annual rate of 0.08 percent.

- Decrease in fixed-wing piston aircraft, the largest category of the current fleet, at an average annual rate of 1.1 percent, and increase in turbine powered aircraft at an average annual rate of 1.8 percent annually, driving growth of the GA aircraft population.
- Increase in GA hours flown by 0.8 percent annually.
- Increase in the number of active air transport pilots by 0.7 percent annually and decrease in the number of active GA pilots by 0.4 percent annually.
- Decreases in active private and commercial pilot populations at average annual rates of 0.9 percent and 0.4 percent, respectively.
- Increases in sport pilots at an average annual rate of 3.3 percent.

Table 3.4-1 presents the FAA's forecast annual average growth rates for U.S. GA operations, active GA fleet, and hours flown.

Table 3.4-1: Forecast for U.S. General Aviation Activity

GA Aircraft Operations			**2017-18**	**2018-28**	**2018-38**
GA		Itinerant	0.2%	0.2%	0.3%
		Local	1.8%	0.3%	0.3%
	Total GA Aircraft Operations		**0.9%**	**0.3%**	**0.3%**
Active GA Fleet			**2017-18**	**2018-28**	**2018-38**
Fixed Wing	Piston	Single Engine	0.1%	-0.9%	-1.0%
		Multi-Engine	-0.3%	-0.3%	-0.4%
	Turbine	Turbo Prop	-2.5%	0.7%	1.7%
		Turbo Jet	2.2%	2.3%	2.2%
Rotorcraft		Piston	1.8%	1.5%	1.5%
		Turbine	2.2%	2.0%	1.9%
Other*			0.5%	0.0%	0.0%
	Total GA Fleet		**0.4%**	**-0.1%**	**0.0%**
Hours Flown			**2017-18**	**2018-28**	**2018-38**
Fixed Wing	Piston	Single Engine	-0.9%	-1.6%	-1.1%
		Multi-Engine	-1.1%	-0.6%	-0.3%
	Turbine	Turbo Prop	-1.2%	0.8%	1.8%
		Turbo Jet	7.7%	3.2%	2.7%
Rotorcraft		Piston	3.0%	1.9%	1.7%
		Turbine	3.4%	2.6%	2.3%
Other*			0.5%	0.0%	0.1%
	Total GA Hours		**1.2%**	**0.5%**	**0.8%**

Notes:

GA – General Aviation

*Other aircraft include experimental, sport aircraft, airships, balloons, and gliders.

Sources: Federal Aviation Administration Aerospace Forecast 2018-2038 and Unison Consulting, Inc.

3.4.4 FORECAST NONCOMMERCIAL AVIATION ACTIVITY AT SAT

Table 3.4-2 presents the forecast of GA operations, military operations, and based aircraft. GA forecasts are derived from system-wide projections provided in the annual FAA Aerospace Forecast for FY 2018 through FY 2038. Local and itinerant GA operations at SAT are assumed to grow at the same rate forecasted by the FAA for local and itinerant GA aircraft operations, respectively, at all U.S. airports with FAA and contract air traffic controller service. Military operations are held constant at their level in 2017, while the growth in the number of based aircraft is projected to reflect the average annual growth rate of the past five years (1.2 percent).

Table 3.4-2: Forecast Noncommercial Aviation Activity

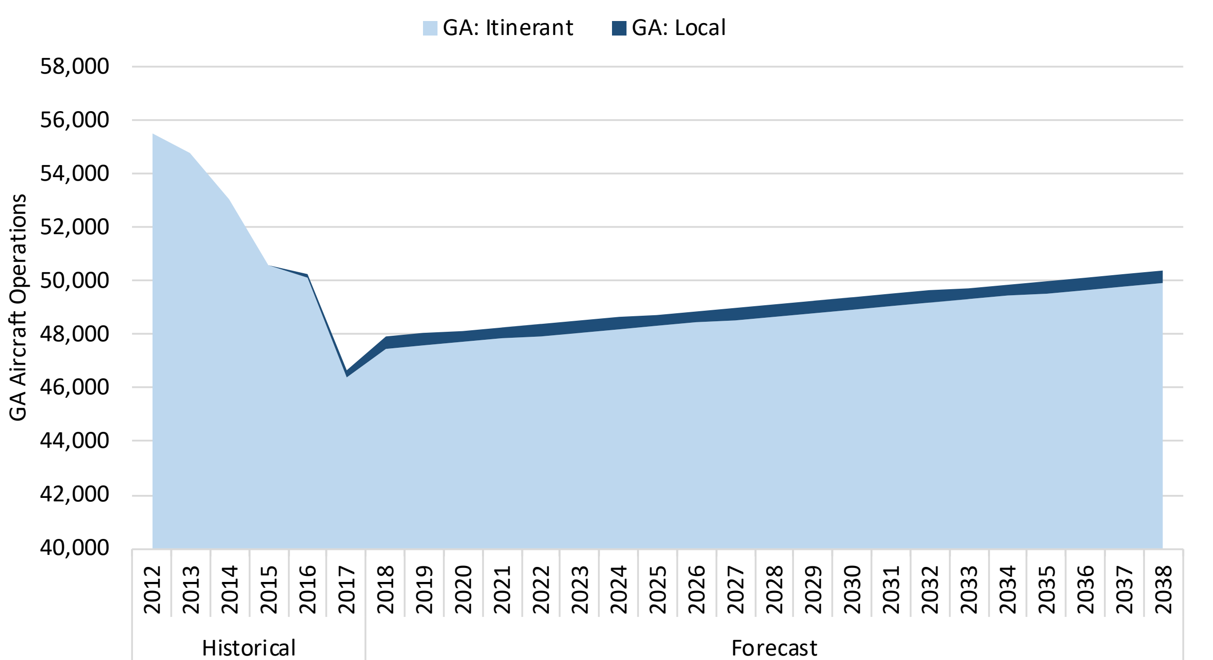
	Actual	Est.	Forecast			Compound Annual Growth Rate			
Measure/Scenario	**2017**	**2018**	**2023**	**2028**	**2038**	**2018-2023**	**2023-2028**	**2028-2038**	**2018-2038**
General Aviation	46,662	47,913	48,509	49,123	50,407	0.2%	0.3%	0.3%	0.3%
Itinerant	46,415	47,479	48,068	48,674	49,942	0.2%	0.3%	0.3%	0.3%
Local	247	434	441	449	464	0.3%	0.3%	0.3%	0.3%
Military	4,816	4,816	4,816	4,816	4,816	0.0%	0.0%	0.0%	0.0%
Based Aircraft	218	221	234	248	279	1.2%	1.2%	1.2%	1.2%

Note: Est. - estimated

Sources: Federal Aviation Administration Operations Network/Air Traffic Activity System, Airport Statistics, and Unison Consulting, Inc.

Figure 3.4-7 shows the forecast growth in GA operations, broken down between itinerant and local operations. Both itinerant and local operations are expected to grow slowly.

Figure 3.4-7: Forecast General Aviation Operations –Local vs. Itinerant Operations



Note: GA – General Aviation

Sources: Federal Aviation Administration Operations Network/Air Traffic Activity System, Airport Statistics, and Unison Consulting, Inc.

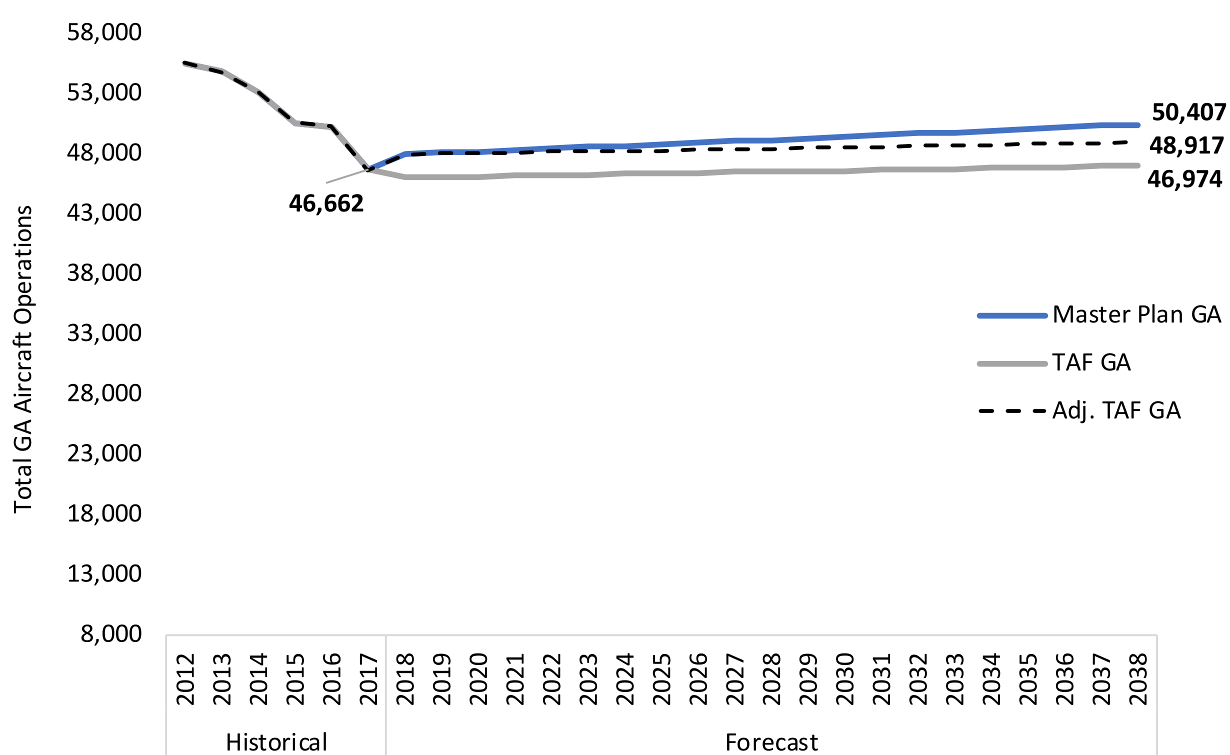
Consistent with recent trends, local operations are forecast to grow at a slightly faster rate than itinerant operations. Still, itinerant operations will continue to account for nearly all (99 percent) of the projected total GA operations at SAT.

COMPARISON WITH THE FAA TERMINAL AREA FORECAST FOR SAT

The FAA also provides airport-level aviation activity forecasts through its TAF program for active airports in the National Plan of Integrated Airport Systems (NPIAS). These forecasts are prepared to meet the budget and planning needs of the FAA and provide information for use by state and local authorities, the aviation industry, and the public. As such, the TAF represents the FAA's policy benchmark for federal review and approval of airport Master Plan forecasts. TAF projections are updated annually using federal fiscal year activity values.

Figure 3.4-8 and **Table 3.4-3** compare forecast GA operations with those published for SAT in the 2018 FAA TAF. The figure and table also include an adjusted TAF, which accounts for actual operations through 2017. The forecast operations differ from the TAF by no more than 5 percent over the first five years, and by less than 8 percent over the following fifteen years.

Figure 3.4-8: General Aviation Aircraft Operations Forecast - Master Plan vs. Terminal Area Forecast



Notes:

Adj. - Adjusted

Est. – Estimated

GA – General Aviation

TAF – Terminal Area Forecast

Sources: Airport Statistics, Federal Aviation Administration and Unison Consulting, Inc.

Table 3.4-3: General Aviation Aircraft Operations Forecast - Master Plan vs. Terminal Area Forecast

	Actual	Est.	Forecast			Compound Annual Growth Rate			
Measure/Scenario	**2017**	**2018**	**2023**	**2028**	**2038**	**2018-2023**	**2023-2028**	**2028-2038**	**2018-2038**
GA Total	46,662	47,913	48,509	49,123	50,407	0.2%	0.3%	0.3%	0.3%
Itinerant	46,415	47,479	48,068	48,674	49,942	0.2%	0.3%	0.3%	0.3%
Local	247	434	441	449	464	0.3%	0.3%	0.3%	0.3%
TAF	46,662	46,010	46,202	46,442	46,974	0.1%	0.1%	0.1%	0.1%
Adjusted TAF	46,662	47,913	48,163	48,413	48,917	0.1%	0.1%	0.1%	0.1%
Ratio GA Total-TAF	1.00	1.04	1.05	1.06	1.07				
Ratio GA Total-Adjusted TAF	1.00	1.00	1.01	1.01	1.03				

Notes:

Adj. - Adjusted

Est. – Estimated

GA – General Aviation

TAF – Terminal Area Forecast

Sources: Airport Statistics, Federal Aviation Administration and Unison Consulting, Inc.

3.5 SUMMARY OF MASTER PLAN AVIATION ACTIVITY FORECASTS AND COMPARISON WITH THE TERMINAL AREA FORECAST

Table 3.5-1 presents a summary of the forecasts of commercial and non-commercial aviation activity at SAT. Forecasts for passenger carrier and air cargo activity are provided under two scenarios, while forecasts for noncommercial operations are provided under one scenario. Noncommercial activity consists of GA and military operations.

Table 3.5-2 compares the designated Master Plan forecasts with the FAA TAF, adjusted to reflect actual performance in FY 2017, actual enplanements during the first seven months of FY 2018 (through April 2018), and estimated enplanements for the remainder of FY 2018 based on scheduled seats (Adjusted TAF). The designated Master Plan forecasts are well within the thresholds considered to be consistent with the FAA TAF, when compared with the Adjusted TAF:

- For forecast enplanements, the differences are no more than 2 percent through 2028, and no more than 4 percent through 2038.
- For forecast commercial aircraft operations, the differences are no more than 2 percent through 2028, and no more than 7 percent through 2038.
- For forecast noncommercial aircraft operations, the differences are no more than 3 percent through 2038.
- For forecast based aircraft, the differences are no more than 10 percent through 2028, and no more than 18 percent through 2038.

Table 3.5-1: Summary of Aviation Activity Forecasts

Commercial Aviation Activity

Enplanements (1,000s)

	Actual	Est.	Forecast			Compound Annual Growth Rate			
Measure/Scenario	2017	2018	2023	2028	2038	2018-2023	2023-2028	2028-2038	2018-2038
Master Plan	4,432	4,873	5,731	6,283	7,234	3.3%	1.9%	1.4%	2.0%
High Growth	4,432	4,873	5,891	6,759	8,349	3.9%	2.8%	2.1%	2.7%

Passenger Aircraft Operations (Air Carrier, Commuter & Air Taxi)

	Actual	Est.	Forecast			Compound Annual Growth Rate			
Measure/Scenario	2017	2018	2023	2028	2038	2018-2023	2023-2028	2028-2038	2018-2038
Master Plan	84,180	87,330	98,288	105,825	120,186	2.4%	1.5%	1.3%	1.6%
High Growth	84,180	87,330	101,030	113,587	138,033	3.0%	2.4%	2.0%	2.3%

Passenger Aircraft Landed Weight (1,000 lbs)

	Actual	Est.	Forecast			Compound Annual Growth Rate			
Scenario	2017	2018	2023	2028	2038	2018-2023	2023-2028	2028-2038	2018-2038
Master Plan	5,103	5,439	6,234	6,750	7,680	2.8%	1.6%	1.3%	1.7%
High Growth	5,103	5,439	6,394	7,235	8,817	3.3%	2.5%	2.0%	2.4%

Air Cargo - Enplaned and Deplaned Cargo (Metric Tons)

	Actual	Est.	Forecast			Compound Annual Growth Rate			
Measure/Scenario	2017	2018	2023	2028	2038	2018-2023	2023-2028	2028-2038	2018-2038
Master Plan	111,232	121,098	136,684	146,257	161,616	2.5%	1.4%	1.0%	1.5%
All-Cargo Carrier	107,139	116,784	131,404	140,382	154,788	2.4%	1.3%	1.0%	1.4%
Passenger Carrier (Belly)	4,094	4,314	5,281	5,875	6,828	4.1%	2.2%	1.5%	2.3%
High Growth	111,232	121,098	139,101	151,082	171,095	2.8%	1.7%	1.3%	1.7%
All-Cargo Carrier	107,139	116,784	133,670	144,908	163,679	2.7%	1.6%	1.2%	1.7%
Passenger Carrier (Belly)	4,094	4,314	5,431	6,174	7,416	4.7%	2.6%	1.8%	2.7%

All-Cargo Aircraft Operations

	Actual	Est.	Forecast			Compound Annual Growth Rate			
Measure/Scenario	2017	2018	2023	2028	2038	2018-2023	2023-2028	2028-2038	2018-2038
Master Plan	8,414	9,395	10,326	10,591	10,925	1.9%	0.5%	0.3%	0.8%
High Growth	8,414	9,395	10,376	10,749	11,276	2.0%	0.7%	0.5%	0.9%

All-Cargo Aircraft Landed Weight (1,000 lbs)

	Actual	Est.	Forecast			Compound Annual Growth Rate			
Scenario	2017	2018	2023	2028	2038	2018-2023	2023-2028	2028-2038	2018-2038
Master Plan	833	928	973	1,011	1,058	1.0%	0.8%	0.5%	0.7%
High Growth	833	928	990	1,044	1,119	1.3%	1.1%	0.7%	0.9%

Noncommercial Aviation Activity

Aircraft Operations

	Actual	Est.	Forecast			Compound Annual Growth Rate			
Measure/Scenario	2017	2018	2023	2028	2038	2018-2023	2023-2028	2028-2038	2018-2038
General Aviation	46,662	47,913	48,509	49,123	50,407	0.2%	0.3%	0.3%	0.3%
Itinerant	46,415	47,479	48,068	48,674	49,942	0.2%	0.3%	0.3%	0.3%
Local	247	434	441	449	464	0.3%	0.3%	0.3%	0.3%
Military	4,816	4,816	4,816	4,816	4,816	0.0%	0.0%	0.0%	0.0%
Based Aircraft	218	221	234	248	279	1.2%	1.2%	1.2%	1.2%

Note: Est. – estimated

Sources: San Antonio Department of Aviation, Federal Aviation Administration, and Unison Consulting, Inc.

Table 3.5-2: Comparison of the Designated Master Plan Forecast with the Terminal Area Forecast

Enplanements (1,000s)

	Actual	Est.	Forecast			Compound Annual Growth Rate			
Measure/Scenario	2017	2018	2023	2028	2038	2018-2023	2023-2028	2028-2038	2018-2038
Master Plan	4,432	4,873	5,731	6,283	7,234	3.3%	1.9%	1.4%	2.0%
TAF	4,300	4,664	5,184	5,608	6,618	2.1%	1.6%	1.7%	1.8%
Adjusted TAF	4,432	4,873	5,342	5,778	6,820	1.9%	1.6%	1.7%	1.7%
Ratio MP- TAF	1.03	1.04	1.11	1.12	1.09				
Ratio MP- Adjusted TAF	1.00	1.00	1.07	1.09	1.06				

Commercial Aircraft Operations

	Actual	Est.	Forecast			Compound Annual Growth Rate			
Measure/Scenario	2017	2018	2023	2028	2038	2018-2023	2023-2028	2028-2038	2018-2038
Master Plan	92,594	96,725	108,614	116,416	131,111	2.3%	1.4%	1.2%	1.5%
TAF	109,064	112,330	123,350	132,682	154,489	1.9%	1.5%	1.5%	1.6%
Adjusted TAF	92,594	95,134	105,218	114,944	136,976	2.0%	1.8%	1.8%	1.8%
Ratio MP- TAF	0.85	0.86	0.88	0.88	0.85				
Ratio MP- Adjusted TAF	1.00	1.02	1.03	1.01	0.96				

Noncommercial Aircraft Operations

	Actual	Est.	Forecast			Compound Annual Growth Rate			
Measure/Scenario	2017	2018	2023	2028	2038	2018-2023	2023-2028	2028-2038	2018-2038
Master Plan	51,478	52,729	53,325	53,939	55,223	0.2%	0.2%	0.2%	0.2%
TAF	51,478	50,671	50,911	51,151	51,635	0.1%	0.1%	0.1%	0.1%
Adjusted TAF	51,478	52,729	52,979	53,229	53,732	0.1%	0.1%	0.1%	0.1%
Ratio MP-TAF	1.00	1.04	1.05	1.05	1.07				
Ratio MP-Adjusted TAF	1.00	1.00	1.01	1.01	1.03				

Based Aircraft

	Actual	Est.	Forecast			Compound Annual Growth Rate			
Measure/Scenario	2017	2018	2023	2028	2038	2018-2023	2023-2028	2028-2038	2018-2038
Master Plan	218	221	234	248	279	1.2%	1.2%	1.2%	1.2%
TAF*	220	224	251	280	344	2.3%	2.2%	2.1%	2.2%
Adjusted TAF*	218	221	247	276	339	2.3%	2.2%	2.1%	2.2%
Ratio MP-TAF*	1.0	0.98	0.93	0.89	0.81				
Ratio MP-Adjusted TAF*	1.00	1.00	0.95	0.90	0.82				

Notes:

Est. – estimated

MP – Master Plan

TAF – Terminal Area Forecast

* 2018 published TAF used as reference (2019 draft TAF Based Aircraft forecast currently unavailable).

Sources: Federal Aviation Administration Terminal Area Forecast adjusted to reflect actuals in 2017 and estimates in 2018, Unison Consulting, Inc.

3.6 FORECAST RISK FACTORS

The forecasts are based on information available at the time of the study, measurable factors that drive air traffic, and assumptions about their future trends. The airport operates in a dynamic environment. Actual results could differ materially from the forecasts if any of the assumptions do not hold or if unexpected events cause traffic to decrease or increase significantly.

3.6.1 ECONOMIC CONDITIONS

National and regional economic conditions affect airport traffic trends. The national economy is a major driver of the regional economy as a whole, and it is an important determinant of air travel demand. Economic expansions increase income, boost consumer confidence, stimulate business activity, and increase demand. In contrast, economic recessions reduce income, diminish consumer confidence, dampen business activity, and weaken demand. Generally, air travel demand decreases during economic recessions and increases during economic recoveries and expansions. While the diversity of the regional economy helps temper the effects of business cycles, the regional economy can be vulnerable to a deep national economic recession.

The U.S. economy is now on its ninth year of expansion after the Great Recession. Driven by growth in consumer spending and business investment, the U.S. economy is predicted to continue growing over the next few years. While the probability of a recession in the near-term remains low, many factors within the country and abroad present economic risks. Sources of economic risks include significant economic policy changes, the high level of U.S. government and private debt, tightening monetary policy, the adverse effects of volatile oil prices on the U.S. energy and manufacturing sectors, and continuing political tensions abroad.

The longest economic expansion on record is the 10-year expansion in the 1990s. While the current economic expansion is on track to beat this record, eventually it will come to an end and another business cycle will begin. The Master Plan forecast period covers 20 years; at least one or two business cycles can take place over this period.

3.6.2 OIL PRICES AND JET FUEL PRICES

Oil prices affect one of the largest components of airline costs—jet fuel. The sharp increases in oil prices in the past decade caused sharp increases in jet fuel costs. The U.S. airline industry suffered huge financial losses, pushing many airlines into bankruptcy and prompting significant changes in airline operations and business practices. In contrast, the sharp decrease in oil prices since June 2014 has brought airlines windfall profits, allowing them to renew their fleets and invest in other service improvements.

World oil prices are slowly recovering. Since June 2017, they have been on a steady upward trend. U.S. airlines again face increases in jet fuel prices, although this time with more fuel-efficient fleet, more cost-efficient business operations, and better financial conditions.

3.6.3 AIRLINE FINANCIAL CONDITIONS AND CHANGES IN BUSINESS STRATEGIES

Airports face risks of air service capacity cuts when airlines encounter financial difficulties and change their business strategies, streamline their operations, enter into mergers, or go out of business altogether. Following the Great Recession, airlines cut system capacity. They cut flights and seats at some airports, and restrained growth in flights and seats offered at other airports. SAT was among those airports that saw decreases in flights and seats for a number of years during and after the last recession.

The U.S. airline industry is one of the most volatile industry sectors. It is vulnerable to economic downturns and sharp increases in oil prices. The 2000s was one of the most difficult periods for the U.S. airline industry. In that period, the U.S. airline industry faced two economic recessions, terrorist attacks, and sharp increases in fuel prices. The U.S. airline industry incurred losses during most years in the 2000s. Since 2010, the industry has been earning profits, reaping the benefits of lower fuel prices, capacity discipline, and traffic recovery along with global and U.S. economic recovery. Amid strong air travel demand, airlines have been able to raise airfares and earn substantial revenues from ancillary services. Profits have allowed airlines to renew and expand their fleets, and airports, including SAT, have begun to see increases in airline service.

3.6.4 AIRLINE MERGERS

U.S. airlines enter into mergers to strengthen their market and financial position, increase their resources, and expand their network. The most recent examples of large mergers include Delta Air Lines and Northwest Airlines in 2008, United Airlines and Continental Airlines in 2010, Southwest Airlines and AirTran Airways in 2011, American Airlines and US Airways in 2013, and Alaska Airlines and Virgin America in 2016. Airline mergers affect service and traffic at airports, when they consolidate facilities, optimize route networks, and route connecting traffic through other hubs. The impact on affected airports usually plays out within a few years—sometimes immediately—following the merger. The impact can be significant or trivial, depending upon whether the merging airlines have a large market share at an airport and whether they carry significant connecting traffic through the airport.

3.6.5 AIRLINE COMPETITION

Competition within the airline industry is intense and highly unpredictable—one of the main reasons for the volatility of the airline industry. Airlines compete on various factors including (1) pricing and cost structure, (2) routes, frequent flyer programs, schedules; and (3) customer service, operational reliability, and amenities. Airlines also face competition from other means of transportation and alternatives to travel such as video-conferencing and the internet.

Pricing is a significant competitive factor in the airline industry because airfares are an important consideration for customers when choosing flights. The internet has made it easy for customers to compare fares and identify competitor promotions and discounts. The significant growth of low- and ultra low-cost carriers (LCCs and ULCCs) has made price competition even more fierce. ULCCs are prompting changes in ticket pricing industrywide. ULCCs offer “a la carte” service offerings, promoting extremely low relative base fares while separately charging for related services and products. Certain major U.S. airlines have responded by introducing a new “Basic Economy” fare product, offering a lower base fare to compete with a ULCC base fare but with significant restrictions on related amenities and services. Price competition leads to lower fares, and lower fares stimulate growth in air travel demand. At SAT, the large presence of Southwest Airlines, the LCC leader, and the growing presence of ULCCs, keep ticket pricing in check.

3.6.6 AVIATION SECURITY, HEALTH AND SAFETY CONCERNS

Concerns about security, health, and safety influence consumer travel behavior. Even with tightened security measures implemented by the Department of Homeland Security, terrorism remains a serious threat to the aviation industry. Additionally, the stringent airport security screening and long waits at security screening lines discourage air travel particularly to destinations that can be reached by ground transportation within a reasonable amount of time. Health and safety concerns can also cause temporary dips in traffic on affected routes.

3.6.7 STRUCTURAL CHANGES IN TRAVEL DEMAND

Consumers alter their travel patterns in response to changes at airports, changes in airline business practices, and changes in technology. For example, the stringent airport security screening and long wait times at airports after the 2001 terrorist attacks decreased the demand for air travel for short-haul trips. Intense fare competition and the ease of comparison shopping allowed by the internet have made consumers more price-sensitive. The widespread use of tele- and videoconferencing has decreased the need for business travel.

San Antonio Airport System Strategic Development Plan

2021 AIRPORT MASTER PLAN

MASTER PLAN UPDATE
CHAPTER 3 – AVIATION DEMAND FORECASTS
APPENDIX 3A – COVID-19 ADJUSTMENTS TO FAA-APPROVED FORECAST

August 4, 2021

Ms. Sarah Conner
Program Manager, ASW-650
Texas Airports District Office
Federal Aviation Administration
10101 Hillwood Parkway
Fort Worth, Texas 76177

Re: Planning Forecast—Proposed Interim COVID Adjustment Approach
San Antonio International Airport Master Plan
Airport Improvement Program (AIP) Grant No: 3-48-0192-93-2019/100-2020

Dear Ms. Conner,

The City of San Antonio's (CoSA) Aviation Department is currently in the process of completing its Airport Master Plan (Master Plan) for the San Antonio International Airport (SAT or the Airport). The forecast for the Master Plan was approved during Phase I of the study in October 2018. Since then, the aviation industry has seen a dramatic reduction in activity and limited growth, due to the COVID-19 global pandemic, with a partial recovery to 2019 activity.

As discussed on June 29, 2021, the purpose of this letter is to provide the FAA with the proposed path forward for adjusting the approved planning forecast while we complete the remainder of our Master Plan. While the Master Plan's focus is on planning activity levels rather than activity years, the planning forecast also guides the timing for certain demand-driven projects and will be used to develop the financial projections in the plan's financial feasibility analysis. After the Master Plan is complete, we anticipate as recovery continues and we have a better understanding of aviation demand changes due to the COVID-19 pandemic, a completely new planning forecast will be prepared for FAA approval. This could be done in support of a benefit-cost analysis or a NEPA document preceding elements of our proposed development plan. However, until then, we need to consider the effects of the COVID-19 pandemic to date. Therefore, we are proposing an interim adjustment to our FAA-approved Master Pan forecast.

BASIS FOR PROPOSED INTERIM FORECAST COVID-19 PANDEMIC ADJUSTMENT

As we considered how to address a change to the forecast, we evaluated the following factors, that are discussed in more detail below:

- Status of the Master Plan
- Global and National Aviation Recovery
- SAT's Recovery

Master Plan Status

The current Master Plan schedule was delayed due to COVID and now has a substantially complete date of November 2021. At that time, the Master Plan will be presented to the CoSA City Council for acceptance/ adoption. Also, just prior to that presentation, the plan will be rolled out to the study committees, the CoSA Mayor's Airport System Development Committee (ASDC), and the community. Community engagement will include several pop-up public events, as well as a community meeting to present the plan to the public.

The Master Plan is likely to incur a delay as we continue to discuss our preferred airfield alternative with the FAA. Depending on the outcome of those discussions, activities during the next few months of the project include the development of the final implementation plan, financial feasibility analysis, and the airport layout plan and associated safety risk panel, as well as the Master Plan documentation.

Global Aviation COVID-19 Pandemic Recovery

It is still too early to determine when global aviation activity will fully recover from the impact of the slow-down in aviation activity due to the impact of COVID-19. Some aviation sources, including numerous airlines are currently bullish about recovery, estimating that as soon as 2023 the global aviation industry could reach 2019 levels. Others such as Boeing, are less optimistic with recovery to 2019 activity levels occurring in 2025 or later.

According to the International Air Transport Association's (IATA) most recent traffic statistics from April 2021, estimated North American available seat kilometers (ASKs-an indicator of system capacity) are approximately 30% less compared to 2019; while revenue passenger kilometers (RPKs-an indicator of system demand) are approximately 42% less during the same time period. These statistics compare to global decreases in ASKs and RPKs of 47% and 57%, respectively. Therefore, while the capacity of North American Market has decreased less than that of the global aviation market, the decrease in demand is slightly higher.

Thus far, the key driver of the aviation industry's recovery from the pandemic has been leisure travel. A recent article from McKinsey and Company entitled "Back to the Future? Airline Sector Poised for Change Post-COVID-19" dated April 2, 2021[1] indicates global aviation traffic will not likely recover from the effects of the pandemic until sometime in 2024. The same article indicates that leisure trips have and will continue to fuel the recovery post-pandemic. This is similar to what was experienced when the aviation industry recovered from both the impacts of the events of 9/11 and the Great Recession.

The idea that leisure travel will be the driving force behind aviation traffic recovery is supported by credit rating agency representatives who predict "low-cost, leisure-oriented airlines are likely to recover faster than network airlines that rely more heavily on business and international travelers". Further, a Study conducted by Ideaworks looked at the impacts of the pandemic on business travel and the study concludes

[1] https://www.mckinsey.com/industries/travel-logistics-and-infrastructure/our-insights/back-to-the-future-airline-sector-poised-for-change-post-covid-19#

"between 19% and 36% of airlines' business traffic base will not return to the skies". In addition, the CEO of United Airlines indicated in March 2021, the leisure market for the airline was back to nearly 100% of 2019 levels.

While it is predicted that recovery in the business market will be slower than leisure, what is less certain in the industry is the recovery of the long-haul international market. It could take until 2025 before this segment of the market recovers. This is especially true for markets in Europe, the Middle East and Asia more so than the markets in Latin and South America. While during the pandemic many European countries restricted travel from the U.S., travel to Mexico by air was unrestricted. It is expected the U.S. to Europe market will begin to gain strength in Summer 2021 as more vaccination program rollouts continue.

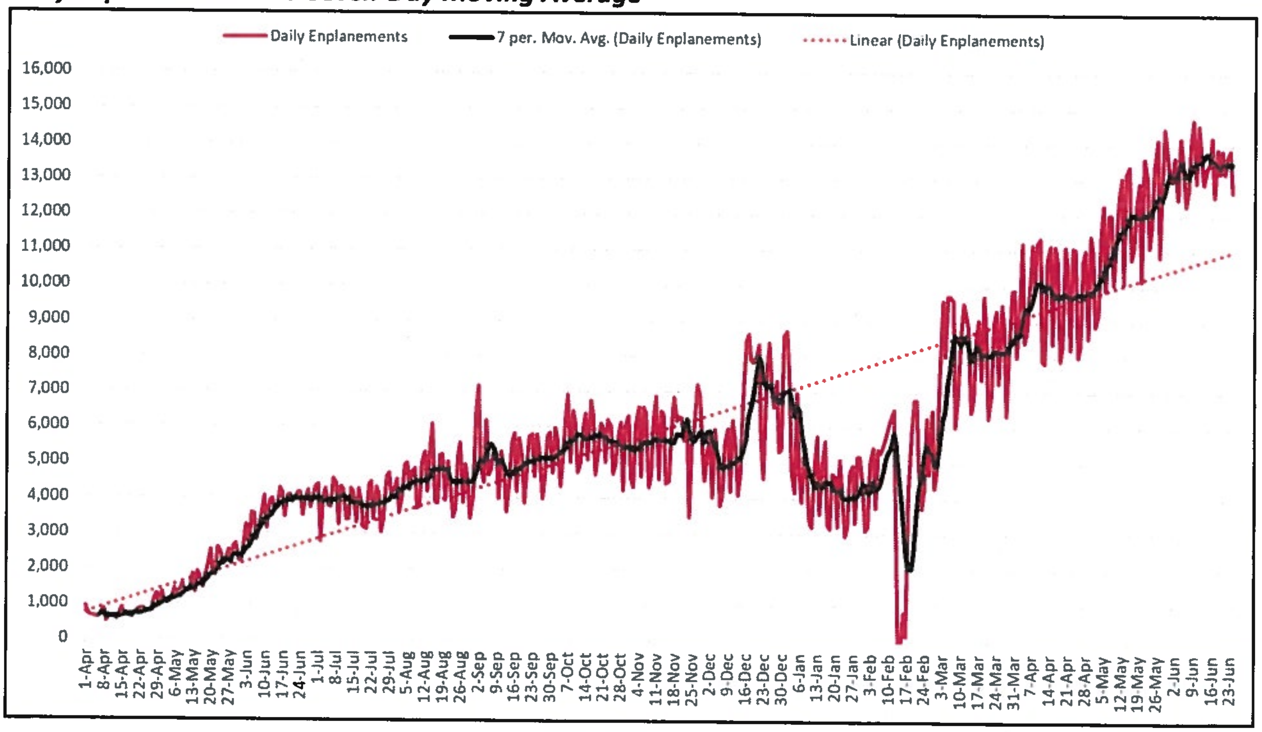
SAT's Recovery

SAAS has monitored actual activity at SAT since the beginning of the COVID-19 pandemic in the U.S. in March 2020 to determine how traffic trends at SAT are tracking with the U.S., as well as to measure against SAT activity in 2019. Several factors influenced the methodology proposed for the adjustment of the approved Master Plan aviation demand forecast:

- Passenger activity since March 2020
- Comparison of SAT's recovery with the nation and medium hub airports in the U.S.

SAAS has been monitoring passenger traffic weekly using TSA passenger statistics since late March 2020. As shown in the graph below, the seven-day moving average for enplanements has been trending upward since June 2020 and has been above the daily enplanement trendline, with the exception of a short period in early December 2020 and from January 2021 to March 2021, which is the airport's typically slowest period during the year and also included a closure at SAT due to weather in February.

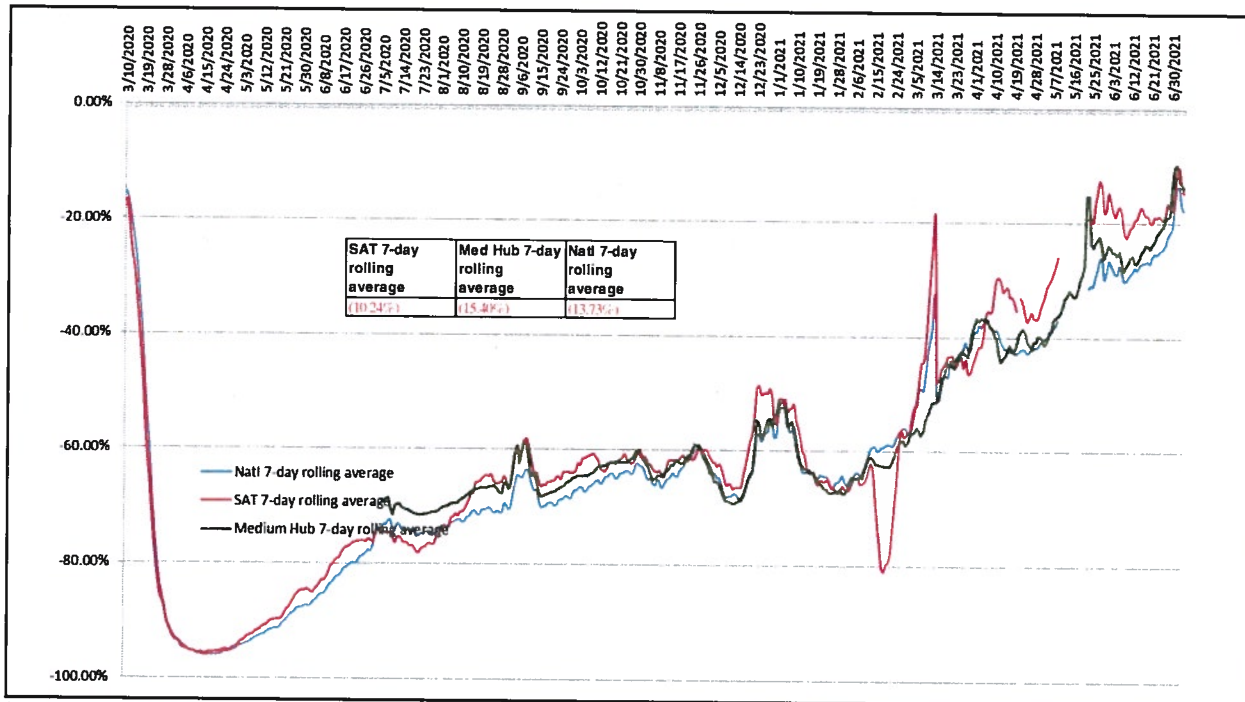
Daily Enplanements and Seven-Day Moving Average



Source: SAAS Airport Weekly Activity Report, week of June 20th through June 26th, 2021

SAT's enplanement activity recovery compared to the nation and other medium hub airports also provides a positive outlook. Since March 2020, SAT's passenger activity has shown lower decreases than that of its medium-hub counterparts and the nation. For the week ending June 26, 2021, SAT was down approximately 10% from 2019 levels, while medium hub airports and the nation were down approximately 15% and 14%, respectively.

Enplanement Decrease Comparison (2019 to current)



Source: SAAS Airport Weekly Activity Report, week of June 20th through June 26th, 2021

The two largest carriers at SAT, American Airlines and Southwest Airlines are expanding their networks in Summer 2021. American Airlines recently announced the introduction of over 150 new routes and expects to fly approximately 90% of its domestic seat capacity compared to Summer 2019. Southwest Airlines has announced numerous new flights and markets focusing on the leisure traveler to destinations like Myrtle Beach, SC; Bozeman, MT and routes to Tampa, FL. This bodes well for SAT, as these carriers are allowing for additional connection opportunities for the San Antonio traveler even though no new markets have direct flights at SAT. Other positive influences for SAT activity include JetBlue Airways' recent announcement for the initiation of service at SAT beginning in October 2021, which will include daily service to Boston Logan and John F. Kennedy International Airports.

Two recent trends are also expected to make travel projections more reliable through the end of 2021. While bookings have remained steady for the airlines, the number of cancellations is decreasing, despite the lack of cancellation fees. The average lead time for bookings is increasing, indicating passengers are more confident about future travel.

PROPOSED MASTER PLAN FORECAST ADJUSTMENT METHODOLOGY

For the Master Plan, three COVID-19 response options were considered:

- **Make no adjustment/continue using the 2018-approved Master Plan forecast**. We dismissed this approach as it ignores the impacts of COVID-19 on activity levels, as well as on permanent fleet changes that have been announced after the forecast was approved[2]. While the long-term outlook may not be that different from the current forecast, the short- and medium- term activity levels will likely differ significantly from the approved forecast. Therefore, we believe that some adjustment should be considered.

- **Prepare an all-new forecast for FAA review and approval**. This approach would require additional project effort and funding and would delay completion of the Master Plan, which was already delayed by approximately one year due to the COVID-19 pandemic. Additionally, the understanding of COVID-19-related impacts on future travel are still unfolding and FAA has issued guidance to limit forecasting efforts until there is more certainty of the aviation market. Therefore, a new Master Plan forecast could still require an update in the next several years, when SAAS seeks other required approvals, such as an Environmental assessment (EA) or benefit-cost analysis (BCA). As a result, we also felt this was not the best approach.
- **Prepare a limited, interim adjustment for the Master Plan, and develop a new forecast when we are closer to seeking other approvals (i.e., an EA or a BCA) to proceed with specific projects.** This appears to be the most prudent approach and is what we are proposing.

To evaluate the appropriate interim adjustment, our consultants compared a proposed interim enplanement forecast to the approved enplanement forecast and the enplanement forecast SAAS has been produced early in the COVID-19 pandemic. These are described below and compared in the following table.

- **Approved Master Plan Forecast**: Forecast approved in October 2018.
- **SAAS Forecast developed in April 2020**: Early in the pandemic, SAAS prepared a monthly activity forecast based on parameters developed by Airports Council International-North America (ACI-NA). It applied varying growth rates for near term recovery, regaining FY 2019 activity by FY 2024.
- **Updated SAAS Forecast with actual annual totals for FY 2019 and FY 2020**: This update includes actual activity through May 2021 and then applies monthly enplanement growth rate assumptions from the April 2020 forecast until FY 2019 activity is reached by December 2021.
- **Interim Adjustment Forecast**: This was prepared by our consultants and reflects that SAT's recovery has consistently outpaced the U.S. and other medium hub airports. This scenario projects that SAT will reach Fiscal Year (FY) 2019 levels in FY 2022.

[2] Note what these permanent fleet changes are and generally how they affect the forecast.

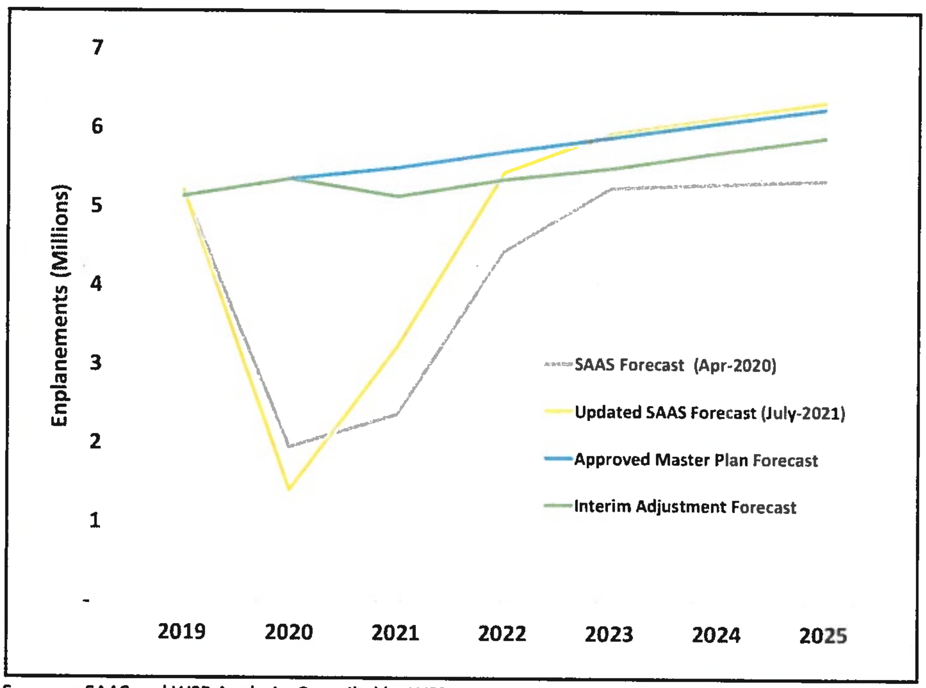
SAT Enplanement Forecast Comparison

Fiscal Year	Actual	SAAS Forecast (Apr-2020)	Updated SAAS Forecast (July-2021) *	Approved Master Plan Forecast	Interim Adjustment Forecast
2019	5,209,039	5,209,039	5,209,039	5,132,533	5,132,533
2020	1,404,485	1,961,203	1,404,485	5,349,157	5,349,157
2021		2,365,393	3,228,824	5,495,520	5,132,533
2022		4,439,293	5,441,633	5,700,398	5,349,157
2023		5,237,468	5,942,200	5,890,784	5,495,520
2024		5,289,843	6,138,292	6,070,987	5,700,398
2025		5,342,741	6,340,856	6,251,630	5,890,784

Sources: SAAS and WSP Analysis; Compiled by WSP.

* Updated SAAS Forecast includes actual activity through May 2021 and then applies the monthly enplanement growth rate assumptions from SAAS Forecast until enplanements reach the annual 2019 level in 2023. At that point, the long-term growth rate from the Approved Master Plan Forecast (2%) was applied.

SAT Forecast Comparison



Sources: SAAS and WSP Analysis; Compiled by WSP.

Given the positive outlook expected for the Summer 2021, it is likely that actual enplanements for FY 2021 will be higher than projected in the Updated SAAS Forecast, meaning enplanements will catch up with the FY 2019 levels faster than FY 2023 as shown in the table and chart above.

As a result of this positive outlook, SAAS proposes to make an interim forecast adjustment or shift - of enplanement activity by two years. The interim forecast will be used to determine the timing of certain demand-driven projects and to develop financial projections for the Master Plan. This would result in the Master Plan Forecast FY 2022 forecast being used for FY 2024. This is similar to the FAA-approved approach used in the development of the future conditions map for the ongoing Noise Exposure Map (NEM) update.

If this approach is reasonable, our consultants will also update the future aircraft fleet mix and commercial passenger operations forecast. As part of the NEM work, adjustments to the fleet mix were made to account for permanent aircraft retirements and these will be used in this interim planning forecast adjustment.

CONCLUSION

We considered three different approaches to the development of an adjustment to the Master Plan forecast as we conclude the study. We believe that a two-year forecast shift, combined with the aircraft fleet mix update completed as part of the NEM update, is the most prudent interim approach to reflecting the impacts of the global COVID-19 pandemic for near-term adjustments for long-term planning purposes. In the next several years, we expect to prepare a new forecast for FAA acceptance as part of seeking nearer-term approvals, such as environmental documentation or a BCA.

We request your concurrence with our proposed interim forecast adjustment approach for the remainder of our master plan.

Thank you for this consideration. Our project team will be happy to talk with you further to answer any questions you may have on our reasoning or approach.

Sincerely,

Jesus H. Saenz, Jr., IAP
Director of Airports
San Antonio Airport System

cc: Jesse Carriger, Michael Branum, Jessica Bryan – FAA
Tom Bartlett, David Robbins, Debbie Drew, Susan St. Cyr, Ryan Hall – SAT

From: Conner, Sarah (FAA)
To: Susan St Cyr (Aviation)
Cc: Bryan, Jessica L (FAA); Ryan Hall (Aviation)
Subject: [EXTERNAL] RE: SAT Master Plan - Planning Forecast Adjustment Approach for approval
Date: Monday, August 16, 2021 8:21:45 AM

Hi Susan

We approve the use of the interim forecast adjustment approach for the remainder of the Master Plan Study.

Please let me know if you have any questions!

Thanks!

Sarah Conner
Community Planner
Texas ADO

From: Susan St Cyr (Aviation) <Susan.StCyr@sanantonio.gov>
Sent: Friday, August 13, 2021 4:42 PM
To: Conner, Sarah (FAA) <Sarah.Conner@faa.gov>
Cc: Bryan, Jessica L (FAA) <jessica.l.bryan@faa.gov>; Ryan Hall (Aviation) <Ryan.Hall@sanantonio.gov>
Subject: RE: SAT Master Plan - Planning Forecast Adjustment Approach for approval

Good afternoon Sarah,
I'm following up on whether you have any questions or concerns on our approach, and if there is any indication of timing for a formal response.

I realize that this is late on a Friday so I am hoping it will be waiting for you fresh and early on Monday morning

Susan St. Cyr, P.E., C.M.
Special Projects Manager
San Antonio Airport System

From: Susan St Cyr (Aviation)
Sent: Friday, August 6, 2021 1:04 PM
To: Sarah.Conner@faa.gov
Cc: Carriger, Jesse (FAA) <jesse.carriger@faa.gov>; Branum, Michael (FAA) <Michael.Branum@faa.gov>; Jessica L. Bryan (jessica.l.bryan@faa.gov) <jessica.l.bryan@faa.gov>; Jesus Saenz (Aviation) <Jesus.Saenz@sanantonio.gov>; Thomas Bartlett (Aviation) <Thomas.Bartlett@sanantonio.gov>; David Robbins (Aviation) <David.Robbins@sanantonio.gov>; Debbie Drew (Aviation) <Debbie.Drew@sanantonio.gov>; Ryan Hall (Aviation) <Ryan.Hall@sanantonio.gov>

Subject: SAT Master Plan - Planning Forecast Adjustment Approach for approval

Sarah,
On behalf of Jesus Saenz, please find attached a technical memo outlining our proposed approach to adjust our approved SAT Master Plan forecast. Please let us know if there are any questions on our reasoning and proposed approach.

Susan St. Cyr, P.E., C.M.
Special Projects Manager
San Antonio Airport System
(210) 207-3559 Office
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