# CHAPTER TWO FORECASTS

An important factor in facility planning begins with defining the expected needs of the airport over the specified planning period. In airport master planning, this involves projecting potential aviation activity for a 20-year timeframe. For Santa Fe Municipal Airport, aviation demand forecasting will consider commercial passenger service projections, general aviation forecasts for based aircraft, and aircraft operational activity projections by aggregate annualized totals and by specific categories. These will serve as the basis for facility planning and needs of the airport through the year 2035.

***The objective of forecasting is to predict the magnitude of change expected over the next two decades.***

The objective of forecasting is to predict the magnitude of change expected over the next two decades. Aviation activity can be affected by many influences on the local, regional, and national levels, making it virtually impossible to predict year-to-year fluctuations of activity over 20 years with any certainty. Therefore, it is important to remember that forecasts serve as guidelines, and planning must remain flexible enough to respond to a range of unforeseen developments.

The Federal Aviation Administration (FAA) has oversight responsibility to review and approve aviation forecasts developed in conjunction with airport planning studies. The FAA reviews individual airport forecasts with the objective of comparing them to its *Terminal Area Forecast* (TAF) and the *National Plan of Integrated Airport Systems* (NPIAS). In addition, aviation activity forecasts provide important input to the benefit-cost analyses associated with airport development, and FAA reviews these analyses when federal funding requests are submitted.

Only two components of a Master Plan are approved by the FAA: the aviation demand forecasts and the Airport Layout Plan (ALP). The ALP will be updated later in this study.

FAA Order 5090.3C, *Field Formulation of the National Plan of Integrated Airport Systems*, dated December 4, 2004, states that forecasts should be:

- Realistic;
- Based on the latest available data;
- Reflective of current conditions at the airport;
- Supported by information in the study; and
- Able to provide adequate justification for airport planning and development

The forecast process for an Airport Master Plan consists of a series of basic steps that vary in complexity depending upon the issues to be addressed and the type of airport being studied. The steps include a review of previous forecasts, determination of data needs, identification of data sources, collection of data, selection of forecast methods, preparation of the forecasts, and evaluation and documentation of the results. FAA Advisory Circular (AC) 150/5070-6B, *Airport Master Plans*, outlines seven standard steps involved in the forecast process, including:

1) **Identify Aviation Activity Measures**: The level and type of aviation activities likely to impact facility needs. For general aviation, this typically includes based aircraft and operations.

2) **Review Previous Airport Forecasts**: May include the FAA *Terminal Area Forecast*, state or regional system plans, and previous master plans.

3) **Gather Data**: Determine what data is required to prepare the forecasts, identify data sources, and collect historical and forecast data.

4) **Select Forecast Methods**: There are several appropriate methodologies and techniques available, including regression analysis, trend analysis, market share or ratio analysis, exponential smoothing, econometric modeling, comparison with other airports, survey techniques, cohort analysis, choice and distribution models, range projections, and professional judgment.

5) **Apply Forecast Methods and Evaluate Results**: Prepare the actual forecasts and evaluate for reasonableness.

6) **Summarize and Document Results**: Provide supporting text and tables as necessary.

7) **Compare Forecast Results with FAA's TAF**: Follow guidance in FAA Order 5090.3C, *Field Formulation of the National Plan of Integrated Airport Systems*. In part, the Order indicates that forecasts should not vary significantly (more than 10 percent) from the TAF. When there is a greater than 10 percent variance, supporting documentation should be supplied to the FAA.

Aviation activity can be affected by many influences on the local, regional, and national levels, making it virtually impossible to predict year-to-year fluctuations of activity over 20 years with any certainty. Therefore, it is important to remember that forecasts are to serve only as guidelines, and planning must remain flexible enough to respond to a range of unforeseen developments.

The following forecast analysis for Santa Fe Municipal Airport was produced following these basic guidelines. Existing forecasts are examined and compared against current and historic activity. The historical aviation activity is then examined along with other factors and trends that can affect demand. The intent is to provide an updated set of aviation demand projections for the airport that will permit airport management to make planning adjustments as necessary to maintain a viable, efficient, and cost-effective facility.

***It is important to remember that forecasts are to serve only as guidelines, and planning must remain flexible enough to respond to a range of unforeseen developments.***

## *NATIONAL AVIATION TRENDS AND FORECASTS*

Each year, the FAA updates and publishes a national aviation forecast. Included in this publication are forecasts for the large air carriers, regional/commuter air carriers, general aviation, and FAA workload measures. The forecasts are prepared to meet budget and planning needs of the FAA and to provide information that can be used by state and local authorities, the aviation industry, and the general public. The current edition when this chapter was prepared was FAA *Aerospace Forecasts – Fiscal Years 2015-2035*, published in March 2015. The FAA primarily uses the economic performance of the United States as an indicator of future aviation industry growth. Similar economic analyses are applied to the outlook for aviation growth in international markets. The following discussion is summarized from the FAA Aerospace Forecasts.

Since its deregulation in 1978, the U.S. commercial air carrier industry has been characterized by boom-to-bust cycles. The volatility that was associated with these cycles was thought by many to be a structural feature of an industry that was capital intensive but cash poor. However, the great recession of 2007-09 marked a fundamental change in the operations and finances of U.S airlines. Air carriers fine-tuned their business models to minimize losses by lowering operating costs, eliminating unprofitable routes, and grounding older, less fuel efficient aircraft. To increase operating revenues, carriers initiated new services that customers were willing to purchase and started charging separately for services that were historically bundled in the price of a ticket. The industry experienced an unprecedented period of consolidation with four major mergers in five years. These changes along with capacity discipline exhibited by carriers have resulted in a fifth consecutive year of profitability for the industry in 2014. Looking ahead, there is optimism that the industry has been transformed from that of a boom-to-bust cycle to one of sustainable profits.

***Air carriers fine-tuned their business models to minimize losses by lowering operating costs, eliminating unprofitable routes, and grounding older, less fuel efficient aircraft.***

## U.S. ECONOMIC OUTLOOK

According to the FAA forecast report, as the economy recovers from the most serious economic downturn and slow recovery since the Great Depression, aviation will continue to grow over the long run. Fundamentally, demand for aviation is driven by economic activity. As economic growth picks up, so will growth in aviation activity. The FAA forecast calls for passenger growth over the next 20 years to average 2.0 percent annually. The steep decline in the price of oil in 2014 and into 2015 is a catalyst for a short lived uptick in passenger growth; however, growth is anticipated to be somewhat muted, primarily due to the uncertainty that surrounds the U.S. and global economies.

U.S. economic performance in 2014 continued to be mixed, with modest growth in real gross domestic product (GDP) and real incomes, a slowly falling unemployment rate, and oil prices and consumer inflation remaining in check. The economy grew at an average annual rate of 2.6 percent in fiscal year (FY) 2014 after expanding 1.8 percent in FY 2013. GDP growth was strong in the second half of 2014 after shrinking in the second quarter primarily due to adverse weather conditions spurred on by the polar vortex. There were favorable signs in 2014 as the housing market continued to improve, the stock market entered record territory, and the labor market saw steady improvement with almost 2.8 million new jobs created during the year, the best figure since 1999. The unemployment rate fell steadily throughout 2014 from 7.2 percent to 5.6 percent by December.

In the medium term, (the three-year period between 2016 and 2019), U.S. economic growth is projected to average 2.6 percent per year, with rates ranging between 2.4 and 2.7 percent. Income growth picks up during the same period, averaging 3.2 percent per year. For the balance of the forecast period, annual average growth of U.S. real GDP and real income slow to around 2.4 and 2.5 percent, respectively. The long-term stability of U.S. economic growth depends on sustained growth in the workforce and capital stock, along with improved productivity and competitiveness.

***The long-term stability of U.S. economic growth depends on sustained growth in the workforce and capital stock, along with improved productivity and competitiveness.***

## U.S. TRAVEL DEMAND

By year end of federal FY 2014, the U.S. commercial aviation industry consisted of 16 scheduled mainline air carriers that used large passenger jets (over 90 seats) and 70 regional carriers that used smaller piston, turboprop, and regional jet aircraft (up to 90 seats) to provide connecting passengers to the larger carriers. Mainline and regional carriers offer domestic and international passenger service between the U.S. and foreign destinations, although regional carrier international service is confined to the border markets in Canada, Mexico, and the Caribbean. Twenty-six all-cargo carriers were providing domestic and/or international air cargo service at the end of 2014.

According to the FAA, shaping today's commercial air carrier industry are three distinct trends: (1) continuing industry consolidation and restructuring; (2) continued capacity discipline in response to external shocks; and (3) the proliferation of ancillary revenues.

The restructuring and consolidation of the U.S. airline industry that began in the aftermath of the terror attacks of September 11, 2001 continued in 2014. During 2014, Southwest continued to integrate the former AirTran network into its operations, while American and U.S. Airways moved ahead with combining their networks and reservation systems. Consequently, when compared to 2007, 5.7 percent fewer domestic available seat miles (ASMs) were flown and 2.9 percent fewer passengers were carried domestically in 2014. This has had clear implications with both the average size of aircraft and load factors increasing.

One of the most striking outcomes of industry restructuring has been the unprecedented period of capacity discipline (achieving higher passenger loads through scheduled flight and fleet mix consolidation primarily), especially in domestic markets. Between 1978 and 2000, ASMs in domestic markets increased at an average annual rate of four percent per year, recording only two years of decline. Even though domestic ASMs shrank by 6.9 percent in FY 2002, following the events of September 11, 2001, growth resumed and by FY 2007, domestic ASMs were 3.6 percent above the FY 2000 level. However, since FY 2007, ASMs in the U.S. domestic market have decreased by 5.7 percent, as the industry responded first to the sharp rise in oil prices (up 155 percent between 2004 and 2008) and then the Great Recession that followed (2008-2009).

The 5.7 percent reduction in domestic capacity since 2007 has not been shared equally between the mainline carriers and their regional counterparts. To better match demand to capacity, the mainline carriers contracted out "thin" routes to their regional counterparts because they could provide lift at a lower cost, or simply removed the capacity altogether. In 2014, the mainline carrier group provided 6.3 percent less capacity than it did in 2007 (and carried 3.6 percent fewer passengers). Capacity flown by the regional group has shrunk by 1.9 percent over the same five-year period (with passengers carried decreasing by 0.7 percent).

The most recent trend to take hold is that of ancillary revenues. Carriers generate ancillary revenues by selling products and services beyond that of an airplane ticket to customers. This includes the un-bundling of services previously included in the ticket price, such as checked bags and on-board meals, and by adding new services, such as boarding priority. As a result of capacity reduction and the introduction of ancillary revenue sources, U.S. passenger carriers posted net profits for the fifth consecutive year in 2014.

***As a result of capacity reduction and the introduction of ancillary revenue sources, U.S. passenger carriers posted net profits for the fifth consecutive year in 2014.***

## FAA COMMERCIAL AIR CARRIER FORECASTS

Although the recession has been officially over for several years, in 2014, carriers continued to deal with economic uncertainties as business travel budgets remained strained, unemployment was still high relatively high compared to pre-recession years, and uncertainty surrounding federal fiscal policy remained. In such an uncertain but slowly improving economic environment, industry capacity growth was somewhat restrained (up 2.2 percent in 2014), after only a 0.8 percent increase in 2013. Given the minimal increase in seats available to the traveling public, carriers were still able to raise airfares despite the slow growth in demand. Higher airfares and ancillary revenue, coupled with flat to falling fuel prices, resulted in U.S. carriers being profitable in 2014.

According to the FAA, system capacity is projected to increase modestly (up 2.4 percent) in 2015. In the domestic market, mainline carrier capacity expanded only slightly (1.8 percent) in 2014, but is projected to grow at a more robust rate (2.6 percent) in 2015, while capacity for the regional carriers is projected to post its first increase since FY 2011 (up 4.0 percent). In the international sector, capacity is forecast to increase slowly in the Atlantic and Pacific markets and increase modestly in the Latin market, resulting in an overall international capacity increase of 1.6 percent in 2015.

Passenger demand growth is in line with capacity growth in 2015, with system revenue passenger miles (RPMs) forecast to grow 2.6 percent. Supported by a growing U.S. and world economy, year over year RPM growth is forecast to be 2.5 percent on average over the period from 2015-2035. Over the same time period, system capacity growth averages 2.5 percent per year.

***System passengers are projected to increase an average of 1.9 percent a year, with mainline carriers growing at 2.0 percent a year, slightly higher than their regional counterparts (up 1.6 percent).***

System passengers are projected to increase an average of 1.9 percent a year, with mainline carriers growing at 2.0 percent a year, slightly higher than their regional counterparts (up 1.6 percent). By 2035, U.S. commercial air carriers are projected to fly 1.71 trillion ASMs and transport 1.14 billion enplaned passengers – a total of 1.44 trillion passenger miles.

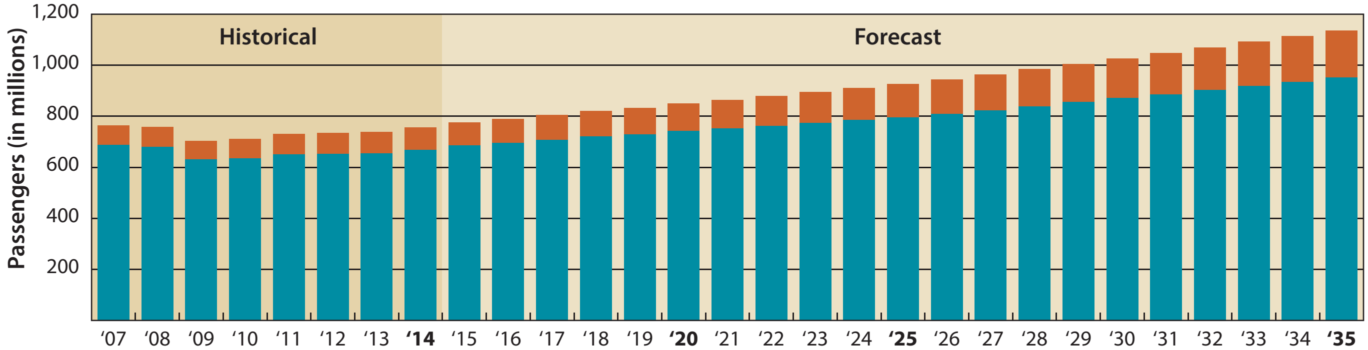
Planes will remain crowded, with load factors projected to grow moderately during the early years of the forecast period, then tapering during the mid to latter years to 84.2 percent in 2035 (up 0.6 points compared to the beginning of the forecast period in 2015).

The FAA forecasts indicate that enplanements are forecast to grow (up 2.6 percent) in 2015, following a 2.1 percent increase in 2014. Over the forecast period, domestic enplanements are projected to grow at an average annual rate of 1.7 percent, with mainline and regional carriers growing at the same rate. **Exhibit 2A** presents the annual historical and forecast enplanement totals for both large air carriers and commuter airlines in the U.S. as forecast by the FAA.

## FAA COMMERCIAL AIRCRAFT FLEET FORECASTS

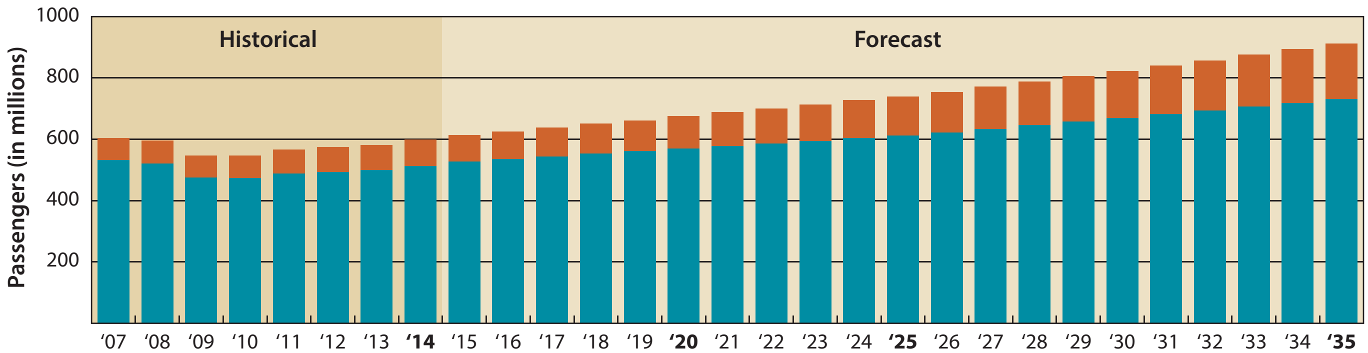
The commercial passenger carrier fleet is undergoing transformation. The mainline carriers are retiring older, less fuel-efficient aircraft (e.g., 737-300/400/500, 757/767, and MD-80) and replacing them with more technologically advanced A319/320 and 737-700/800/900 aircraft. The regional carriers are growing their fleet of 70-90 seat regional jet aircraft and reducing their fleet of 50-seat jet aircraft. The total number of aircraft in the U.S. commercial fleet (including regional carriers) is estimated at 6,727 for 2014, a decrease of 86 aircraft from 2013. This total includes 3,774 mainline air carrier passenger aircraft

## U.S. AIR CARRIER PASSENGER ENPLANEMENTS[1]



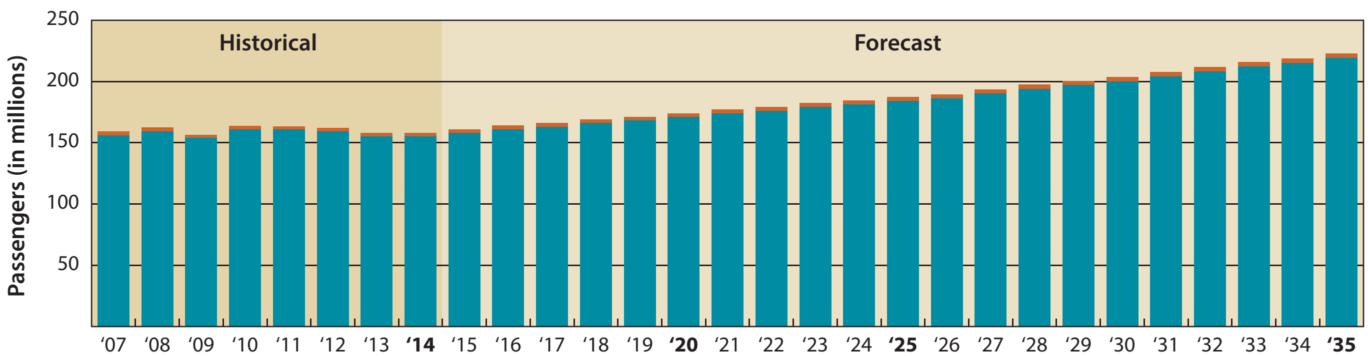

| SOURCE | 2014 | 2020 | 2025 | 2035 | AAGR 2014-2035 |
|---|---|---|---|---|---|
| Domestic Revenue Enplanements | 668.4 | 742.0 | 796.6 | 951.0 | 1.69% |
| International Revenue Enplanements | 88.0 | 109.1 | 130.8 | 185.5 | 3.61% |
| TOTAL | 756.3 | 851.1 | 927.4 | 1,136.5 | 1.96% |

## U.S. MAINLINE AIR CARRIER PASSENGER ENPLANEMENTS




| SOURCE | 2014 | 2020 | 2025 | 2035 | AAGR 2014-2035 |
|---|---|---|---|---|---|
| Domestic Revenue Enplanements | 513.2 | 570.5 | 612.7 | 731.7 | 1.70% |
| International Revenue Enplanements | 85.1 | 105.9 | 127.4 | 181.4 | 3.67% |
| TOTAL | 598.3 | 676.4 | 740.2 | 913.1 | 2.03% |

## U.S. REGIONAL AIR CARRIER PASSENGER ENPLANEMENTS




| SOURCE | 2014 | 2020 | 2025 | 2035 | AAGR 2014-2035 |
|---|---|---|---|---|---|
| Domestic Revenue Enplanements | 155.2 | 171.5 | 183.9 | 219.3 | 1.66% |
| International Revenue Enplanements | 2.9 | 3.2 | 3.4 | 4.0 | 1.54% |
| TOTAL | 158.1 | 174.6 | 187.3 | 223.3 | 1.66% |

[1]Sum of U.S. Mainline and Regional Air Carrier Enplanements
Note: All figures measured in millions

*Source: FAA Aerospace Forecast - Fiscal Years 2015-2035*



**Exhibit 2A: U.S. COMMERCIAL AIR CARRIER FORECASTS**

(over 90 seats), 740 mainline air cargo aircraft, and 2,213 regional carrier aircraft (jets, turboprops, and pistons).

The number of passenger jets in the mainline fleet is estimated to have increased by 41 in 2014. After 2014, the mainline aircraft fleet was projected to add approximately 64 aircraft annually, totaling 5,112 aircraft in 2035. The mainline narrow-body fleet (including the Embraer 190s) was projected to grow by 42 aircraft annually from 2015-2035. The wide-body fleet (including the Boeing 787 and Airbus A-350) was projected to grow by 24 aircraft annually over the same period. Mainline passenger jet aircraft are forecast to increase 1.5 percent annually through 2034.

The regional passenger aircraft fleet is estimated to have decreased by 86 aircraft in 2014, as decreases in 50-seat and smaller regional jets and turboprops outpace production of new larger regional jets. After 2014, the regional carrier fleet (turboprops and jets) is expected to decrease by 0.2 percent per year over the remaining years of the forecast period, totaling 2,141 aircraft in 2035. The number of regional jets (90 seats or fewer) is projected to grow from 1,642 in 2014 to 1,953 in 2034, an average annual increase of 0.8 percent. All of the growth in regional jets over the forecast period occurs in the larger, 70- to 90-seat aircraft category. During the forecast period, all regional jets of 50 or less seats are projected to be retired from the fleet.

***All of the growth in regional jets over the forecast period occurs in the larger, 70- to 90-seat aircraft category. During the forecast period, all regional jets of 50 or less seats are projected to be retired from the fleet.***

Large cargo jet aircraft are forecast to grow from an estimate of 740 in 2014 to a total 1,182 aircraft in 2035. The narrow-body, cargo jet fleet is projected to increase by two aircraft per year over the 20-year forecast period as older 757s and 737s are converted to cargo service. The wide-body, cargo jet fleet is projected to increase by 14 aircraft annually. **Exhibit 2B** presents the FAA commercial aircraft fleet forecast through 2035.

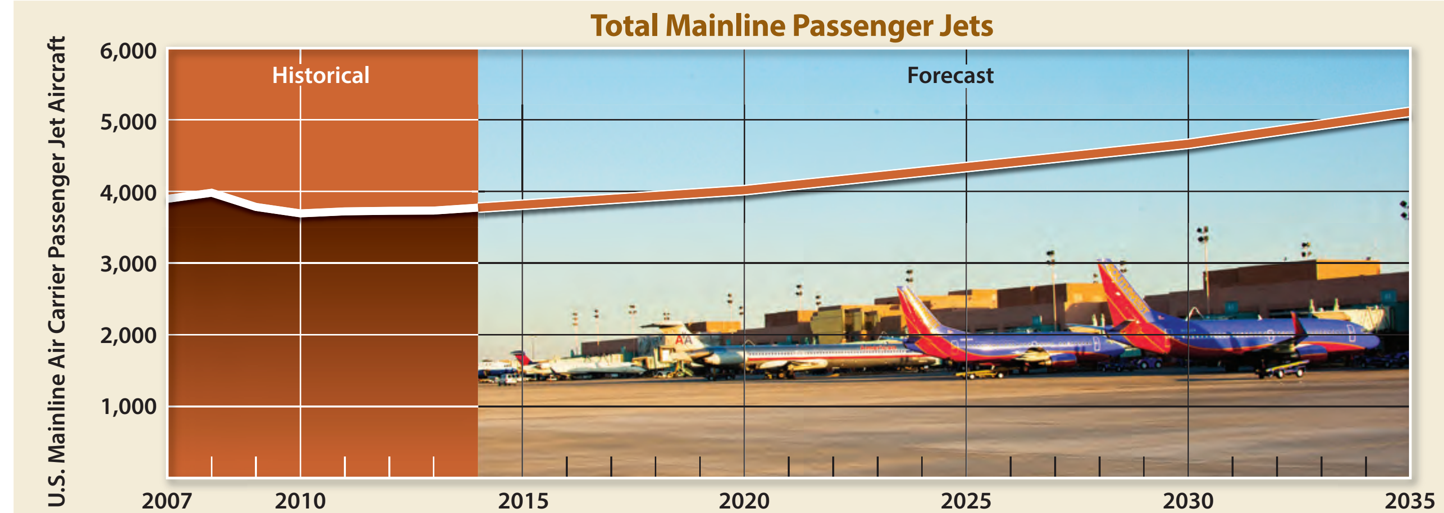
## FAA GENERAL AVIATION FORECASTS

The FAA forecasts the fleet mix and hours flown for single engine piston aircraft, multi-engine piston aircraft, turboprops, business jets, piston and turbine helicopters, light sport, experimental, and others (gliders and balloons). The FAA forecasts "active aircraft," not total aircraft. An active aircraft is one that is flown at least one hour during the year. From 2010 through 2013, the FAA undertook an effort to have all aircraft owners re-register their aircraft. This effort resulted in a 10.5 percent decrease in the number of active general aviation aircraft, mostly in the piston category.

After growing rapidly for most of the decade, the demand for business jet aircraft slowed over the past few years, as the industry was hard hit by the 2008-2009 economic recession. Nonetheless, the FAA forecast calls for growth through the long-term, driven by higher corporate profits and continued concerns about safety, security, and flight delays. Overall, business aviation is projected to outpace personal/recreational use.

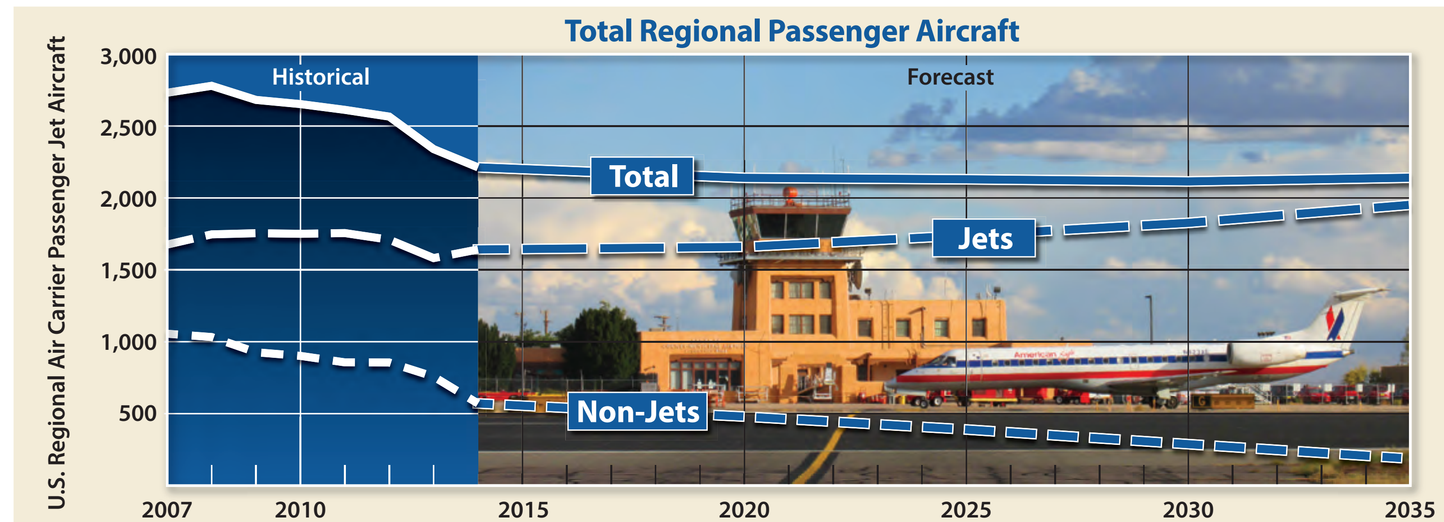
## U.S. MAINLINE AIR CARRIER PASSENGER JET AIRCRAFT

| | 2014 | 2020 | 2025 | 2035 | AAGR 2014-2035 |
|---|---|---|---|---|---|
| **Large Narrow Body** | | | | | |
| 2 Engine | 3,155 | 3,291 | 3,512 | 4,016 | 1.16% |
| 3/4 Engine | 5 | 5 | 0 | 0 | 0.00% |
| **Large Wide Body** | | | | | |
| 2 Engine | 481 | 594 | 731 | 983 | 3.46% |
| 3/4 Wide Body | 40 | 31 | 0 | 0 | 0.00% |
| **Total Large Jets** | **3,681** | **3,921** | **4,243** | **4,999** | **1.47%** |
| **Total Regional Jets** | **93** | **97** | **97** | **113** | **0.93%** |
| **Total Mainline Passenger Jets** | **3,774** | **4,018** | **4,340** | **5,112** | **1.46%** |




## U.S. REGIONAL AIR CARRIER PASSENGER JET AIRCRAFT

| | 2014 | 2020 | 2025 | 2035 | AAGR 2014-2035 |
|---|---|---|---|---|---|
| **Less than 30 Seats** | | | | | |
| Turboprop | 483 | 388 | 293 | 79 | -8.26% |
| **31-40 Seats** | | | | | |
| Turboprop | 37 | 30 | 22 | 6 | -8.30% |
| **Over 40 Seats** | | | | | |
| Turboprop | 51 | 62 | 75 | 103 | 3.40% |
| Jet | 1,642 | 1,660 | 1,740 | 1,953 | 0.83% |
| **Non-Jet Total** | **571** | **480** | **390** | **188** | **-5.15%** |
| **Jet Total** | **1,642** | **1,660** | **1,740** | **1,953** | **0.83%** |
| **Total Regional Passenger Aircraft** | **2,213** | **2,140** | **2,130** | **2,141** | **-0.16%** |




## U.S. ALL CARGO JET AIRCRAFT

| | 2014 | 2020 | 2025 | 2035 | AAGR 2014-2035 |
|---|---|---|---|---|---|
| **Large Narrow Body** | | | | | |
| 2 Engine | 191 | 213 | 243 | 306 | 2.27% |
| 3/4 Engine | 15 | 13 | 0 | 0 | 0.00% |
| **Large Wide Body** | | | | | |
| 2 Engine | 296 | 356 | 439 | 628 | 3.65% |
| 3/4 Engine | 238 | 239 | 219 | 248 | 0.20% |
| **Total All Cargo Jets** | **740** | **821** | **901** | **1,182** | **2.26%** |

*Source: FAA Aerospace Forecast - Fiscal Years 2015-2035*

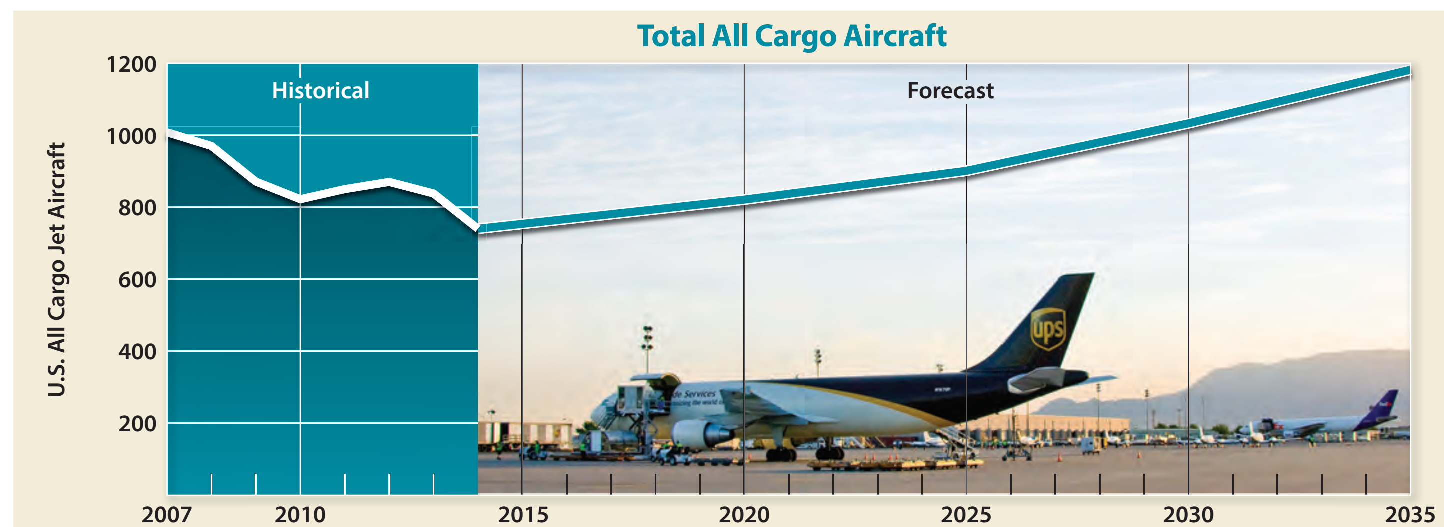





**Exhibit 2B**
**NATIONAL U.S. COMMERCIAL FLEET FORECAST**

This page intentionally left blank

*Overall, business aviation is projected to outpace personal/recreational use.*

In 2014, the FAA estimated there were 139,890 piston-powered aircraft in the national fleet. The total number of piston-powered aircraft in the fleet is forecast to decline by 0.5 percent from 2014-2035, resulting in 125,935 by 2035. This includes -0.6 percent annually for single engine pistons and -0.4 percent for multi-engine pistons.

Total turbine aircraft are forecast to return to growth in 2014 and have an annual growth rate of 2.4 percent through 2035. The FAA estimates there were 28,085 turbine-powered aircraft in the national fleet in 2014, and there will be 45,905 by 2035. This includes annual growth rates of 1.5 percent for turboprops, 2.8 percent for business jets, and 2.8 percent for turbine helicopters.

While comprising a much smaller portion of the general aviation fleet, experimental aircraft, typically identified as home-built aircraft, are projected to grow annually by 1.4 percent through 2035. The FAA estimates there were 24,480 experimental aircraft in 2014, and these are projected to grow to 33,040 by 2035. Sport aircraft are forecast to grow 4.3 percent annually through the long term, growing from 2,200 in 2014 to 5,360 by 2035. **Exhibit 2C** presents the historical and forecast U.S. active general aviation aircraft.

The FAA also forecasts total operations based upon activity at control towers across the United States. Operations are categorized as air carrier, air taxi/commuter, general aviation, and military. General aviation operations, both local and itinerant, declined significantly as a result of the 2008-2009 recession and subsequent slow recovery. Through 2035, total general aviation operations are forecast to grow 0.4 percent annually. Air taxi/commuter operations are forecast to decline by 3.6 percent through 2024, and then increase slightly through the remainder of the forecast period. Overall, air taxi/commuter operations are forecast to decline by 1.2 percent annually from 2014 through 2035.

## GENERAL AVIATION AIRCRAFT SHIPMENTS AND REVENUE

As previously discussed, the 2008-2009 economic recession has had a negative impact on general aviation aircraft production, and the industry has been slow to recover. Aircraft manufacturing declined for three straight years from 2008 through 2010. According to the General Aviation Manufacturers Association (GAMA), there is optimism that aircraft manufacturing will stabilize and return to growth, which has been evidenced since 2011. **Table 2A** presents historical data related to general aviation aircraft shipments.

Worldwide shipments of general aviation airplanes increased for the fourth year in a row in 2014. A total of 2,445 units were delivered around the globe, as compared to 2,345 units in 2013. Worldwide general aviation billings were also higher than the previous year.

**Business Jets:** General aviation manufacturers delivered 722 business jets in 2014, as compared to 678 units in 2013. Similar to 2013, demand was stronger in 2014 for large-cabin business jets than it was for medium and light business jets.

**Turboprops:** In 2014, 603 turboprop airplanes were delivered to customers around the world, a slight decline from the 645 delivered in 2013. Overall, the turboprop market has experienced significant gains since 2010.

**Pistons:** Piston deliveries increased from 1,022 units during 2013 to 1,129 in 2014. The piston segment continued to fare best for unit deliveries among the three segments by which GAMA tracks the airplane manufacturing industry. This is due in part by deliveries to flight schools in emerging markets.

***Most industry observers believe that the general aviation market, particularly the business aviation market, is in a position for sustained growth.***

Most industry observers believe that the general aviation market, particularly the business aviation market, is in a position for sustained growth. Industry net orders are back to positive and most leading indicators continue to improve. The large jet category of the market is expected to expand faster than the other categories.

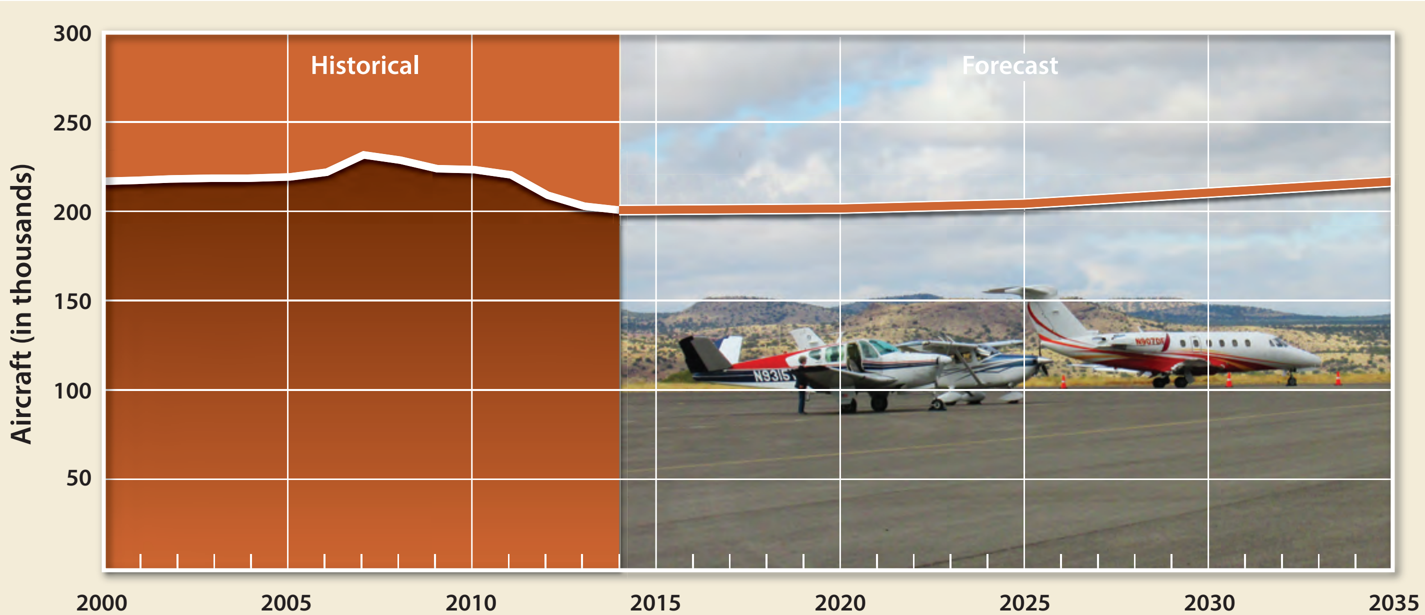
**TABLE 2A**
**Annual General Aviation Airplane Shipments**
**Manufactured Worldwide and Factory Net Billings**

| Year | Total | SEP | MEP | TP | J | Net Billings ($millions) |
|---|---|---|---|---|---|---|
| 1994 | 1,132 | 544 | 77 | 233 | 278 | 3,749 |
| 1995 | 1,251 | 605 | 61 | 285 | 300 | 4,294 |
| 1996 | 1,437 | 731 | 70 | 320 | 316 | 4,936 |
| 1997 | 1,840 | 1043 | 80 | 279 | 438 | 7,170 |
| 1998 | 2,457 | 1508 | 98 | 336 | 515 | 8,604 |
| 1999 | 2,808 | 1689 | 112 | 340 | 667 | 11,560 |
| 2000 | 3,147 | 1,877 | 103 | 415 | 752 | 13,496 |
| 2001 | 2,998 | 1,645 | 147 | 422 | 784 | 13,868 |
| 2002 | 2,677 | 1,591 | 130 | 280 | 676 | 11,778 |
| 2003 | 2,686 | 1,825 | 71 | 272 | 518 | 9,998 |
| 2004 | 2,963 | 1,999 | 52 | 321 | 591 | 11,918 |
| 2005 | 3,590 | 2,326 | 139 | 375 | 750 | 15,156 |
| 2006 | 4,053 | 2,513 | 242 | 412 | 886 | 18,815 |
| 2007 | 4,276 | 2,417 | 258 | 465 | 1,136 | 21,837 |
| 2008 | 3,970 | 1,943 | 176 | 538 | 1,313 | 24,772 |
| 2009 | 2,279 | 893 | 70 | 446 | 870 | 19,474 |
| 2010 | 2,020 | 781 | 108 | 368 | 763 | 19,715 |
| 2011 | 2,120 | 761 | 137 | 526 | 696 | 19,097 |
| 2012 | 2,133 | 790 | 91 | 580 | 672 | 18,873 |
| 2013 | 2,345 | 900 | 122 | 645 | 678 | 23,450 |
| 2014 | 2,445 | 986 | 143 | 603 | 722 | 24,499 |

SEP - Single Engine Piston; MEP - Multi-Engine Piston; TP - Turboprop; J - Turbofan/Turbojet
*Source: General Aviation Manufacturers Association 2013 Statbook; 2014 data from Year End Report.*

## U.S. ACTIVE GENERAL AVIATION AIRCRAFT

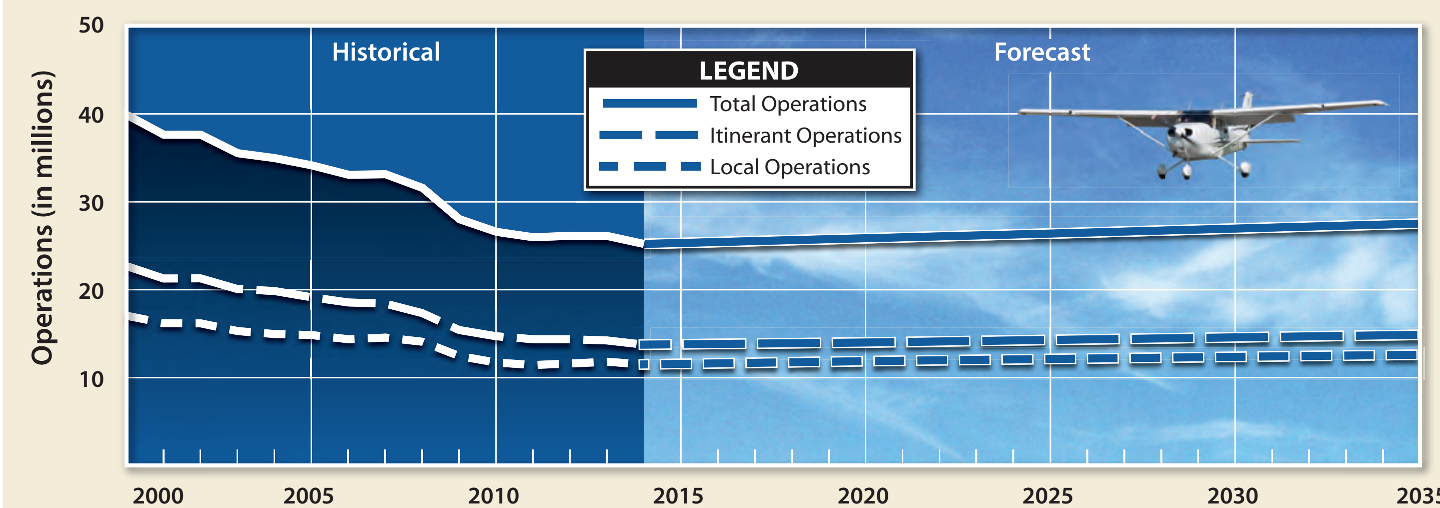
| | 2014 | 2020 | 2025 | 2035 | AAGR 2014-2035 |
|---|---|---|---|---|---|
| **Fixed Wing** | | | | | |
| **Piston** | | | | | |
| Single Engine | 123,440 | 117,770 | 113,905 | 108,810 | -0.60% |
| Multi-Engine | 13,215 | 12,920 | 12,545 | 12,135 | -0.41% |
| **Turbine** | | | | | |
| Turboprop | 9,485 | 9,315 | 9,855 | 12,970 | 1.50% |
| Turbojet | 11,750 | 13,115 | 15,000 | 20,815 | 2.76% |
| **Rotorcraft** | | | | | |
| Piston | 3,235 | 3,785 | 4,165 | 4,990 | 2.09% |
| Turbine | 6,850 | 8,410 | 9,595 | 12,120 | 2.75% |
| **Experimental** | | | | | |
| | 24,480 | 26,795 | 28,875 | 33,040 | 1.44% |
| **Sport Aircraft** | | | | | |
| | 2,200 | 3,170 | 3,970 | 5,360 | 4.33% |
| **Other** | | | | | |
| | 4,205 | 4,130 | 4,060 | 4,020 | -0.21% |
| **Total Pistons** | **139,890** | **134,475** | **130,615** | **125,935** | **-0.50%** |
| **Total Turbines** | **28,085** | **30,840** | **34,450** | **45,905** | **2.37%** |
| **Total Fleet** | **198,860** | **199,410** | **201,970** | **214,260** | **0.36%** |




Notes: An active aircraft is one that has a current registration and was flown at least one hour during the calendar year.

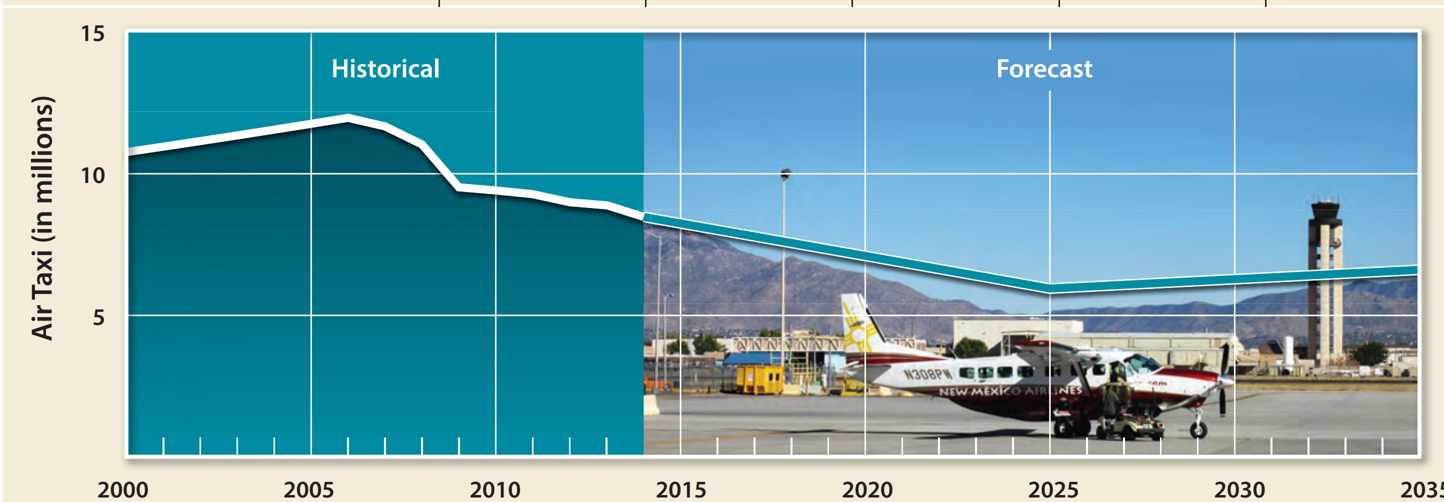
## U.S. GENERAL AVIATION OPERATIONS

| | 2014 | 2020 | 2025 | 2035 | AAGR 2014-2035 |
|---|---|---|---|---|---|
| **Itinerant** | | | | | |
| | 13,977,500 | 14,209,500 | 14,499,400 | 15,118,400 | 0.37% |
| **Local** | | | | | |
| | 11,674,100 | 12,048,000 | 12,298,900 | 12,834,800 | 0.45% |
| **Total GA Operations** | **25,651,600** | **26,257,500** | **26,798,200** | **27,953,200** | **0.41%** |




## U.S. GENERAL AVIATION AIR TAXI

| | 2014 | 2020 | 2025 | 2035 | AAGR 2014-2035 |
|---|---|---|---|---|---|
| **Air Taxi/Commuter Operations** | | | | | |
| Itinerant | 8,439,300 | 7,075,700 | 5,918,500 | 6,580,200 | -1.18% |




*Source: FAA Aerospace Foreast - Fiscal Years 2015-2035*



**Exhibit 2C**
**NATIONAL GENERAL AVIATION/AIR TAXI FORECASTS**

This page intentionally left blank

## AIRPORT SERVICE AREA

The initial step in determining the aviation demand for an airport is to define its generalized service area for various segments of aviation the airport can accommodate. The service area is determined primarily by evaluating the location of competing airports, their capabilities, their services, and their relative attraction and convenience. In determining the aviation demand for an airport, it is necessary to identify the role of the airport as well as the specific areas of aviation demand the airport is intended to serve. For Santa Fe Municipal Airport, the primary civilian roles are to accommodate commercial passenger airline service as well as general aviation demand in the region.

The service area for an airport is a geographic region from which an airport can be expected to attract the largest share of its activity. The definition of the service area can then be used to identify other factors, such as socioeconomic and demographic trends, which influence aviation demand at the airport. Moreover, aviation demand will be impacted by the proximity of competing airports, the surface transportation network, and the strength of commercial airline and/or general aviation services provided by the airport and competing airports.

As in any business enterprise, the more attractive the facility is in terms of service and capabilities, the more competitive it will be in the market. If an airport's attractiveness increases in relation to nearby airports, so will the size of its service area. If facilities and services are adequate and/or competitive, some level of aviation activity might be attracted to the airport from more distant locales.

### COMMERCIAL SERVICE

As of June 2015, Santa Fe Municipal Airport was one of only eight airports in the state with scheduled commercial air service. A ninth, nearby Los Alamos County Airport, had commercial service until it was suspended in January 2015. It has recently been considering a new carrier, and will likely have service again in the fall of 2015. The airfield design limitations of the airport in Los Alamos will generally restrict future commercial air service to 19-seat or smaller, with service primarily to Albuquerque for its connections to other airlines.

In 2014, 94 percent of the scheduled commercial air service passengers boarding in the state did so at Albuquerque International Sunport, which is located approximately 59 miles southwest of Santa Fe Municipal Airport and approximately 66 miles from the Santa Fe Central Business District (CBD). As a medium hub airport, the Sunport offers non-stop jet service to 18 cities nationwide, and had 83 daily flights in 2014. It is served by all the "big four" major airlines (American, Delta, Southwest, and United) as well as Alaska Airlines and JetBlue. Thus, the service at Albuquerque International Sunport will generally provide greater schedule flexibility, choice of airlines, more non-stop destinations, and potentially lower fares.

*The primary service area for Santa Fe Municipal Airport encompasses Santa Fe and the northern two-thirds of Santa Fe County, as well as Los Alamos and the Espanola area.*

While many travelers from the Santa Fe area utilize the Sunport, the area has proven to have sufficient demand to support regional jet service in recent years. **Exhibit 2D** depicts Santa Fe Municipal Airport in relation to the Sunport and north central New Mexico counties. The primary service area for Santa Fe Municipal Airport encompasses Santa Fe and the northern two-thirds of Santa Fe County, as well as Los Alamos and the Espanola area. Portions of Rio Arriba, Taos, Colfax, Mora, and San Miguel Counties may be considered as a secondary service area, although in competition with the air service options available in Albuquerque.

## GENERAL AVIATION

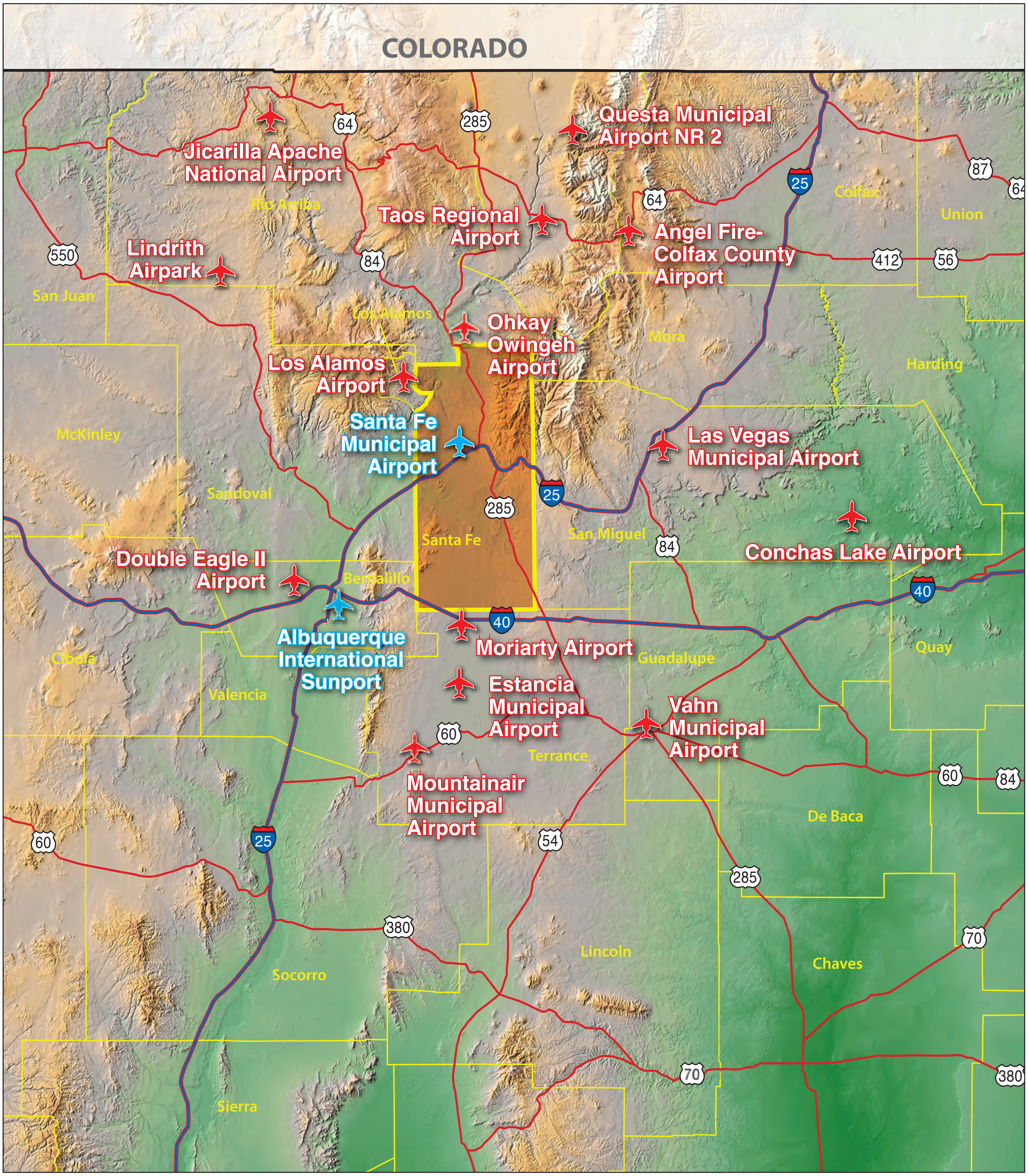
General aviation is the term used to describe a diverse range of aviation activities which includes all segments of the aviation industry, with the exception of commercial air carriers and military. General aviation is the largest component of the national aviation system and includes common activities such as pilot training, recreational flying, agricultural applications, medical support, and other business and corporate uses. General aviation aircraft can range from small glider and single engine aircraft to large turboprop and jet powered aircraft. In fact, some larger commercial airline aircraft models such as the Boeing 737, known as the Boeing Business Jet (BBJ), have been converted to private general aviation uses. Moreover, many retired military aircraft are now in service with general aviation functions.

Typically, the general aviation service area for regionalized airports can range from a minimum of 30 miles, extending up to approximately 50 miles. The proximity and level of general aviation services are largely the defining factors when describing the general aviation service area. A description of airports within an approximate 50-nautical mile radius of Santa Fe Municipal Airport was discussed in Chapter One. Seven public-use airports were included in this proximity to Santa Fe Municipal Airport.

Santa Fe Municipal Airport's location in the central portion of Santa Fe County adjacent to the City of Santa Fe makes it an important facility serving the needs of general aviation in the county. Existing airport facilities, including three runways, with its primary runway providing 8,366 feet of length, precision instrument approach capabilities, high quality aviation service providers, and abundant hangar space situates Santa Fe Municipal Airport as the region's premier general aviation option.

When discussing the general aviation service area, another primary demand segment that needs to be addressed is an airport's ability to attract based aircraft. As long as reasonably priced hangars and aviation services are offered, most aircraft owners and operators will choose to base at an airport near their home or business. As a result, the general aviation service area will tend to be more compact than a commercial service area. The corporate aviation component of the service area can extend a bit farther, depending on competing airports.

A generalized 50-mile radius around the airport extends into seven nearby counties. **Exhibit 2E** depicts the location of registered aircraft in the region in 2014. As depicted, the majority of registered aircraft




LEGEND

General Aviation Airport

Commercial Service Airport



Exhibit 2D
AIRPORT SERVICE AREA

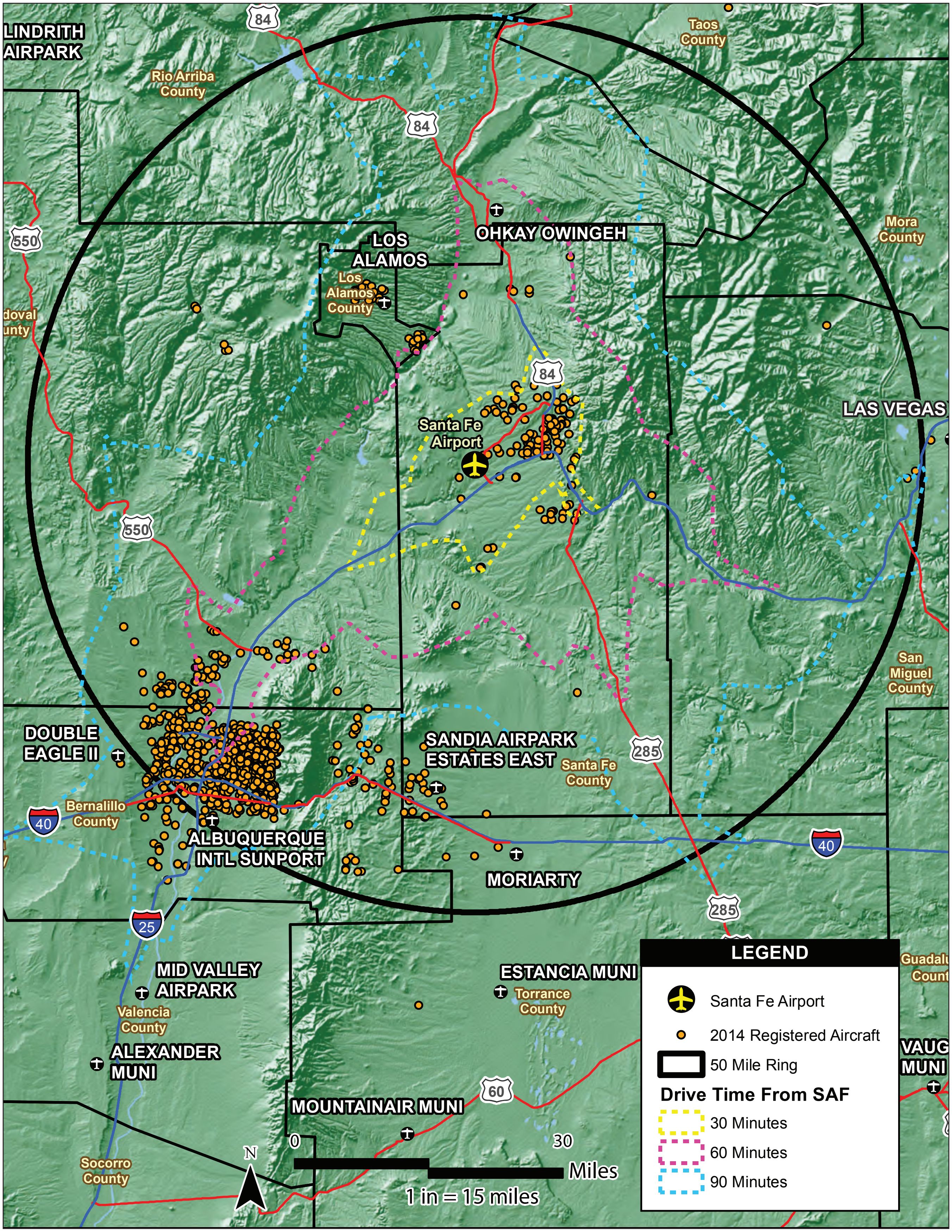





Exhibit 2E
REGISTERED AIRCRAFT IN AREA

are concentrated in and around regional population centers. In fact, most are located very close to an existing airport.

All significant population centers outside of Santa Fe County are served by local general aviation airports. While these airports may have more limited facilities and offer fewer services, they are much closer to the local aircraft owners and airport users. Proximity to an airport is typically the most important aviation demand factor for general aviation activity. Most general aviation operators will elect to operate at a closer airport unless facilities or services cannot be provided. For example, limited runway length could prohibit corporate users from operating at Los Alamos Airport, so they could choose Santa Fe Municipal Airport instead. Another example could include an aircraft operator choosing a more distant airport location for more preferable rate and fee structures.

For planning purposes, the primary general aviation service area for Santa Fe Municipal Airport will be Santa Fe County. Airports serving the population centers in nearby counties will effectively limit the service area. Furthermore, Los Alamos Airport, located northwest of Santa Fe in Los Alamos County, will limit general aviation demand coming from the north. Likewise, Sandia Airpark Estates East Airport and Double Eagle II Airport within the City of Albuquerque could limit some demand coming from the south. **Exhibit 2D** presents the competing general aviation airports in proximity to Santa Fe Municipal Airport.

***For planning purposes, the primary general aviation service area for Santa Fe Municipal Airport will be Santa Fe County.***

## *SOCIOECONOMIC TRENDS*

The socioeconomic conditions for the area provide an important baseline for preparing aviation demand forecasts. Local socioeconomic variables such as population, employment, and income are indicators for understanding the dynamics of the county and, in particular, the trends in aviation growth. Socioeconomic data for Santa Fe County and the Santa Fe Metropolitan Statistical Area (MSA), which are the same reporting entity, is presented in **Table 2B**. The data was obtained from the U.S. Census Bureau, University of New Mexico Bureau of Business and Economic Research, and Woods & Poole Complete Economic and Demographic Data Set (CEDDS) prepared in 2015.

### POPULATION

Total resident population for the Santa Fe County/MSA in 2014 is estimated at 150,061. As presented in the table, the county experienced an average annual growth rate (AAGR) of 1.05 percent since 2000. The population for the area is forecast to increase to 182,410 by 2035, representing a 0.93 percent AAGR over the planning period. For comparative purposes, population for the State of New Mexico has experienced a 1.06 percent AAGR since 2000, with a projected AAGR increase of 1.23 percent over the planning period.

***The population for the area is forecast to increase to 182,410 by 2035, representing a 0.93 percent AAGR over the planning period.***

**TABLE 2B**
**Socioeconomic Projections**

| | HISTORICAL | | | | PROJECTIONS | | | |
|---|---|---|---|---|---|---|---|---|
| | 2000 | 2010 | 2014 | AAGR (2000-2014) | 2020 | 2025 | 2035 | AAGR (2014-2035) |
| **Santa Fe County/MSA** | | | | | | | | |
| Population | 129,713 | 144,508 | 150,061 | 1.05% | 164,006 | 171,905 | 182,410 | 0.93% |
| Employment | 80,855 | 86,514 | 88,808 | 0.67% | 100,135 | 109,690 | 128,805 | 1.79% |
| PCPI | $38,537 | $40,516 | $41,945 | 0.61% | $45,929 | $49,442 | $55,628 | 1.35% |
| **State of New Mexico** | | | | | | | | |
| Population | 1,821,204 | 2,059,192 | 2,110,540 | 1.06% | 2,351,724 | 2,487,227 | 2,727,118 | 1.23% |
| Employment | 961,571 | 1,059,190 | 1,098,762 | 0.96% | 1,214,824 | 1,311,609 | 1,501,276 | 1.50% |
| PCPI | $28,169 | $32,636 | $34,111 | 1.38% | $37,490 | $40,514 | $45,791 | 1.41% |

AAGR - Average Annual Growth Rate
PCPI - Per Capita Personal Income (adjusted to 2009 dollars)

Source: Population - U.S. Census Bureau and University of New Mexico Bureau of Business and Economic Research; Employment and PCPI - Woods & Poole Complete Economic and Demographic Data Source (2015)

### EMPLOYMENT

Historical and forecast employment data for the Santa Fe County/MSA and the State of New Mexico are also presented. Between 2000 and 2014, Santa Fe County employment grew by an average of 0.67 percent annually. This growth rate was lower than the state's overall AAGR of 0.96 percent. Through the next 20 years, the County/MSA's employment is forecast to grow at a quicker pace than what has been experienced since 2000. The state's employment is also forecast to increase at a higher rate when compared to the past 14 years.

### PER CAPITA PERSONAL INCOME

The table also compares per capita personal income (PCPI), adjusted to 2009 dollars, for the County/MSA and the state. Santa Fe County's adjusted PCPI for 2014 was $41,945, significantly higher than the State of New Mexico's PCPI at $34,111. The County/MSA is projected to continue to show gains in PCPI through the planning period of this study, increasing at a 1.35 percent AAGR.

## *FORECASTING APPROACH*

The development of aviation forecasts proceeds through both analytical and judgmental processes. A series of mathematical relationships is tested to establish statistical logic and rationale for projected growth. However, the judgment of the forecast analyst, based upon professional experience, knowledge of the aviation industry, and assessment of the local situation, is important in the final determination of the preferred forecast.

The most reliable approach to estimating aviation demand is through the utilization of more than one analytical technique. Methodologies frequently considered in the aviation industry include trend line projections, correlation/regression analysis, and market share analysis. By developing several projections for each aviation demand indicator, a reasonable planning envelope will emerge. The selected forecast may be one of the individual projections or a combination of several projections based on local conditions. The selected forecast will almost always fall within the planning envelope. Some combination of the following forecasting techniques is utilized to develop the planning envelope for each demand indicator.

***Trend line projections*** are probably the simplest and most familiar of the forecasting techniques. By fitting growth curves to historical demand data, then extending them into the future, a basic trend line projection is produced. A basic assumption of this technique is that outside factors will continue to affect aviation demand in much the same manner as in the past. As broad as this assumption may be, the trend line projection does serve as a reliable benchmark for comparing other projections.

***Correlation analysis*** provides a measure of the direct relationship between two separate sets of historic data. Should there be a reasonable correlation between the data, further evaluation using regression analysis may be employed.

***Regression analysis*** measures the statistical relationship between dependent and independent variables, yielding a "correlation coefficient." The correlation coefficient (Pearson's "r") measures associations between the changes in a dependent variable and independent variable(s). If the r-squared ($r^2$) value (coefficient determination) is greater than 0.90, it indicates good predictive reliability. A value below 0.90 may be used with the understanding that the predictive reliability is lower.

***Market share analysis*** involves a historical review of aviation activity as a percentage, or share, of a larger regional, state, or national aviation market. A historical market share trend is determined providing an expected market share for the future. These shares are then multiplied by the forecasts of the larger geographical area to produce a market share projection. This method has the same limitations as trend line projections, but can provide a useful check on the validity of other forecasting techniques.

It is important to note that forecasts will age, and the further a forecast is from the base year, the less reliable it may become, particularly due to changing local and national conditions. Nonetheless, the FAA indicates that a Master Plan include a 20-year forecast for the airport. Facility and financial planning usually require at least a 10-year view, since it often takes more than five years to complete a major facility development program. However, it is important to use forecasts which do not overestimate revenue-generating capabilities or understate demand for facilities needed to meet public (user) needs.

A wide range of factors is known to influence the aviation industry and can have significant impacts on the extent and nature of air service provided in both the local and national markets. Technological advances in aviation have historically altered, and will continue to change, the growth rates in aviation demand over time. The most obvious example is the impact of jet aircraft on the aviation industry, which resulted in a growth rate that far exceeded expectations. Such changes are difficult, if not impossible, to predict, and there is simply no mathematical way to estimate their impacts.

Using a broad spectrum of local, regional, and national socioeconomic and aviation information and analyzing the most current aviation trends, forecasts are presented for the following demand indicators:

COMMERCIAL SERVICE
- Annual Enplaned Passengers
- Operations and Fleet Mix

GENERAL AVIATION
- Based Aircraft
- Based Aircraft Fleet Mix
- Aircraft Operations

PEAKING CHARACTERISTICS
- Airline Activity
- General Aviation and Other Air Taxi Activity

OTHER AIR TAXI AND MILITARY
- Aircraft Operations

ANNUAL INSTRUMENT APPROACHES

## *COMMERCIAL SERVICE FORECASTS*

For the first 30 years after deregulation of the airline industry, air service at Santa Fe Municipal Airport was primarily comprised of regional/commuter service by turboprop aircraft. In June 2009, after 18 months without any scheduled commercial service at the airport, American Eagle began non-stop flights to Dallas-Ft. Worth International (DFW) with 44- and 50-seat regional jets. By the end of the first full year (2010) of the new service, passenger activity had been restored to the airport's previous high level of over 43,500 boardings in 2000. Since that time, enplanements have grown to an all-time high of 74,551 in 2014.

***In June 2009, after 18 months without any scheduled commercial service at the airport, American Eagle began non-stop flights to Dallas-Ft. Worth International (DFW) with 44- and 50-seat regional jets.***

The regional jet service was the first scheduled commercial jet service at the airport in nearly 40 years. From 1967 through early 1970, Trans-Texas Airways operated DC-9 service into Santa Fe. Trans-Texas Airways later changed its name to Texas International and discontinued jet service to Santa Fe. The airport's enplanements peaked at 17,168 in 1968 with that service, a level of traffic that was not surpassed until 1996. Traffic then grew to 43,589 enplanements in 2000. At that time, Great Lakes Airlines, operating as United Express, was providing up to 11 daily flights to Denver with 19-seat Beech 1900 turboprops. The next year appeared headed to another new high until the events of September 11, 2001. Great Lakes Airlines lost its contract to operate as United Express in 2002. Although the airline continued to serve Santa Fe independently, the loss of the interlining connections in Denver with United impacted the passenger count, and Great Lakes discontinued service in December 2007.

## ENPLANEMENT FORECASTS

**Table 2C** depicts the annual enplaned passengers at Santa Fe Municipal Airport since 1995. As mentioned above, prior to deregulation in 1979, the airport's highest annual enplanement level was 17,168 in 1968. This was exceeded every year from 1996 to a high of 43,687 in 2000. The events of 9-11 and an accompanying recession led to a period of uncertainty for many airports relying on regional carrier service. Enplanements at Santa Fe Municipal Airport generally declined until the "Great Recession" when the airport lost all service for 18 months. While other airports continued to struggle, SAF had two airlines considering regional jet service to the airport, and in 2009, the return of jet service became a reality.

This fluctuating activity makes it very difficult to utilize trend line, correlation, and regression analyses because of the wide variety of complex factors involved. In addition, such a complex formula would still be at the ultimate mercy of the forecast of the multitude of independent variables that would be involved. **Table 2C** examines the last 20 years of the airport's enplanements as a percentage of the domestic enplanements in the United States (market share), as well as the ratio of enplanements to population (travel propensity factor) in the Santa Fe metropolitan statistical area (MSA).

### Market Share of Domestic Enplanements

Over the last 20 years, Santa Fe's market share has fluctuated from 0 percent in 2008 to a high 0.0112 percent in 2014. Before the introduction of regional jets in 2009, the airport's peak market share was 0.065 percent in 2000. **Table 2C** includes a constant market share projection that would maintain the 2014 share through 2035. Based upon the FAA's 2014 forecast for domestic enplanements, this would see enplanement levels grow to 82,800 in 2020 and 106,000 in 2035, for an annual average growth rate of 1.70 percent.

### Travel Propensity Factor

There are a variety of local factors that affect the potential for passengers within an area. A key statistic is the relationship between an airport's enplanement levels to the populace it serves. This ratio of enplanements to population is often termed the Travel Propensity Factor (TPF). **Table 2C** presents a review of the TPF for the Santa Fe MSA over the last 20 years.

***This ratio of enplanements to population is often termed the Travel Propensity Factor (TPF).***

**TABLE 2C**
**Market Share and Travel Propensity Projections**
**Santa Fe Municipal Airport**

| Year | SAF Enplaned | U.S. Domestic Enplanements (millions) | SAF Market Share | Santa Fe MSA Population | Travel Propensity Factor |
|---|---|---|---|---|---|
| 1995 | 12,126 | 531.1 | 0.0023% | 118,462 | 0.102 |
| 1996 | 17,341 | 558.1 | 0.0031% | 121,031 | 0.143 |
| 1997 | 20,868 | 578.3 | 0.0036% | 124,172 | 0.168 |
| 1998 | 22,139 | 589.3 | 0.0038% | 125,956 | 0.176 |
| 1999 | 26,823 | 611.2 | 0.0044% | 127,966 | 0.210 |
| 2000 | 43,687 | 641.2 | 0.0068% | 129,713 | 0.337 |
| 2001 | 40,808 | 625.3 | 0.0065% | 131,057 | 0.311 |
| 2002 | 18,153 | 574.6 | 0.0032% | 133,555 | 0.136 |
| 2003 | 17,528 | 587.3 | 0.0030% | 135,213 | 0.130 |
| 2004 | 19,199 | 628.5 | 0.0031% | 136,391 | 0.141 |
| 2005 | 10,386 | 669.5 | 0.0016% | 137,610 | 0.075 |
| 2006 | 9,432 | 668.4 | 0.0014% | 138,786 | 0.068 |
| 2007 | 10,902 | 688.5 | 0.0016% | 140,210 | 0.078 |
| 2008 | - | 680.7 | 0.0000% | 141,704 | - |
| 2009 | 9,534 | 630.8 | 0.0015% | 143,205 | 0.067 |
| 2010 | 43,589 | 634.8 | 0.0069% | 144,508 | 0.302 |
| 2011 | 43,302 | 650.1 | 0.0067% | 145,447 | 0.298 |
| 2012 | 47,709 | 653.8 | 0.0073% | 146,385 | 0.326 |
| 2013 | 64,468 | 654.4 | 0.0099% | 147,306 | 0.438 |
| 2014 | 74,551 | 668.4 | 0.0112% | 148,164 | 0.503 |
| **Constant Market Share (U.S. Domestic Enplanements)** | | | | | |
| 2020 | 82,760 | 742.0 | 0.0112% | 164,006 | 0.505 |
| 2025 | 88,850 | 796.6 | 0.0112% | 171,905 | 0.517 |
| 2035 | 106,071 | 951.0 | 0.0112% | 182,410 | 0.581 |
| **Travel Propensity Factor (UNM BBER Population Forecast)** | | | | | |
| 2020 | 82,495 | 742.0 | 0.0111% | 164,006 | 0.503 |
| 2025 | 86,468 | 796.6 | 0.0109% | 171,905 | 0.503 |
| 2035 | 91,752 | 951.0 | 0.0096% | 182,410 | 0.503 |
| **FAA TAF** | | | | | |
| 2020 | 79,269 | 742.0 | 0.0107% | 164,006 | 0.483 |
| 2025 | 87,090 | 796.6 | 0.0109% | 171,905 | 0.507 |
| 2035 | 105,122 | 951.0 | 0.0111% | 182,410 | 0.576 |
| **MASTER PLAN FORECAST** | | | | | |
| 2020 | 85,000 | 742.0 | 0.0115% | 164,006 | 0.518 |
| 2025 | 95,000 | 796.6 | 0.0119% | 171,905 | 0.553 |
| 2035 | 120,000 | 951.0 | 0.0126% | 182,410 | 0.658 |

The TPF is generally impacted by the proximity of an airport to other airports in the region with higher levels of service or "hub" airports. Regional airports with higher TPFs tend to be located farther from hub airports and in relatively isolated areas. These airports tend to have a service area that extends into adjacent, well-populated regions, or have some type of air service advantage that attracts more passengers that might otherwise choose to drive to a more distant hub airport for commercial service needs.

As with market share, the TPF reached a peak in 2000 of 0.337 that was not attained again for over a decade. With the introduction of regional jet service, the TPF has been on the rise since 2009, reaching a new high of 0.503 in 2014. An enplanement projection maintaining this same level of TPF relative to the University of New Mexico (UNM) population forecasts for the Santa Fe MSA is also presented on **Table 2C.** The projection has an annual average growth rate of 0.99 percent that would result in 82,495 enplanements in 2020 and 91,752 in 2035.

***Terminal Area Forecast***

The FAA annually publishes an updated set of activity forecasts for each airport in the national system. The *Terminal Area Forecast* (TAF) is used as a starting point for reasonableness of the master plan and other airport planning forecasts. **Table 2C** presents the 2014 TAF for enplanements. The TAF is slightly less optimistic than the constant market share, forecasting 79,300 enplanements in 2020 and 105,100 in 2035, for an annual average growth rate of 1.65 percent.

**Market Comparisons**

The market share and travel propensity analyses indicate that the two factors have been steadily growing in the Santa Fe market with the change in air service to regional jets and additional destinations. Essentially, this upgraded service has allowed Santa Fe Municipal Airport to capture additional portions of its own market share. The previous master plan approved in 2002 had noted that, in 2000, approximately seven percent of the passengers that enplaned at Albuquerque International Sunport originated from the Santa Fe area. From this, it was determined that Santa Fe Municipal Airport was capturing 18 percent of its own market. Based upon the change in domestic market share and the travel propensity factor, the airport probably captured 27 to 30 percent of the Santa Fe market in 2014.

***Essentially, this upgraded service has allowed Santa Fe Municipal Airport to capture additional portions of its own market share.***

Also mentioned in the previous master plan, due to the large difference in the level of service (LOS) between the airports in Albuquerque and Santa Fe, the Sunport will continue to draw market share from Santa Fe. **Exhibit 2F** depicts the location of nine markets in the western United States with similarities to the Santa Fe market. **Table 2D** further compares the markets in relation to enplanements, population, economics, and distance from a larger airport hub:

- All currently have jet service.
- Three of the other airports are in state capitals (Lincoln, NE; Bismarck, ND; and Helena; MT).
- Three have metropolitan area populations within 10 percent of Santa Fe's (St. George, UT; Grand Junction, CO; and Flagstaff, AZ).
- Two are within 100 miles of the closest medium or large hub airport (Lincoln and College Station, TX).


| Airport<br>Market<br>State | LNK<br>Lincoln*<br>NE | CLL<br>College Station.<br>TX | SGU<br>St. George<br>UT | SAF<br>Santa Fe*<br>NM | GJT<br>Grand Jct<br>CO | FLG<br>Flagstaff<br>AZ | BIS<br>Bismarck*<br>ND | MHT<br>Manhattan<br>KS | HLN<br>Helena*<br>MT |
|---|---|---|---|---|---|---|---|---|---|
| ***Travel Propensity Factor*** | | | | | | | | | |
| 2014 | 0.45 | 0.38 | 0.39 | 0.50 | 1.46 | 0.50 | 1.96 | 0.67 | 1.25 |
| 2010 | 0.47 | 0.32 | 0.28 | 0.30 | 1.50 | 0.46 | 1.71 | 0.71 | 1.31 |
| 2000 | 0.99 | 0.49 | 0.47 | 0.34 | 1.14 | 0.27 | 1.35 | 0.19 | 2.18 |
| ***Highway Distance to Closest Medium Hub Airport*** | | | | | | | | | |
| Miles | 62 | 93 | 140 | 67 | 269 | 148 | 442 | 128 | 488 |
| Hub | OMA | HOU | LAS | ABQ | DEN | PHX | MSP | MCI | SLC |

*State Capitals



Exhibit 2F
COMPARABLE MARKETS

- Three are 100 to 150 miles from the closest medium and large hub (St. George; Flagstaff; and Manhattan, KS).
- Three are more than 250 miles from a medium or large hub (Grand Junction; Bismarck; and Helena).

The table presents the population for each market for 2000, 2010, and 2014, as well as the enplanements at each in-market commercial service airport. The subsequent TPF as calculated for each year is also presented at the bottom of the table. In addition, the per capita personal income (PCPI) and the real per capita gross regional product (GRP) for 2013 are shown for each metropolitan area.

**TABLE 2D**
**Market Comparisons**
**Santa Fe Municipal Airport**

| Airport<br>Market<br>State | LNK<br>Lincoln*<br>NE | CLL<br>College Station.<br>TX | SGU<br>St. George<br>UT | SAF<br>Santa Fe*<br>NM | GJT<br>Grand Jct<br>CO | FLG<br>Flagstaff<br>AZ | BIS<br>Bismarck*<br>ND | MHT<br>Manhattan<br>KS | HLN<br>Helena*<br>MT |
|---|---|---|---|---|---|---|---|---|---|
| **MSA Population** | | | | | | | | | |
| 2014 | 318,945 | 236,819 | 151,948 | **148,164** | 147,083 | 136,539 | 126,597 | 98,191 | 77,414 |
| 2010 | 302,157 | 228,660 | 138,115 | **144,508** | 146,723 | 134,421 | 114,778 | 62,719 | 74,801 |
| 2000 | 266,787 | 184,885 | 90,354 | **127,966** | 116,255 | 116,320 | 100,828 | 81,052 | 65,765 |
| **Per Capita Household Income** | | | | | | | | | |
| 2013 | $42,743 | $33,484 | $29,928 | **$44,309** | $37,222 | $35,933 | $46,884 | $42,545 | $42,256 |
| **Real Per Capita Gross Regional Product (2009$)** | | | | | | | | | |
| 2013 | $49,285 | $32,398 | $26,776 | **$44,892** | $32,732 | $36,140 | $50,140 | $28,955 | N/A |
| **Highway Distance to Closest Medium Hub Airport** | | | | | | | | | |
| Miles | 62 | 93 | 140 | **67** | 269 | 148 | 442 | 128 | 488 |
| **Hub** | OMA | HOU | LAS | **ABQ** | DEN | PHX | MSP | MCI | SLC |
| **Annual Enplanements** | | | | | | | | | |
| 2014 | 142,205 | 91,127 | 59,572 | **74,572** | 214,313 | 68,123 | 248,316 | 65,649 | 96,869 |
| 2010 | 143,230 | 72,188 | 38,061 | **43,699** | 219,358 | 62,109 | 196,285 | 44,603 | 98,193 |
| 2000 | 262,919 | 90,736 | 42,733 | **43,687** | 132,930 | 31,603 | 136,611 | 15,490 | 143,632 |
| **Travel Propensity Factor** | | | | | | | | | |
| 2014 | 0.45 | 0.38 | 0.39 | **0.50** | 1.46 | 0.50 | 1.96 | 0.67 | 1.25 |
| 2010 | 0.47 | 0.32 | 0.28 | **0.30** | 1.50 | 0.46 | 1.71 | 0.71 | 1.31 |
| 2000 | 0.99 | 0.49 | 0.47 | **0.34** | 1.14 | 0.27 | 1.35 | 0.19 | 2.18 |

* State Capital

Sources: U.S. Bureau of Economic Analysis(BEA) website; U.S. Department of Transportation (USDOT) TransStats website.

The highest TPFs are associated with those markets that are farther than a three-hour drive from a more dominant market. These include the state capitals of Bismarck (1.96 TPF) and Helena (1.25 TPF). Bismarck's passengers have nearly doubled since 2000, due in large part to the North Dakota oil boom. Grand Junction has a 1.46 TPF, which is nearly three times that of Santa Fe, even though it has a population nearly identical to Santa Fe and a significantly lower PCPI and GRP.

Lincoln is the other state capital on the list. It is nearly the identical distance from Omaha that Santa Fe is from Albuquerque. Its population is over twice that of Santa Fe. While its PCPI is lower than Santa Fe's, its real per capita GRP is higher. In 2000, Lincoln's TPF was 0.99, but has since declined to be even lower than Santa Fe's at 0.45. While both are currently served by regional jets, Lincoln has seen a shift from larger commercial aircraft to smaller ones, as the airlines adjust their capacity discipline. So passengers once used to larger aircraft are deciding between using the smaller aircraft versus going to the larger airport hub.

College Station and St. George are the other two airports with lower TPFs than Santa Fe. Both have experienced a decline in the TPF since 2000, although they have each had strong population growth. The two metropolitan areas also have the lowest PCPI of the nine airports.

Like Santa Fe, both Flagstaff and Manhattan experienced upgrades to regional jet service at some point since the 2008 recession. Both have experienced somewhat similar growth in passenger levels to Santa Fe, and are within 2.5 hours of large or medium hub airports. Santa Fe has higher PCPI and real per capita GRP. Flagstaff had the same TPF as Santa Fe (0.50) in 2014, while Manhattan's was slightly higher at 0.67.

### Master Plan Forecast

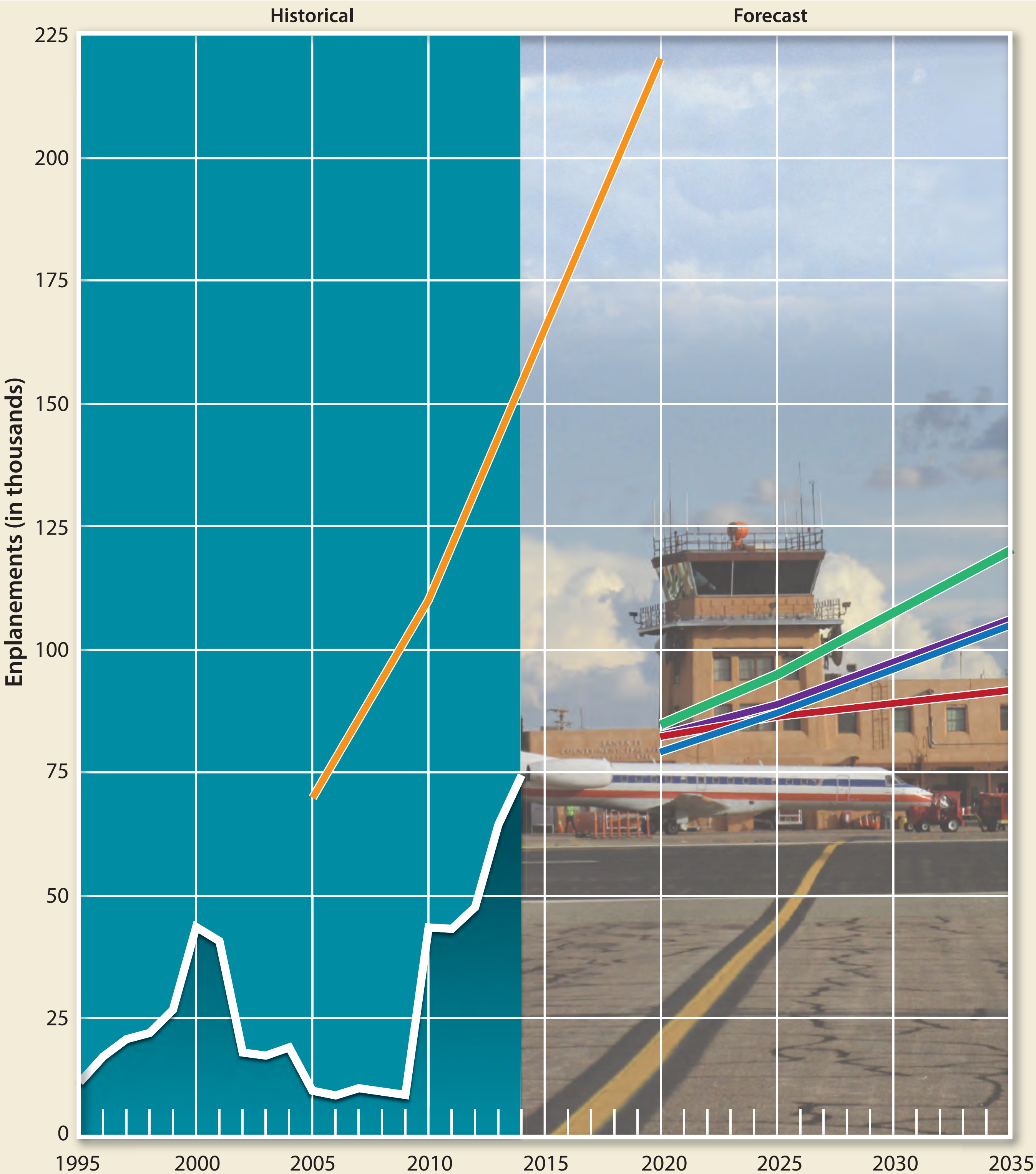
**Table 2C** and **Exhibit 2G** present the recommended forecast for master planning purposes. Based upon the analysis of comparative airports, an additional increase in market share capture still appears possible, although not as high as anticipated in the previous master plan. The forecast allows for an increase in the TPF and U.S. domestic enplanement market share to capture 35 to 40 percent of the Santa Fe market over the planning period. The other projections presented in the table and on the exhibit, however, provide a planning range of growth that should be considered going forward in the master plan.

## AIRLINE OPERATIONS FORECAST

The commercial service fleet mix defines a number of key parameters in airport planning, including critical aircraft (airfield design standards, pavement strength, and ramp geometry), terminal complex layout and aircraft performance capabilities (affecting runway length evaluations). A projection of the fleet mix for Santa Fe Municipal Airport has been prepared through a review of the equipment used by the airlines serving or anticipated to serve the airport.

Changes in equipment, airframes, and engines have always had a significant impact on airlines and airport planning. There are many ongoing programs by the manufacturers to improve performance characteristics. These programs continue to focus primarily on improvements in fuel efficiency. Regional jets also became a larger factor as the airlines looked for ways to "right-size" service into an airport for capacity discipline, as well controlling costs. Many airlines replaced larger commercial jets, as well as commuter turboprops on smaller emerging routes with regional jets.

Commuter airlines, such as the ones serving Santa Fe, are transitioning to advanced turboprop aircraft and regional jets to fit their market needs. Many of these aircraft have greater seating capacity, lower operating costs, and are considerably more comfortable for the flying public. The regional jets made their initial impact in the 44- to 50-seat range. Regional jet aircraft eventually became available with as




**LEGEND**

- Constant Market Share (U.S. Domestic Enplanements)
- Travel Propensity Factor (UNM BBER Population Forecast)
- FAA Terminal Area Forecast
- 2002 Master Plan Forecast
- ***2015 Master Plan Forecast***



**Exhibit 2G**
**ENPLANEMENT FORECAST**

few as 37 seats and as many as 100 seats. This bridged a long-existing gap in seating capacity, making regional jets the aircraft of choice to serve many non-hub airports, such as Santa Fe Municipal Airport.

As the price of fuel rose, however, the 50-seat and smaller regional jets have been found to be less cost-effective than their counterparts over 60 seats. In fact, the higher seat capacity turboprops, such as the Q400, have been more cost-effective than the 50-seat jet carrying the same number of passengers. As a result, the 50-seat regional jets are no longer in production, and can eventually be expected to be eliminated from the fleet through attrition. This will occur over time, however, as some regional carriers will maintain them for some services, as well as in agreements with major airlines that have scope clauses with pilot's unions that restrict code sharing on aircraft above a certain seating capacity.

In addition, the smaller seat turboprops that have been the workhorses for the small commuter markets are also no longer in production. In fact, the only commuter turboprops still in production are the ATR 42 in the 40- to 60-seat range and the Q-400 and ATR-72 above 60 seats. Unless there is a new aircraft manufactured in the range of 10 to 39 seats, smaller markets that can't support the larger turboprops could lose service from anything over nine-seats.

The retirement of the 10- to 60-seat fleet is being hastened by the Commuter Safety Initiative where Congress placed 10- to 30-seat aircraft under the same standards as the larger aircraft. This requires pilots to have 1,500 hours for an ATP rating and imposes additional rest time for the pilots. Not only has this created a shortage of qualified pilots, but also the need for more pilots for commuter airlines to maintain the same schedule.

**Table 2E** compares the airline operational fleet mix by seat capacity for the last three years at SAF. The average seats per departure actually declined from 44.9 to 39.3 in 2013 as service by 19-seat aircraft grew. The turboprop aircraft were completely replaced by 44 and 50 seat regional jet in 2014 and the seats per departure increased to 48.8. While the influx of smaller turboprop aircraft increased frequency, it decreased the boarding load factor (BLF) at the airport from 72.5 percent to 61.7 percent. The BLF is defined as the ratio of passengers boarding aircraft compared to the seating capacity of the aircraft. The change to an all-regional jet schedule in 2014 reduced the number of flights but increased the enplanements per departure and, subsequently, the BLF to 78.9 percent.

Airlines generally are operating with 80 to 85 percent load factors today, compared to as low as 60 percent 20-plus years ago. Airports served exclusively by commuter airlines will tend to be on the lower end of that scale, but the airlines are very wary of flights with low profitability in their restructured business models.

***Because of the increase in seats per departure, the number of flights may see very little change over the planning period.***

At Santa Fe Municipal Airport, a load factor going forward of at least 80 percent should be expected. As regional jets under 60 seats are removed from the fleet, SAF will see a transition to aircraft with over 60 seats. This could include the Bombardier CRJ700 and Q400, as well as the ERJ 170. Over the long term, as traffic grows, the aircraft could see a transition begin to include aircraft up to 90 seats (CRJ900 and

ERJ190) on the most popular flights. Table 2E presents this operations fleet mix forecast. Because of the increase in seats per departure, the number of flights may see very little change over the planning period.

**TABLE 2E**
**Airline Fleet Mix and Operations Forecast**
**Santa Fe Municipal Airport**

| Fleet Mix Seating Capacity | Actual | | | Forecast | | |
|---|---|---|---|---|---|---|
| | 2012 | 2013 | 2014 | 2020 | 2025 | 2035 |
| 75-90 | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 15.0% |
| 60-74 | 0.0% | 0.0% | 0.0% | 25.0% | 75.0% | 85.0% |
| 50-59 | 47.2% | 50.1% | 80.1% | 55.0% | 25.0% | 0.0% |
| 40-49 | 45.0% | 19.3% | 19.9% | 20.0% | 0.0% | 0.0% |
| 20-39 | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| 10-19 | 7.8% | 30.7% | 0.0% | 0.0% | 0.0% | 0.0% |
| <10 | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Total | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |
| Average Seats per Departures | 44.9 | 39.3 | 48.8 | 53.3 | 62.0 | 71.0 |
| Boarding Load Factor | 72.5% | 61.7% | 78.9% | 80.0% | 80.0% | 80.0% |
| Enplanements per Departure | 32.5 | 24.3 | 38.5 | 42.6 | 49.6 | 56.8 |
| Annual Enplanements | 47,709 | 64,468 | 74,551 | 85,000 | 95,000 | 120,000 |
| Annual Departures | 1,467 | 2,655 | 1,935 | 1,990 | 1,920 | 2,110 |
| Annual Operations | 2,934 | 5,310 | 3,870 | 3,980 | 3,840 | 4,220 |

## *GENERAL AVIATION FORECASTS*

General aviation encompasses all portions of civil aviation except commercial service and military operations. To determine the types and sizes of facilities that should be planned to accommodate general aviation activity at Santa Fe Municipal Airport, certain elements of this activity must be forecast. These indicators of general aviation demand include based aircraft, aircraft fleet mix, and annual operations.

### BASED AIRCRAFT FORECAST

The number of based aircraft is the most basic indicator of general aviation demand. By first developing a forecast of based aircraft for Santa Fe Municipal Airport, other general aviation activities and demand can be projected. The process of developing forecasts of based aircraft begins with an analysis of aircraft ownership in the primary general aviation service area through a review of historical aircraft registrations.

#### Service Area Aircraft Ownership

Analysis presented earlier indicates that Santa Fe County is the primary service area for general aviation demand.

***Aircraft ownership trends for the primary service area typically dictate the based aircraft trends for an airport.***

Aircraft ownership trends for the primary service area typically dictate the based aircraft trends for an airport. As such, analysis of Santa Fe County aircraft registrations was made.

**Table 2F** presents the history of registered aircraft in Santa Fe County from 1994 through 2014 (excluding balloons, gliders, ultralights, etc.). These figures are derived from the FAA aircraft registration database that categorized registered aircraft by county based on the zip code of the registered aircraft. Although this information generally provides a correlation to based aircraft, it is not uncommon for some aircraft to be registered in the county, but based at an airport outside the county.

**TABLE 2F**
**Historical Aircraft Registrations by Type**
**Santa Fe County**

| Year | SEP | MEP | Jet | Turboprop | Helicopter | Total |
|---|---|---|---|---|---|---|
| 1994 | 140 | 17 | 6 | 7 | 3 | **173** |
| 1995 | 145 | 15 | 8 | 6 | 3 | **177** |
| 1996 | 145 | 20 | 9 | 10 | 3 | **187** |
| 1997 | 157 | 22 | 11 | 7 | 3 | **200** |
| 1998 | 165 | 21 | 12 | 12 | 3 | **213** |
| 1999 | 173 | 20 | 12 | 11 | 4 | **220** |
| 2000 | 185 | 21 | 13 | 10 | 4 | **233** |
| 2001 | 190 | 18 | 21 | 14 | 4 | **247** |
| 2002 | 192 | 18 | 20 | 14 | 4 | **248** |
| 2003 | 194 | 19 | 23 | 22 | 7 | **265** |
| 2004 | 198 | 21 | 27 | 20 | 6 | **272** |
| 2005 | 197 | 22 | 25 | 19 | 7 | **270** |
| 2006 | 209 | 29 | 18 | 9 | 10 | **275** |
| 2007 | 222 | 28 | 17 | 13 | 7 | **287** |
| 2008 | 225 | 28 | 28 | 12 | 4 | **297** |
| 2009 | 231 | 29 | 24 | 14 | 7 | **305** |
| 2010 | 225 | 26 | 18 | 11 | 11 | **291** |
| 2011 | 234 | 25 | 17 | 10 | 11 | **297** |
| 2012 | 219 | 21 | 16 | 14 | 11 | **281** |
| 2013 | 219 | 18 | 15 | 16 | 5 | **273** |
| 2014 | 229 | 20 | 15 | 12 | 5 | **281** |

SEP - Single Engine Piston
MEP - Multi-Engine Piston
Source: FAA Aircraft Registration Database

As presented in the table, Santa Fe County registered aircraft between 1994 and 2014 ranged between a low of 173 in 1994 to a high of 305 in 2009. The table also includes the types of aircraft registered in Santa Fe County. As is typical for nearly all areas, single engine piston aircraft dominate the total aircraft numbers. In 2014, for example, there were 281 aircraft registered in the county, of which 229 were single engine piston aircraft. Aircraft registrations in 2014 also included 20 multi-engine piston aircraft, 15 jets, 12 turboprops, and five helicopters.

Registered aircraft projections are presented in **Table 2G**. These projections evaluate the potential growth of aircraft demand (registered aircraft) in Santa Fe County over the next 20 years.

**TABLE 2G**
**Registered Aircraft Projections**
**Santa Fe County**

| Year | County Registrations[1] | U.S. Active Aircraft[2] | Market Share of U.S. Aircraft | Santa Fe County Population[3] | Aircraft per 1,000 Residents |
|---|---|---|---|---|---|
| 2000 | 233 | 217,533 | 0.1071% | 129,713 | 1.7963 |
| 2001 | 247 | 211,446 | 0.1168% | 131,057 | 1.8847 |
| 2002 | 248 | 211,244 | 0.1174% | 133,555 | 1.8569 |
| 2003 | 265 | 209,606 | 0.1264% | 135,213 | 1.9599 |
| 2004 | 272 | 219,319 | 0.1240% | 136,391 | 1.9943 |
| 2005 | 270 | 224,257 | 0.1204% | 137,610 | 1.9621 |
| 2006 | 275 | 221,942 | 0.1239% | 138,786 | 1.9815 |
| 2007 | 287 | 231,606 | 0.1239% | 140,210 | 2.0469 |
| 2008 | 297 | 228,664 | 0.1299% | 141,704 | 2.0959 |
| 2009 | 305 | 223,876 | 0.1362% | 143,205 | 2.1298 |
| 2010 | 291 | 223,370 | 0.1303% | 144,508 | 2.0137 |
| 2011 | 297 | 220,453 | 0.1347% | 145,319 | 2.0438 |
| 2012 | 281 | 209,034 | 0.1344% | 146,375 | 1.9197 |
| 2013 | 273 | 199,927 | 0.1365% | 148,164 | 1.8426 |
| 2014 | 281 | 198,880 | 0.1413% | 150,061 | 1.8726 |
| **Constant Market Share of U.S. Active Aircraft Projections (AAGR - 0.36%)** | | | | | |
| 2020 | 282 | 199,410 | 0.1413% | 164,006 | 1.7179 |
| 2025 | 285 | 201,970 | 0.1413% | 171,905 | 1.6600 |
| 2035 | 303 | 214,260 | 0.1413% | 182,410 | 1.6596 |
| **Increasing Market Share Projection of U.S. Active Aircraft (AAGR - 1.01%)** | | | | | |
| 2020 | 289 | 199,410 | 0.1450% | 164,006 | 1.7630 |
| 2025 | 311 | 201,970 | 0.1540% | 171,905 | 1.8093 |
| 2035 | 347 | 214,260 | 0.1620% | 182,410 | 1.9029 |
| **Constant Ratio Projection per 1,000 County Residents (AAGR - (0.93%)** | | | | | |
| 2020 | 307 | 199,410 | 0.1540% | 164,006 | 1.8726 |
| 2025 | 322 | 201,970 | 0.1594% | 171,905 | 1.8726 |
| 2035 | 342 | 214,260 | 0.1594% | 182,410 | 1.8726 |
| **Historical Average Ratio Projection per 1,000 County Residents (AAGR - 1.15%)** | | | | | |
| 2020 | 321 | 199,410 | 0.1612% | 164,006 | 1.9600 |
| 2025 | 337 | 201,970 | 0.1668% | 171,905 | 1.9600 |
| 2035 | 358 | 214,260 | 0.1669% | 182,410 | 1.9600 |
| ***Selected Registered Aircraft Forecast (AAGR - 0.98%)*** | | | | | |
| 2020 | 295 | 199,410 | 0.1479% | 164,006 | 1.7987 |
| 2025 | 315 | 201,970 | 0.1560% | 171,905 | 1.8324 |
| 2035 | 345 | 214,260 | 0.1610% | 182,410 | 1.8913 |

Source:
[1]FAA Aircraft Registration Database
[2]*FAA Aerospace Forecasts - Fiscal Years 2015-2035*
[3]U.S. Census Bureau; University of New Mexico Bureau of Business and Economic Research
Coffman Associates analysis

The number of registered aircraft in Santa Fe County generally increased from 2000 through 2009. Since this time, the overall number of registered aircraft has been on the decline, with minor increases and decreases experienced each year. As a result, various regression and time-series analyses did not result in a reliable forecast. Therefore, several market share forecasts have been developed.

***The number of registered aircraft in Santa Fe County generally increased from 2000 through 2009. Since this time, the overall number of registered aircraft has been on the decline, with minor increases and decreases experienced each year.***

The first two forecasts consider the relationship between historical registered aircraft in the county and the active U.S. general aviation fleet as forecast by the FAA. The first projection considers the county maintaining its 2014 percentage (0.1413 percent) as a constant into the forecast years. This results in a long term projection of 303 registered aircraft and an annual growth rate of 0.36 percent. A second market share forecast considers increasing market share through the long term planning period. As evidenced since 2000, the county has gained market share of the U.S. active fleet over the past several years, increasing from 0.1071 percent in 2000 to a high of 0.1413 percent in 2014. This forecast projects 347 registered aircraft in Santa Fe County by 2035, resulting in a 1.01 percent AAGR.

Two additional forecasts have been developed that consider the relationship between historical registered aircraft and the population. By maintaining the same ratio of aircraft per 1,000 people, a long term forecast emerges. In 2014, Santa Fe County registered aircraft represented 1.8726 aircraft per 1,000 people. Projecting this ratio through the long term planning period yields 342 registered aircraft by 2035 and an AAGR of 0.93 percent. The second forecast considers the historical average ratio of registered aircraft per 1,000 people, which is slightly higher at 1.9600. In this case, 358 registered aircraft are projected in Santa Fe County by 2035, which is an annual growth rate of 1.15 percent.

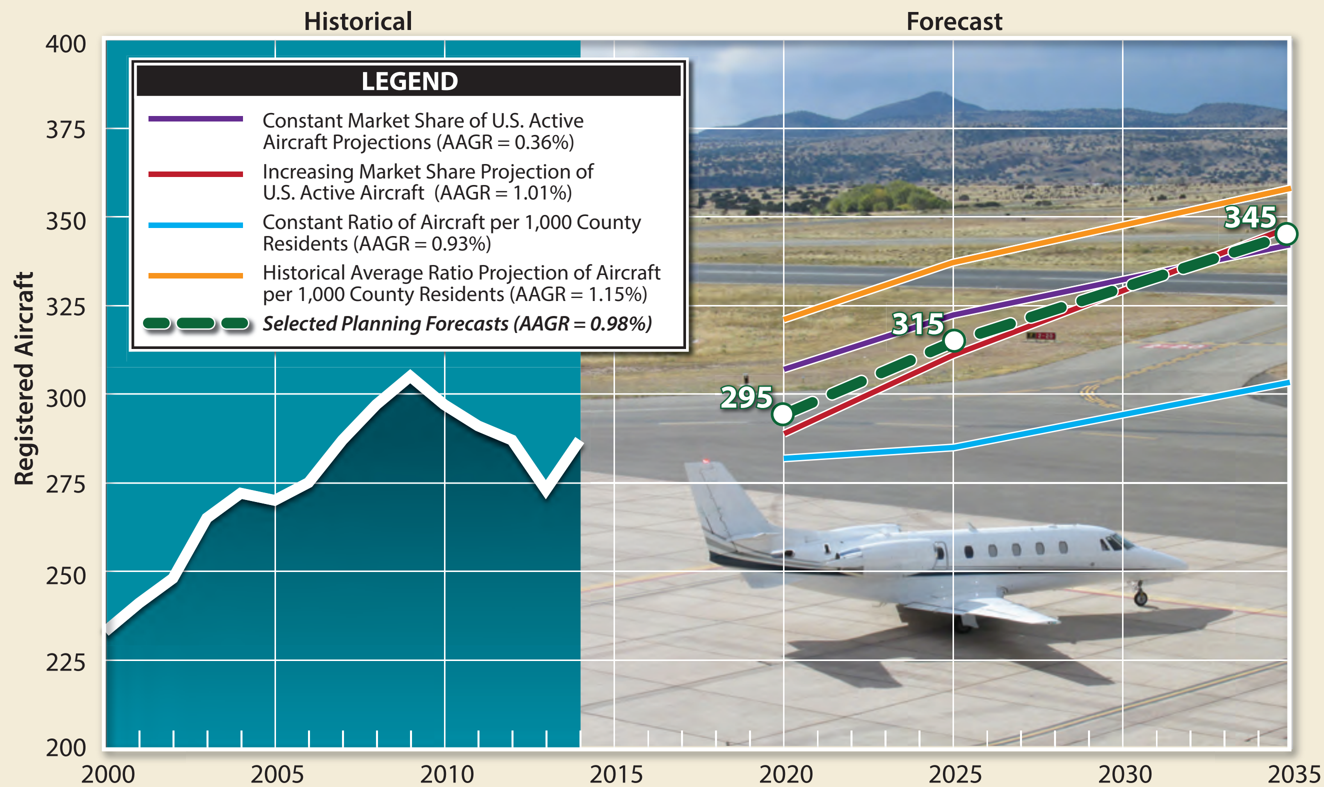
**Exhibit 2H** summarizes the registered aircraft forecasts for Santa Fe County, which present a reasonable planning envelope. The constant market share projection tends to be conservative based upon the increasing market shares of registered aircraft achieved by the county over the past several years. This projection serves as the low end of the planning envelope. The historical ratio projection per 1,000 county residents serves as the high boundary. The selected forecast falls between the increasing market share projection of U.S. active aircraft and constant ratio projection per 1,000 county residents and considers that Santa Fe County registered aircraft will continue to gain market share and hold a steady ratio per 1,000 residents through the long term planning period. This results in a number of registered aircraft increasing from 281 to 345 in 20 years, equating to a 0.98 percent AAGR. The selected forecast tempers growth in the near term, due to current economic stagnation, and then exhibits higher levels of growth in the intermediate and long terms. This registered aircraft projection will be a major element considered in the based aircraft forecast to follow.

**Based Aircraft Forecasts**

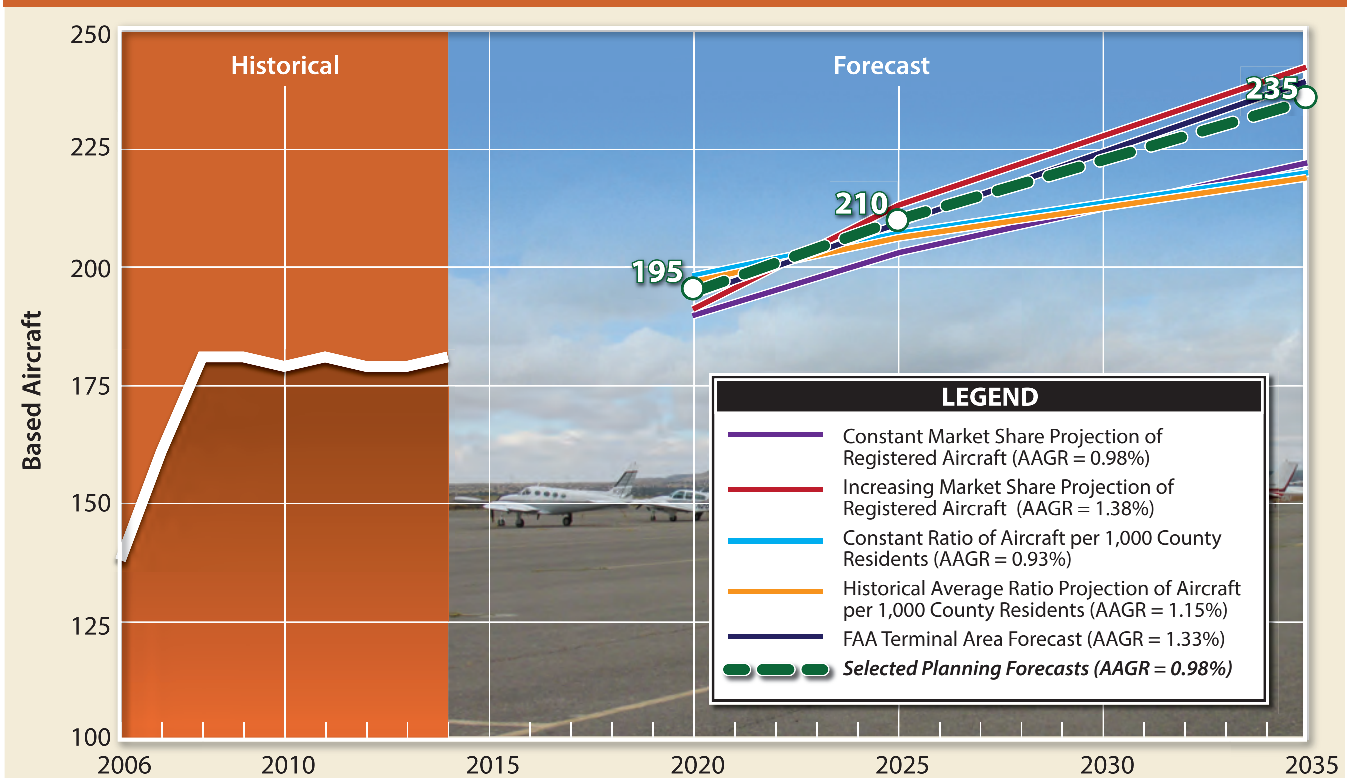
Determining the number of based aircraft at an airport can be a challenging task because of the transient nature of based aircraft due to the availability and cost of aircraft storage. In 2014, there were a total of 181 aircraft based at the airport according to records obtained from the FAA TAF. Historical based aircraft data was also obtained from the FAA TAF.

**Table 2H** includes several forecasts for based aircraft at Santa Fe Municipal Airport. The first method used to project based aircraft examined the airport's share of registered aircraft in Santa Fe County. As

## REGISTERED AIRCRAFT - SANTA FE COUNTY




## BASED AIRCRAFT - SANTA FE MUNICIPAL AIRPORT




- County Aircraft Registrations from FAA Aircraft Registration Database
- Based Aircraft source from FAA Terminal Area Forecast (January 2015)

AAGR: Average Annual Growth Rate



**Exhibit 2H: REGISTERED & BASED AIRCRAFT FORECAST**

shown, the airport captured 64.41 percent of aircraft registered in the county in 2014. Previous years averaged between approximately 50 percent and 66 percent of registered aircraft in the county. The first forecast assumes a constant market share of 64.41 percent. This yields 222 aircraft by 2035, equating to a 0.98 percent AAGR. The second projection assumes the airport's market share will increase throughout the planning period, similar to what has occurred over the past several years. This projection would yield 242 based aircraft by the year 2035, resulting in a growth rate of 1.38 percent annually.

Trends comparing the number of based aircraft with the Santa Fe County population were also analyzed. A constant ratio of based aircraft per 1,000 people results in based aircraft growing at the same rate as the county population. This yields 220 based aircraft by 2035, which is an annual growth rate of 0.93 percent. A historical ratio of based aircraft per 1,000 residents projection was also analyzed and yields a slightly lower forecast when compared to the constant ratio projection. This results in 219 based aircraft by 2035, resulting in a 0.91 percent AAGR.

Existing forecasts for Santa Fe Municipal Airport were also reviewed to include projections from the FAA TAF published in January 2015 and the *New Mexico Airport System Plan Update 2009* (NMASP). The 2015 TAF is the FAA's most current forecast of activity for the airport and included 181 based aircraft in 2014. The TAF calls for a 1.33 percent annual growth rate which yields 239 based aircraft by 2035. Although not included in the table, the NMASP utilized a base year of 2007 and identified 179 based aircraft at Santa Fe Municipal Airport. Extrapolating the study, based aircraft projections yield 234 aircraft by 2035. This equates to a 1.00 percent annual growth rate.

The forecasts previously discussed represent a reasonable planning envelope. The bottom of **Table 2H** includes the based aircraft forecast for Santa Fe Municipal Airport. The forecasts are further depicted on **Exhibit 2H**. The selected forecast is closest to the FAA TAF. In the next five years, 195 aircraft are projected. In 10 years, 210 aircraft are projected and by 2035, 235 based aircraft are projected. This forecast results in a 1.25 percent AAGR through the long term planning period.

***This forecast results in a 1.25 percent AAGR through the long term planning period.***

Future aircraft basing at the airport will depend on several factors, including the state of the economy, fuel costs, available facilities, competing airports, and adjacent development potential. Forecasts assume a reasonably stable and growing economy, as well as reasonable development of airport facilities necessary to accommodate aviation demand. Competing airports will play a role in deciding demand; however, Santa Fe Municipal Airport should fare well in this competition as it is served by a runway capable of handling the majority of general aviation aircraft and the airport's capability of being expanded to meet future demand.

**TABLE 2H**
**Based Aircraft Forecasts**
**Santa Fe Municipal Airport**

| Year | Santa Fe Airport Based Aircraft[1] | Santa Fe County Registered Aircraft[2] | Market Share of Registered Aircraft | Santa Fe County Population[3] | Aircraft per 1,000 Residents |
|---|---|---|---|---|---|
| 2006 | 138 | 275 | 50.18% | 138,786 | 0.9943 |
| 2007 | 161 | 287 | 56.10% | 140,210 | 1.1483 |
| 2008 | 181 | 297 | 60.94% | 141,704 | 1.2773 |
| 2009 | 181 | 305 | 59.34% | 143,205 | 1.2639 |
| 2010 | 179 | 291 | 61.51% | 144,508 | 1.2387 |
| 2011 | 181 | 297 | 60.94% | 145,319 | 1.2455 |
| 2012 | 179 | 281 | 63.70% | 146,375 | 1.2229 |
| 2013 | 179 | 273 | 65.57% | 148,164 | 1.2081 |
| 2014 | 181 | 281 | 64.41% | 150,061 | 1.2062 |
| **Constant Market Share Projection of Registered Aircraft (AAGR - 0.98%)** | | | | | |
| 2020 | 190 | 295 | 64.41% | 164,006 | 1.1586 |
| 2025 | 203 | 315 | 64.41% | 171,905 | 1.1803 |
| 2035 | 222 | 345 | 64.41% | 182,410 | 1.2182 |
| **Increasing Market Share Projection of Registered Aircraft (AAGR - 1.38%)** | | | | | |
| 2020 | 191 | 295 | 64.90% | 164,006 | 1.1674 |
| 2025 | 213 | 315 | 67.50% | 171,905 | 1.2369 |
| 2035 | 242 | 345 | 70.00% | 182,410 | 1.3239 |
| **Constant Ratio Projection per 1,000 County Residents (AAGR - 0.93%)** | | | | | |
| 2020 | 198 | 295 | 67.06% | 164,006 | 1.2062 |
| 2025 | 207 | 315 | 65.83% | 171,905 | 1.2062 |
| 2035 | 220 | 345 | 63.77% | 182,410 | 1.2062 |
| **Historical Average Ratio Projection per 1,000 County Residents (AAGR - 0.91%)** | | | | | |
| 2020 | 197 | 295 | 66.75% | 164,006 | 1.2006 |
| 2025 | 206 | 315 | 65.52% | 171,905 | 1.2006 |
| 2035 | 219 | 345 | 63.48% | 182,410 | 1.2006 |
| **FAA *Terminal Area Forecast* Growth Rate (AAGR - 1.33%)** | | | | | |
| 2020 | 194 | 295 | 65.76% | 164,006 | 1.1829 |
| 2025 | 209 | 315 | 66.35% | 171,905 | 1.2158 |
| 2035 | 239 | 345 | 69.28% | 182,410 | 1.3102 |
| ***Selected Based Aircraft Forecast (AAGR - 1.25%)*** | | | | | |
| 2020 | 195 | 295 | 66.10% | 164,006 | 1.1890 |
| 2025 | 210 | 315 | 66.67% | 171,905 | 1.2216 |
| 2035 | 235 | 345 | 68.12% | 182,410 | 1.2883 |

Source:
[1]FAA *Terminal Area Forecast* (January 2015)
[2]FAA Aircraft Registration Database
[3]U.S. Census Bureau; University of New Mexico Bureau of Business and Economic Research
Coffman Associates analysis

## BASED AIRCRAFT FLEET MIX

The fleet mix of the based aircraft is oftentimes more important to airport planning and design than the total number of aircraft. For example, the presence of one or a few large business jets can impact design standards more than a large number of smaller single engine piston-powered aircraft.

***The airport is well-positioned to accommodate business jets in the future; however, smaller single engine piston-powered aircraft will continue to dominate the overall fleet mix.***

The based aircraft fleet mix at Santa Fe Municipal Airport, as presented in **Table 2J**, was compared to the existing and forecast U.S. general aviation fleet mix trends as presented in *FAA Aerospace Forecasts – Fiscal Years 2015-2035*. The FAA expects business jets will continue to be the fastest growing general aviation aircraft type in the future. The airport is well-positioned to accommodate business jets in the future; however, smaller single engine piston-powered aircraft will continue to dominate the overall fleet mix.

**TABLE 2J**
**Based Aircraft Fleet Mix**
**Santa Fe Municipal Airport**

| | EXISTING | | FORECAST | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Aircraft Type** | **2014** | **%** | **2020** | **%** | **2025** | **%** | **2035** | **%** |
| Single Engine | 129 | 71.27% | 136 | 69.74% | 141 | 67.14% | 153 | 65.11% |
| Multi-Engine | 22 | 12.15% | 22 | 11.28% | 23 | 10.95% | 24 | 10.21% |
| Jet | 20 | 11.05% | 23 | 11.79% | 27 | 12.86% | 31 | 13.19% |
| Turboprop | 6 | 3.31% | 8 | 4.10% | 11 | 5.24% | 15 | 6.38% |
| Helicopter | 4 | 2.21% | 6 | 3.08% | 8 | 3.81% | 12 | 5.11% |
| **Totals** | **181** | **100.00%** | **195** | **100.00%** | **210** | **100.00%** | **235** | **100.00%** |

Source: FAA *Terminal Area Forecast*; FAA Form 5010-1; Coffman Associates analysis

According to FAA records, there are currently 20 jets based at the airport which are forecast to increase to 31 by 2035. Turboprops are forecast to increase from six currently to 15 by 2035. Helicopters based at the airport are forecast to grow from four currently to 12 by the long term. Single and multi-engine piston aircraft are forecast to increase over the 20-year forecast period, but at a slower rate when compared to jets, turboprops, and helicopters.

## GENERAL AVIATION OPERATIONS

General aviation operations are classified by the airport traffic control tower (ATCT) as either local or itinerant. A local operation is a takeoff or landing performed by an aircraft that operates within sight of the airport, or which executes simulated approaches or touch-and-go operations at the airport. Itinerant operations are those performed by aircraft with a specific origin or destination away from the airport.

Generally, local operations are characterized by training operations. Typically, itinerant operations increase with business and commercial use, since business aircraft are operated on a higher frequency. A breakdown of general aviation operations, as well as overall operations at Santa Fe Municipal Airport, was detailed in Chapter One.

**Itinerant Operations**

**Table 2K** depicts general aviation itinerant operations at Santa Fe Municipal Airport from 2000 through 2014. General aviation itinerant operations at the airport have experienced a declining trend since the most recent national recession in 2008. National general aviation itinerant operations have been declining since at least 2000, but have taken a steeper decline since the beginning of the recession and have yet to recover; however, the FAA forecasts a reversal by 2015. From 2014 through 2035, the FAA forecasts an annual growth rate of 0.4 percent for itinerant general aviation operations in the United States.

Prior to 2008, the airport averaged approximately 33,000 annual itinerant general aviation operations. From 2008 to 2014, itinerant general aviation operations have decreased to approximately 25,000 annually.

Five forecasts are considered to develop the planning envelope for future itinerant general aviation operations. The planning envelope is intended as the range where the forecast may reasonably fall. The first two forecasts consider future itinerant general aviation operations in comparison to the airport's market share of national itinerant general aviation operations as forecast by the FAA. The first of these two considers the airport maintaining a constant market share (0.1604 percent) of national itinerant general aviation operations, which yields 24,250 operations by 2035. The next considers the airport beginning to regain market share with a modestly increasing share of national itinerant general aviation operations. By the long term, the increasing market share forecast results in 26,835 operations. The constant and increasing market share projections result in AAGRs of 0.37 percent and 0.86 percent, respectively.

The next two projections consider the relationship between based aircraft and itinerant general aviation operations. In 2014, there were 124 itinerant general aviation operations per based aircraft. When maintaining this ratio, a forecast results in 29,140 itinerant general aviation operations by 2035. This represents an annual growth rate of 1.26 percent. The second forecast considers an increasing number of itinerant general aviation operations per based aircraft. By 2035, itinerant general aviation operations reach 35,250, which correspond to 150 operations per based aircraft and an annual growth rate of 2.18 percent.

The 2015 FAA TAF also presents an itinerant general aviation operation forecast, which is included in the table. The TAF forecasts a minimal growth rate of 0.28 percent annually. This results in a 2035 itinerant general aviation operations projection of 23,762.

**TABLE 2K**
**General Aviation Itinerant Operations Forecast**
**Santa Fe Municipal Airport**

| Year | Santa Fe Itinerant GA Operations[1] | U.S. ATCT Itinerant GA Operations[2] | Market Share of Itinerant Operations | Santa Fe Based Aircraft[3] | Itinerant Operations per Based Aircraft |
|---|---|---|---|---|---|
| 2000 | 34,681 | 22,844,100 | 0.1518% | | |
| 2001 | 31,336 | 21,432,900 | 0.1462% | | |
| 2002 | 34,774 | 21,450,500 | 0.1621% | | |
| 2003 | 33,354 | 20,231,300 | 0.1649% | | |
| 2004 | 33,077 | 20,007,200 | 0.1653% | | |
| 2005 | 31,866 | 19,303,200 | 0.1651% | | |
| 2006 | 32,138 | 18,707,100 | 0.1718% | 138 | 233 |
| 2007 | 31,634 | 18,575,200 | 0.1703% | 161 | 196 |
| 2008 | 27,908 | 17,492,700 | 0.1595% | 181 | 154 |
| 2009 | 26,060 | 15,571,100 | 0.1674% | 181 | 144 |
| 2010 | 25,910 | 14,863,900 | 0.1743% | 179 | 145 |
| 2011 | 24,476 | 14,527,900 | 0.1685% | 181 | 135 |
| 2012 | 22,943 | 14,521,700 | 0.1580% | 179 | 128 |
| 2013 | 23,184 | 14,177,400 | 0.1635% | 179 | 130 |
| 2014 | 22,419 | 13,977,500 | 0.1604% | 181 | 124 |
| **Constant Market Share Projection (AAGR - 0.37%)** | | | | | |
| 2020 | 22,792 | 14,209,500 | 0.1604% | 195 | 117 |
| 2025 | 23,257 | 14,499,400 | 0.1604% | 210 | 111 |
| 2035 | 24,250 | 15,118,400 | 0.1604% | 235 | 103 |
| **Increasing Market Share Projection (AAGR - 0.86%)** | | | | | |
| 2020 | 23,204 | 14,209,500 | 0.1633% | 195 | 119 |
| 2025 | 24,649 | 14,499,400 | 0.1700% | 210 | 117 |
| 2035 | 26,835 | 15,118,400 | 0.1775% | 235 | 114 |
| **Constant Operations per Based Aircraft (AAGR - 1.26%)** | | | | | |
| 2020 | 24,180 | 14,209,500 | 0.1702% | 195 | 124 |
| 2025 | 26,040 | 14,499,400 | 0.1796% | 210 | 124 |
| 2035 | 29,140 | 15,118,400 | 0.1927% | 235 | 124 |
| **Increasing Operations per Based Aircraft (AAGR - 2.18%)** | | | | | |
| 2020 | 24,960 | 14,209,500 | 0.1757% | 195 | 128 |
| 2025 | 28,350 | 14,499,400 | 0.1955% | 210 | 135 |
| 2035 | 35,250 | 15,118,400 | 0.2332% | 235 | 150 |
| **FAA *Terminal Area Forecast* Growth Rate (AAGR - 0.28%)** | | | | | |
| 2020 | 22,164 | 14,209,500 | 0.1560% | 195 | 114 |
| 2025 | 22,686 | 14,499,400 | 0.1565% | 210 | 108 |
| 2035 | 23,762 | 15,118,400 | 0.1572% | 235 | 101 |
| ***Selected Planning Forecast (AAGR - 1.06%)*** | | | | | |
| 2020 | 23,500 | 14,209,500 | 0.1654% | 195 | 121 |
| 2025 | 25,000 | 14,499,400 | 0.1724% | 210 | 119 |
| 2035 | 28,000 | 15,118,400 | 0.1852% | 235 | 119 |

Source:
[1]Historical data from ATCT as reported to FAA
[2]*FAA Aerospace Forecasts - Fiscal Years 2015-2035*
[3]FAA *Terminal Area Forecast* (January 2015)
Coffman Associates analysis

*The selected forecast equates to a 1.06 percent annual growth rate.*

The selected planning forecast is a rounded average of the five forecasts. In the next five years, itinerant general aviation operations are forecast to reach 23,500. In 10 years, 25,000 itinerant general aviation operations are forecast and by 2035, 28,000 itinerant general aviation operations are projected. The selected forecast equates to a 1.06 percent annual growth rate, which is higher than the projected growth rate for national itinerant general aviation operations. **Exhibit 2J** presents the itinerant general aviation operations forecast.

**Local Operations**

A similar methodology was utilized to forecast local general aviation operations. **Table 2L** depicts the history of local operations at Santa Fe Municipal Airport and examines its historic market share of general aviation local operations at towered airports in the United States. Historical local operations range from a recent experienced low of 30,047 in 2014 to a high of 42,283 in 2002.

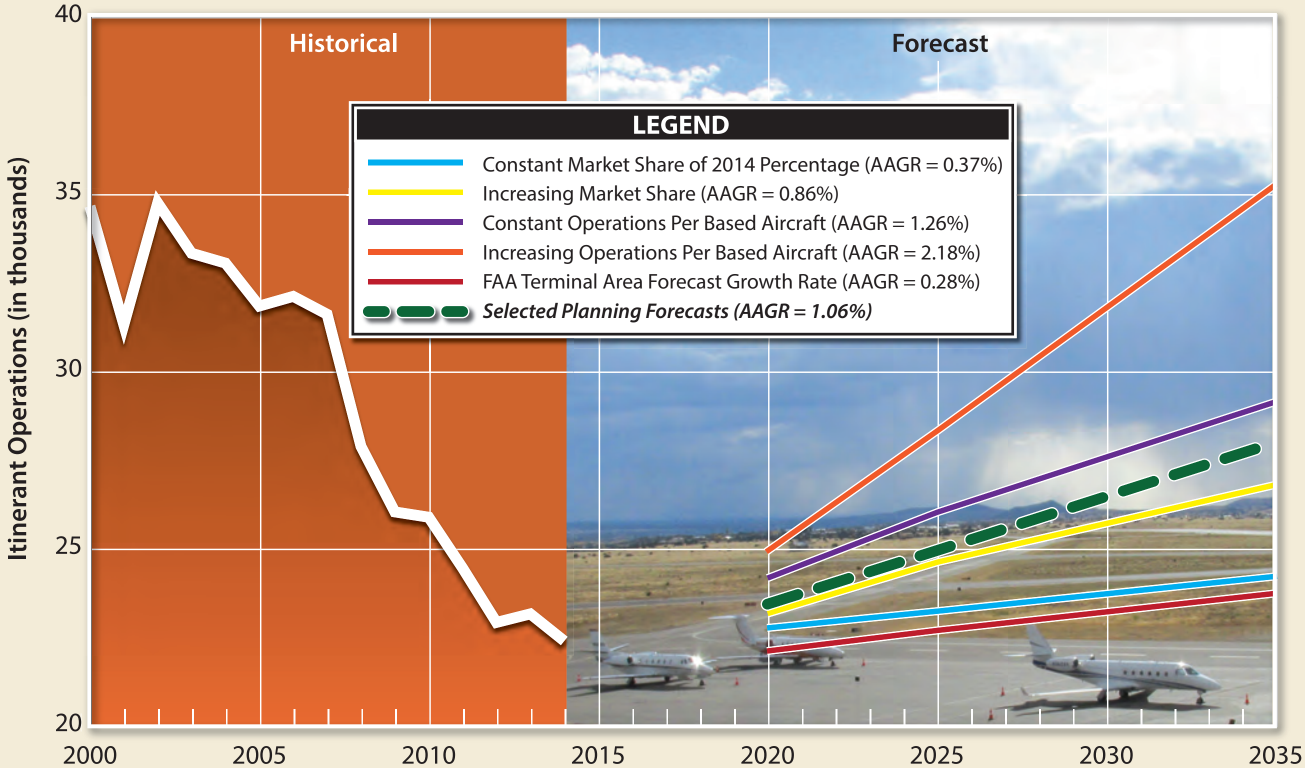
As with national itinerant operations, local operations have been declining for some time. The FAA TAF and the national projections estimate a modest annual growth rate going forward of approximately 0.5 percent. Five forecasts are considered when analyzing local general aviation operations at Santa Fe Municipal Airport.

The first two forecasts of local general aviation operations consider the airport's market share of national local general aviation operations as counted by the FAA. The first maintains the airport's 2014 market share at 0.2574 percent, resulting in 33,586 local general aviation operations by 2035. This forecast results in an annual growth rate of 0.53 percent. The second forecast applies an increasing market share of national local general aviation operations that approaches levels the airport has experienced in the recent past. This forecast results in 36,535 local general aviation operations by 2035 and an annual growth rate of 0.94 percent.

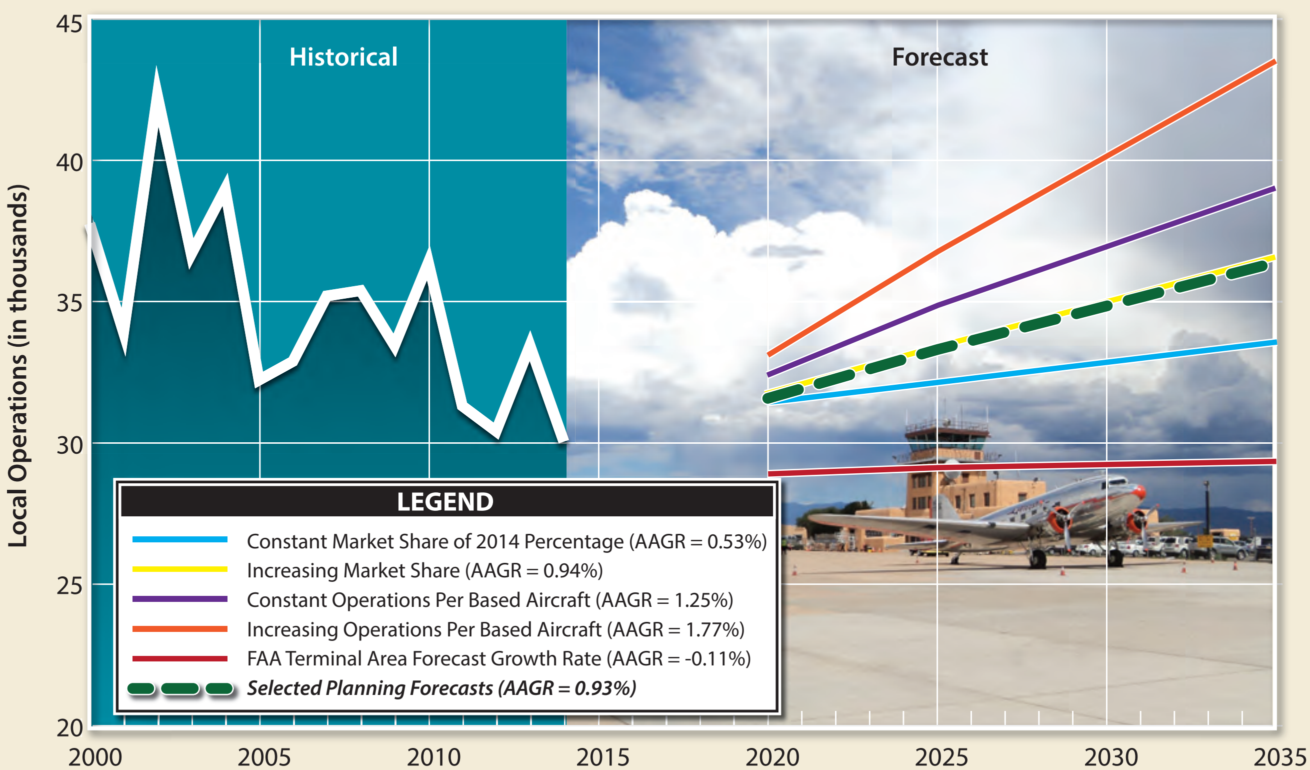
The next two projections consider the relationship between based aircraft and local general aviation operations. In 2014, there were 166 local general aviation operations per based aircraft. When maintaining this ratio, a forecast results in 39,010 itinerant general aviation operations by 2035. This represents an annual growth rate of 1.25 percent. The second forecast considers an increasing number of local general aviation operations per based aircraft, which yields 43,475 operations by 2035. This represents a strong 1.77 percent AAGR.

The 2015 FAA TAF projection is also presented in the table. The TAF identifies a 2035 projection of 29,365 local general aviation operations. When compared to the actual number of local general aviation operations experienced at the airport in 2014, this represents a decline (negative growth) in operations through the planning period. It should be noted that the TAF estimate for 2014 local general aviation operations was 28,930, which was below the actual figure documented by the ATCT.

## GENERAL AVIATION ITINERANT OPERATIONS




## GENERAL AVIATION LOCAL OPERATIONS




Historical Data from ATCT as reported by FAA
AAGR: Average Annual Growth Rate



Exhibit 2J: LOCAL & ITINERANT GA OPERATIONS FORECAST

**TABLE 2L**
**General Aviation Local Operations Forecast**
**Santa Fe Municipal Airport**

| Year | Santa Fe Local GA Operations[1] | U.S. ATCT Local GA Operations[2] | Market Share of Local Operations | Santa Fe Based Aircraft[3] | Local Operations per Based Aircraft |
|---|---|---|---|---|---|
| 2000 | 37,764 | 17,034,400 | 0.2217% | | |
| 2001 | 33,914 | 16,193,600 | 0.2094% | | |
| 2002 | 42,283 | 16,172,800 | 0.2614% | | |
| 2003 | 36,683 | 15,292,700 | 0.2399% | | |
| 2004 | 38,973 | 14,960,400 | 0.2605% | | |
| 2005 | 32,226 | 14,843,600 | 0.2171% | | |
| 2006 | 32,886 | 14,365,400 | 0.2289% | 138 | 238 |
| 2007 | 35,202 | 14,556,800 | 0.2418% | 161 | 219 |
| 2008 | 35,390 | 14,081,200 | 0.2513% | 181 | 196 |
| 2009 | 33,449 | 12,448,000 | 0.2687% | 181 | 185 |
| 2010 | 36,379 | 11,716,300 | 0.3105% | 179 | 203 |
| 2011 | 31,313 | 11,437,000 | 0.2738% | 181 | 173 |
| 2012 | 30,418 | 11,608,300 | 0.2620% | 179 | 170 |
| 2013 | 33,443 | 11,748,300 | 0.2847% | 179 | 187 |
| 2014 | 30,047 | 11,674,100 | 0.2574% | 181 | 166 |
| **Constant Market Share Projection (AAGR - 0.53%)** | | | | | |
| 2020 | 31,421 | 12,207,100 | 0.2574% | 195 | 161 |
| 2025 | 32,110 | 12,474,700 | 0.2574% | 210 | 153 |
| 2035 | 33,586 | 13,048,100 | 0.2574% | 235 | 143 |
| **Increasing Market Share Projection (AAGR - 0.94%)** | | | | | |
| 2020 | 31,738 | 12,207,100 | 0.2600% | 195 | 163 |
| 2025 | 33,370 | 12,474,700 | 0.2675% | 210 | 159 |
| 2035 | 36,535 | 13,048,100 | 0.2800% | 235 | 155 |
| **Constant Operations per Based Aircraft (AAGR - 1.25%)** | | | | | |
| 2020 | 32,370 | 12,207,100 | 0.2652% | 195 | 166 |
| 2025 | 34,860 | 12,474,700 | 0.2794% | 210 | 166 |
| 2035 | 39,010 | 13,048,100 | 0.2990% | 235 | 166 |
| **Increasing Operations per Based Aircraft (AAGR - 1.77%)** | | | | | |
| 2020 | 33,150 | 12,207,100 | 0.2716% | 195 | 170 |
| 2025 | 36,750 | 12,474,700 | 0.2946% | 210 | 175 |
| 2035 | 43,475 | 13,048,100 | 0.3332% | 235 | 185 |
| **FAA *Terminal Area Forecast* Growth Rate (AAGR - -0.11%)** | | | | | |
| 2020 | 28,930 | 12,207,100 | 0.2370% | 195 | 148 |
| 2025 | 29,075 | 12,474,700 | 0.2331% | 210 | 138 |
| 2035 | 29,365 | 13,048,100 | 0.2251% | 235 | 125 |
| ***Selected Planning Forecast (AAGR - 0.93%)*** | | | | | |
| 2020 | 31,600 | 12,207,100 | 0.2589% | 195 | 162 |
| 2025 | 33,300 | 12,474,700 | 0.2669% | 210 | 159 |
| 2035 | 36,500 | 13,048,100 | 0.2797% | 235 | 155 |

Source:
[1]Historical data from ATCT as reported to FAA
[2]*FAA Aerospace Forecasts - Fiscal Years 2015-2035*
[3]FAA *Terminal Area Forecast* (January 2015)
Coffman Associates analysis

**Exhibit 2J** presents the local general aviation operations forecast. The selected forecast falls within the planning envelope of the five forecasts presented in the table. The selected planning forecast for local general aviation operations considers 31,600 by 2020; 33,300 by 2025; and 36,500 by 2035. The AAGR is 0.93 percent.

## *OTHER AIR TAXI AND MILITARY*

Air taxi operations as reported by the ATCT include operations conducted for-hire with fewer than 60 passenger seats and/or less than 18,000 pounds of payload. Some operations by aircraft operated under fractional ownership programs are also counted as air taxi operations. Since the airline operations have been forecast earlier in this chapter, this section reviews the growth potential for the "other" air taxi operations at Santa Fe Municipal Airport.

According to ATCT records, there were 7,997 air taxi operations at Santa Fe Municipal Airport in 2014. Of this total, 3,870 operations were conducted by scheduled commercial airlines service as previously discussed, leaving approximately 4,127 operations being included in the "other" air taxi activity. Over the past 10 years, the airport has averaged approximately 4,300 "other" air taxi operations annually. According to the current *FAA Aerospace Forecasts – Fiscal Years 2015-2035*, air taxi operations are projected to remain steady over the next 20 years. The resulting forecast for Santa Fe Municipal Airport is presented in **Table 2M**.

**TABLE 2M**
**Other Air Taxi Operations**
**Santa Fe Municipal Airport**

| Year | Other Air Taxi Operations |
|---|---|
| 2014 | 4,127 |
| **Forecast (AAGR = 1.35%)** | |
| 2020 | 4,400 |
| 2025 | 4,800 |
| 2035 | 5,500 |

Military operations are an important factor in air traffic activity at Santa Fe Municipal Airport because of the presence of the New Mexico Army National Guard. As previously discussed in Chapter One, the New Mexico Army National Guard primarily operates UH-60 Blackhawk helicopters associated with training exercises and search and rescue missions in the area.

***The New Mexico Army National Guard primarily operates UH-60 Blackhawk helicopters associated with training exercises and search and rescue missions in the area.***

In 2014, there were 5,922 military operations at the airport. Since 2000, the airport has experienced an average of 5,000 annual military operations. Developing a reliable forecast of military activity is inherently difficult, primarily because the military mission can change rapidly. Generally during peace time, civilian airports will experience higher levels of military operations. When there are overseas commitments, many of those pilots and equipment will be out of the country. The FAA recognizes these challenges to forecasting military activity and, therefore, provides only a flat forecast for both local and itinerant military activity.

**Table 2N** presents the history of military activity at the airport. The forecast presented considers a zero growth scenario of 5,900 annual military operations. These operations are then categorized as either local or itinerant based on historical trends.

**TABLE 2N**
**Military Operations Forecast**
**Santa Fe Municipal Airport**

| Year | Military Itinerant Operations | Military Local Operations | Total[1] |
|---|---|---|---|
| 2000 | 1,775 | 1,776 | 3,551 |
| 2001 | 1,914 | 1,850 | 3,764 |
| 2002 | 2,064 | 1,972 | 4,036 |
| 2003 | 1,771 | 1,836 | 3,607 |
| 2004 | 1,776 | 1,914 | 3,690 |
| 2005 | 2,053 | 2,338 | 4,391 |
| 2006 | 2,348 | 2,760 | 5,108 |
| 2007 | 2,710 | 3,041 | 5,751 |
| 2008 | 2,778 | 3,006 | 5,784 |
| 2009 | 2,584 | 3,611 | 6,195 |
| 2010 | 2,758 | 4,150 | 6,908 |
| 2011 | 1,903 | 2,640 | 4,543 |
| 2012 | 2,129 | 2,827 | 4,956 |
| 2013 | 2,318 | 3,326 | 5,644 |
| 2014 | 2,451 | 3,471 | 5,922 |
| **Military Operations Forecast** | | | |
| 2020 | 2,400 | 3,500 | 5,900 |
| 2025 | 2,400 | 3,500 | 5,900 |
| 2035 | 2,400 | 3,500 | 5,900 |

Source:
[1]Historical data from ATCT as reported to FAA
Coffman Associates analysis

## *AIR CARGO*

Due to the airport's proximity to Albuquerque International Sunport, it is not anticipated to be served by major cargo carriers in the future. Typically, air cargo in the Santa Fe region is transported by ground to Albuquerque and handled by designated air cargo carriers. Although limited, air cargo can occasionally be transported aboard scheduled commuter airline flights from Santa Fe Municipal Airport.

Future cargo traffic is not anticipated to be significant; therefore, the development of a major air cargo facility at the airport is not being pursued. In the event that air cargo operations at the airport materialize in the future, anticipated facility development could include additional office space for personnel and apron space for aircraft parking and vehicle staging.

## *TOTAL OPERATIONS ADJUSTMENT AND FORECAST*

The Santa Fe Municipal Airport ATCT is not a 24-hour tower, and as such, its air traffic counts are not all-inclusive of aircraft operations at the airport. Some aspects of the Master Plan require that all airport activity be considered. For these evaluations, it is necessary to estimate and adjust for operations that occur when the tower is closed. The Santa Fe Municipal Airport operates from 7:00 a.m. to 9:00 p.m. daily.

For planning purposes within this Master Plan, operations for after the tower has closed are estimated at three percent of total operations. This estimate is consistent with other facilities similar to Santa Fe Municipal Airport where after-hours operational counts have been conducted.

**Table 2P** presents a summary of the ATCT operations, as well as the adjusted operations, for all aircraft activity segments at Santa Fe Municipal Airport. The operational projections equate to a 0.90 percent AAGR. The selected total operations forecast for the airport to be utilized for this Airport Master Plan is as follows:

**Year 2020 – 71,300** **Year 2025 – 74,900** **Year 2035 – 82,400**

**TABLE 2P**
**Forecast Adjustment for ATCT After-Hours Operations**
**Santa Fe Municipal Airport**

| | Base Year 2014* | 2020 | 2025 | 2035 |
|---|---|---|---|---|
| **ATCT OPERATIONS** | | | | |
| Air Carrier | 3,870 | 3,980 | 3,840 | 4,220 |
| General Aviation | | | | |
| Itinerant | 22,419 | 23,500 | 25,000 | 28,000 |
| Local | 30,047 | 31,600 | 33,300 | 36,500 |
| Air Taxi | 4,127 | 4,400 | 4,800 | 5,500 |
| Military | | | | |
| Itinerant | 2,451 | 2,400 | 2,400 | 2,400 |
| Local | 3,471 | 3,500 | 3,500 | 3,500 |
| ***Total ATCT Operations*** | ***66,385*** | ***69,380*** | ***72,840*** | ***80,120*** |
| **ADJUSTED OPERATIONS**** | | | | |
| Air Carrier | 3,858 | 4,000 | 3,800 | 4,200 |
| General Aviation | | | | |
| Itinerant | 23,100 | 24,200 | 25,800 | 28,800 |
| Local | 30,900 | 32,500 | 34,300 | 37,600 |
| Air Taxi | 4,300 | 4,500 | 4,900 | 5,700 |
| Military | | | | |
| Itinerant | 2,500 | 2,500 | 2,500 | 2,500 |
| Local | 3,600 | 3,600 | 3,600 | 3,600 |
| ***Total Adjusted Operations*** | ***68,300*** | ***71,300*** | ***74,900*** | ***82,400*** |

*ATCT records for period from January through December 2014
**Adjusted operations rounded to the nearest 100
Adjustment accounts for the hours (9:00 p.m. - 7:00 a.m.) when the ATCT is closed

## *COMPARISON TO THE FAA TAF*

The FAA will review the forecasts presented in this master plan for comparison to the TAF. The local Airports District Office (ADO) of the FAA can approve the forecasts if they do not differ by more than 10 percent in the first five years and 15 percent for years 6-10. If the planning forecasts exceed these parameters, then the forecasts must be forwarded to FAA headquarters in Washington, D.C. for further review. Any deviation from these thresholds will require specific local documentation. **Table 2Q** presents the direct comparison of the Master Plan forecasts with the TAF published in January 2015.

**TABLE 2Q**
**Forecast Comparison to the 2015 FAA *Terminal Area Forecast***
**Santa Fe Municipal Airport**

| Year | Airport Activity | FAA TAF | Percent Difference |
|---|---|---|---|
| **PASSENGER ENPLANMENTS** | | | |
| 2014 | 74,551 | 70,805 | 5.29% |
| 2020 | 85,000 | 79,269 | 7.23% |
| 2025 | 95,000 | 87,090 | 9.08% |
| 2035 | 120,000 | 105,122 | 14.15% |
| AAGR | 2.29% | 1.90% | 0.39% |
| **BASED AIRCRAFT** | | | |
| 2014 | 181 | 181 | 0.00% |
| 2020 | 195 | 194 | 0.52% |
| 2025 | 210 | 209 | 0.48% |
| 2035 | 235 | 239 | -1.67% |
| AAGR | 1.25% | 1.33% | -0.08% |
| **ANNUAL OPERATIONS*** | | | |
| 2014 | 68,300 | 65,496 | 4.28% |
| 2020 | 71,300 | 65,211 | 9.34% |
| 2025 | 74,900 | 66,373 | 12.85% |
| 2035 | 82,400 | 68,812 | 19.75% |
| AAGR | 0.90% | 0.24% | 0.66% |

*ATCT records adjusted by three percent to account for after-hours activity
Source: FAA TAF (2015); Coffman Associates analysis

The reason the FAA allows this differential is because the TAF forecasts are not meant to replace forecasts developed locally (i.e., in this Master Plan). While the TAF can provide a point of reference or comparison, their purpose is much broader in defining FAA national workload measures.

The Master Plan forecast for passenger enplanements is within the 10 and 15 percent tolerances of the TAF for the five and 10-year timeframes as described above. For the five-year timeframe, the Master Plan projects passenger enplanement levels that are 7.23 percent higher than the TAF. For the 10-year timeframe, the difference increases to 9.08 percent. The long range (2035) forecast for the Master Plan is even more aggressive than the TAF. Overall, both forecasts call for reasonable growth in passenger enplanements through 2035. The Master Plan projects enplanements to increase at approximately 2.29 percent annually, while the TAF exhibits a 1.90 percent AAGR.

Regarding based aircraft, the Master Plan and TAF are very close. The forecast for the five-year timeframe is 0.52 percent higher than the TAF and the forecast for the 10-year timeframe is 0.48 percent higher than the TAF. During the long range, the Master Plan projection for based aircraft is slightly lower than what the TAF is projecting.

The total annual operations forecast in the Master Plan are 9.34 percent higher than the TAF in the five-year timeframe. The 10-year forecast is 12.85 percent higher than the TAF. The primary reason for this is that the TAF has a lower 2014 operations number than what was actually realized by the Santa Fe Municipal Airport ATCT. Furthermore, the Master Plan makes an adjustment for total annual operations based upon the ATCT being closed from 9:00 p.m. to 7:00 a.m. daily. During the planning period, the Master Plan also accounts for a slightly higher growth rate in annual operations versus the TAF forecast.

## *PEAKING CHARACTERISTICS*

Many airport facility needs are related to the levels of activity during peak periods. The periods used in developing facility requirements for this study are as follows:

- **Peak Month** – The calendar month when peak aircraft operations occur.

- **Design Day** – The average day in the peak month. This indicator is easily derived by dividing the peak month operations by the number of days in a month.

- **Busy Day** – The busy day of a typical week in the peak month.

- **Design Hour** – The peak hour within the design day.

It is important to note that only the peak month is an absolute peak within a given year. All other peak periods will be exceeded at various times during the year. However, they do represent reasonable planning standards that can be applied without overbuilding or being too restrictive.

### AIRLINE PEAKING

Peaking characteristics related to airline activity is important for planning and design of the passenger terminal building as well as associated facilities and services. The analysis is commonly used as a basis for determining the appropriate size of the terminal and the functional spaces therein.

Over the last several years, the peak month for enplanements has generally been July; yet in 2013, it was October and in 2014, it was August. The peak month over the last five years has ranged between 10.4 percent in 2014 to 12.8 percent in 2011. Although the average over the period has been 11.4 percent, the 2011 peak was out of character with the other four years, which together average right at 11 percent. Thus, 11 percent will be considered as the peak month for enplanements during the planning period.

***The design hour is based upon the flight schedule and 90 percent of the seats being filled during the design hour.***

The design day takes into account fluctuations in available flights during the week versus the weekend. Thus, the design day is factored slightly down from the 31 days to 30.5 days. The design hour is based upon the flight schedule and 90 percent of the seats being filled during the design hour. The operations projections follow a similar analysis and are presented in **Table 2R**.

**TABLE 2R**
**Peaking Characteristics**
**Santa Fe Municipal Airport**

| | 2014 | 2020 | 2025 | 2035 |
|---|---|---|---|---|
| **AIRLINE ENPLANEMENTS** | | | | |
| Annual Enplanements | 74,551 | 85,000 | 95,000 | 120,000 |
| Peak Month | 7,775 | 9,350 | 10,450 | 13,200 |
| Design Day | 255 | 307 | 343 | 426 |
| Design Hour | 89 | 106 | 116 | 136 |
| **AIRLINE OPERATIONS** | | | | |
| Annual Operations | 3,780 | 3,980 | 3,840 | 4,220 |
| Peak Month | 410 | 420 | 408 | 442 |
| Design Day | 14 | 14 | 14 | 16 |
| Design Hour | 4 | 4 | 4 | 4 |
| **GENERAL AVIATION, "OTHER" AIR TAXI, AND MILITARY OPERATIONS** | | | | |
| Annual Operations | 64,400 | 67,300 | 71,100 | 78,200 |
| Peak Month | 6,504 | 6,797 | 7,181 | 7,898 |
| Busy Day | 288 | 301 | 318 | 350 |
| Design Day | 217 | 227 | 239 | 263 |
| Design Hour | 33 | 34 | 36 | 39 |

Source: Coffman Associates analysis

### GENERAL AVIATION AND OTHER AIR TAXI PEAKING

The peak periods forecast for general aviation, "other" air taxi, and military have been determined utilizing operations reports by the Santa Fe Municipal Airport ATCT to the FAA. Since 2010, the peak month average has accounted for 10.1 percent of the annual operations. The design day operations were calculated by dividing the peak month by the number of days in a month (30).

Daily operational counts from the ATCT were utilized to determine a busy day peaking factor for general aviation activity. The peak day of each week has historically averaged 19 percent of weekly operations. Thus, to determine the typical busy day, the design day is multiplied by 1.33, which represents 19 percent of the days in a week (7 x 0.19). Design hour operations were determined to be approximately 15 percent of the design day operations. The peaking characteristics are summarized in **Table 2R** for general aviation, "other" air taxi, and military activity projected at the airport.

## *ANNUAL INSTRUMENT APPROACHES*

Forecasts of annual instrument approaches (AIAs) provide guidance in determining an airport's requirements for navigational aid facilities. An instrument approach as defined by the FAA is "an approach to an airport with intent to land by an aircraft in accordance with an instrument flight rules (IFR) flight plan, when visibility is less than three miles and/or when the ceiling is at or below the minimum initial approach altitude."

Historical data on instrument approaches to the airport is not readily available. Therefore, an estimate of AIAs was prepared based upon information from similar airports. The number of AIAs was calculated for the planning period by utilizing an industry standard of 2.5 percent of itinerant operations. The AIA projections are presented on **Exhibit 2K**.

## FORECAST SUMMARY

This chapter has outlined the various activity levels that might reasonably be anticipated over the planning period. **Exhibit 2K** is a summary of the aviation forecasts prepared in this chapter. Actual activity is included for 2014, which was the base year for these forecasts. The forecasting effort extends through the next 20 years to the year 2035. Forecasts for aviation activity, including enplanements, based aircraft, and operations, is key to determining future facility requirements.

## AIRCRAFT/AIRPORT/RUNWAY CLASSIFICATION

The FAA has established several aircraft classification systems that group aircraft types based on their performance (approach speed in landing configuration) and on design characteristics (wingspan and landing gear configuration). These classification systems are used to determine the appropriate airport design standards for specific airport elements, such as runways, taxiways, taxilanes, and aprons.

### AIRCRAFT CLASSIFICATION

***The design aircraft may be a single aircraft type or a composite aircraft representing a collection of aircraft.***

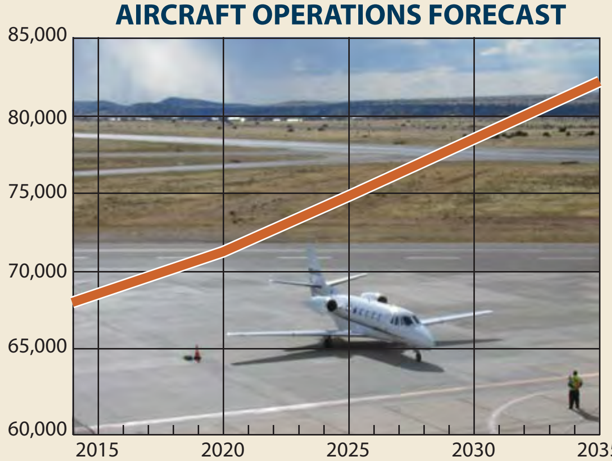
The selection of appropriate FAA design standards for the development and location of airport facilities is based primarily upon the characteristics of the aircraft which are currently using or are expected to use an airport. The critical design aircraft is used to define the design parameters for an airport. The design aircraft may be a single aircraft type or a composite aircraft representing a collection of aircraft. The design aircraft is classified by three parameters: Aircraft Approach Category (AAC), Airplane Design Group (ADG), and Taxiway Design Group (TDG). FAA AC 150/5300-13A, Change 1, *Airport Design*, describes the following airplane classification systems, the parameters of which are presented on **Exhibit 2L**.

***Aircraft Approach Category (AAC):*** A grouping of aircraft based on a reference landing speed ($V_{REF}$), if specified, or if $V_{REF}$ is not specified, 1.3 times stall speed ($V_{SO}$) at the maximum certificated landing weight. $V_{REF}$, $V_{SO}$, and the maximum certificated landing weight are those values as established for the aircraft by the certification authority of the country of registry.

| | Base Year | 2020 | 2025 | 2035 |
|---|---|---|---|---|
| ***BASED AIRCRAFT FLEET MIX*** | | | | |
| Single Engine | 129 | 136 | 141 | 153 |
| Multi-Engine | 22 | 22 | 23 | 24 |
| Jet | 20 | 23 | 27 | 31 |
| Turboprop | 6 | 8 | 11 | 15 |
| Helicopter | 4 | 6 | 8 | 12 |
| **Totals** | **181** | **195** | **210** | **235** |
| ***ADJUSTED OPERATIONS**** | | | | |
| **Air Carrier** | 3,858 | 4,000 | 3,800 | 4,200 |
| **General Aviation** | | | | |
| Itinerant | 23,100 | 24,200 | 25,800 | 28,800 |
| Local | 30,900 | 32,500 | 34,300 | 37,600 |
| **Air Taxi** | 4,300 | 4,500 | 4,900 | 5,700 |
| **Military** | | | | |
| Itinerant | 2,500 | 2,500 | 2,500 | 2,500 |
| Local | 3,600 | 3,600 | 3,600 | 3,600 |
| **Total Adjusted Operations** | **68,300** | **71,300** | **74,900** | **82,400** |
| ***PEAKING CHARACTERISTICS*** | | | | |
| ***AIRLINE ENPLANEMENTS*** | | | | |
| Annual Enplanements | 74,551 | 85,000 | 95,000 | 120,000 |
| Peak Month | 7,775 | 9,350 | 10,450 | 13,200 |
| Design Day | 255 | 307 | 343 | 426 |
| Design Hour | 89 | 106 | 116 | 136 |
| ***AIRLINE OPERATIONS*** | | | | |
| Annual Operations | 3,780 | 3,980 | 3,840 | 4,220 |
| Peak Month | 410 | 420 | 408 | 442 |
| Design Day | 14 | 14 | 14 | 16 |
| Design Hour | 4 | 4 | 4 | 4 |
| ***GENERAL AVIATION, "OTHER" AIR TAXI, AND MILITARY OPERATIONS*** | | | | |
| Annual Operations | 64,400 | 67,300 | 71,100 | 78,200 |
| Peak Month | 6,504 | 6,797 | 7,181 | 7,898 |
| Busy Day | 288 | 301 | 318 | 350 |
| Design Day | 217 | 227 | 239 | 263 |
| Design Hour | 33 | 34 | 36 | 39 |
| **ANNUAL INSTRUMENT APPROACHES** | **N/A** | **880** | **925** | **1,030** |
| ***ENPLANEMENTS*** | ***74,551*** | ***85,000*** | ***95,000*** | ***120,000*** |

*Adjusted operations rounded to the nearest 100. Adjustment accounts for the hours (9:00 p.m. - 7:00 a.m.) when the ATCT is closed.

**AIRCRAFT OPERATIONS FORECAST**




**BASED AIRCRAFT FORECAST**

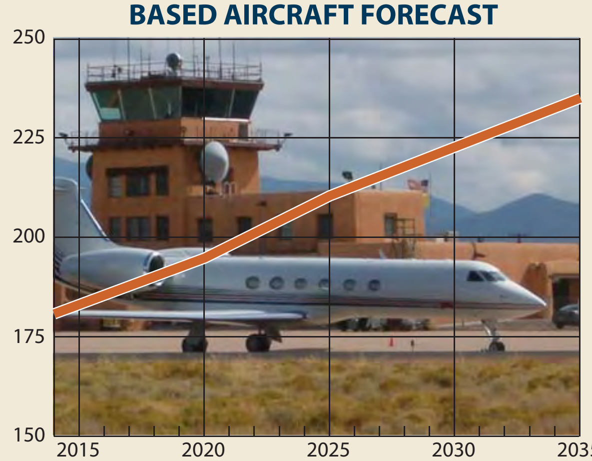




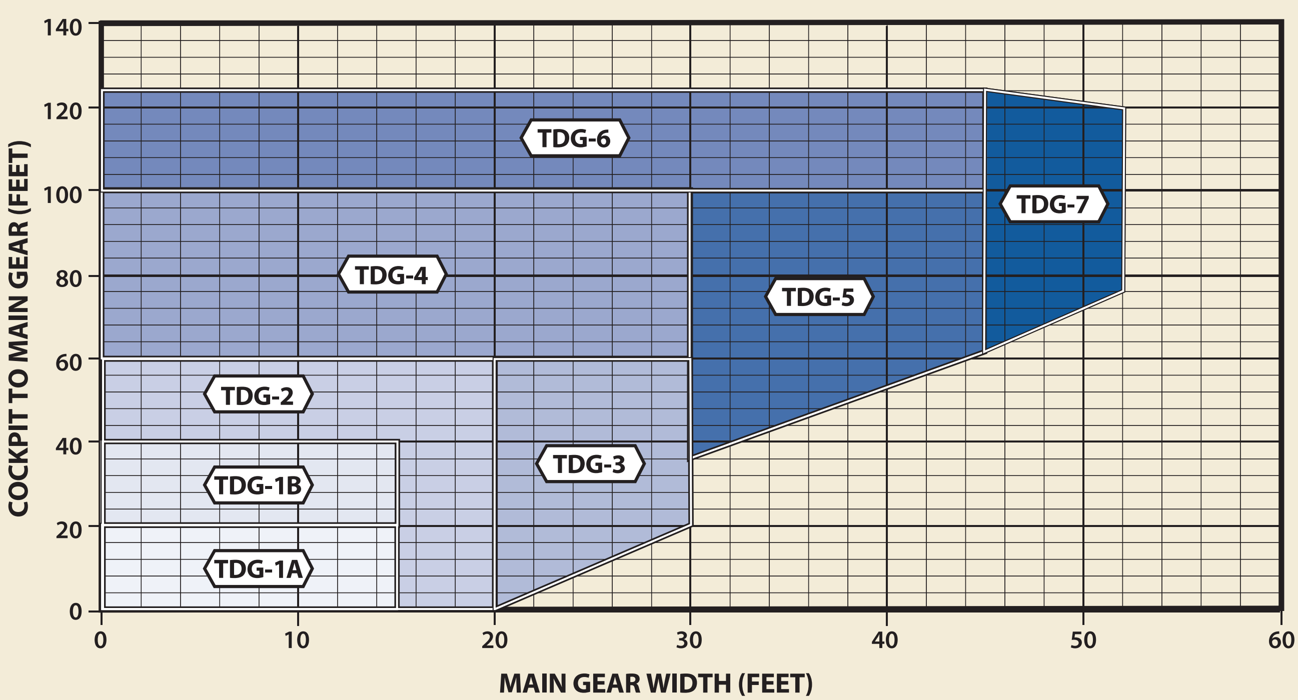

Exhibit 2K
FORECAST SUMMARY

| AIRCRAFT APPROACH CATEGORY (AAC) | |
|---|---|
| **Category** | **Approach Speed** |
| A | less than 91 knots |
| B | 91 knots or more but less than 121 knots |
| C | 121 knots or more but less than 141 knots |
| D | 141 knots or more but less than 166 knots |
| E | 166 knots or more |

| AIRPLANE DESIGN GROUP (ADG) | | |
|---|---|---|
| **Group #** | **Tail Height (ft)** | **Wingspan (ft)** |
| I | <20 | <49 |
| II | 20-<30 | 49-<79 |
| III | 30-<45 | 70-<118 |
| IV | 45-<60 | 118-<171 |
| V | 60-<66 | 171-<214 |
| VI | 66-<80 | 214-<262 |

| VISIBILITY MINIMUMS | |
|---|---|
| **RVR (ft)** | **Flight Visibility Category (statute miles)** |
| VIS | 3-mile or greater visibility minimums |
| 5,000 | Lower than 3 miles but not lower than 1-mile |
| 4,000 | Lower than 1-mile but not lower than ¾-mile (APV ≥ ¾ but < 1-mile) |
| 2,400 | Lower than ¾-mile but not lower than ½-mile (CAT-I PA) |
| 1,600 | Lower than ½-mile but not lower than ¼-mile (CAT-II PA) |
| 1,200 | Lower than ¼-mile (CAT-III PA) |

**TAXIWAY DESIGN GROUP (TDG)**




**KEY**

**APV**: Approach Procedure with Vertical Guidance
**PA**: Precision Approach
**RVR**: Runway Visual Range
**TDG**: Taxiway Design Group

***Source:*** FAA AC 150/5300-13A, Change 1, Airport Design



**Exhibit 2L: AIRCRAFT CLASSIFICATION PARAMETERS**

The AAC generally refers to the approach speed of an aircraft in landing configuration. The higher the approach speed, the more restrictive the applicable design standards. The AAC, depicted by a letter A through E, is the aircraft approach category and relates to aircraft approach speed (operational characteristic). The AAC generally applies to runways and runway-related facilities, such as runway width, runway safety area (RSA), runway object free area (ROFA), runway protection zone (RPZ), and separation standards.

***Airplane Design Group (ADG)***: The ADG, depicted by a Roman numeral I through VI, is a classification of aircraft which relates to aircraft wingspan or tail height (physical characteristic). When the aircraft wingspan and tail height fall in different groups, the higher group is used. The ADG influences design standards for taxiway safety area (TSA), taxiway object free (TOFA), taxilane object free area, apron wingtip clearance, and various separation distances.

***Taxiway Design Group (TDG)***: A classification of airplanes based on outer-to-outer Main Gear Width (MGW) and Cockpit to Main Gear (CMG) distance. The TDG relates to the undercarriage dimensions of the design aircraft. The taxiway design elements determined by the application of the TDG include the taxiway width, taxiway edge safety margin, taxiway shoulder width, taxiway fillet dimensions, and, in some cases, the separation distance between parallel taxiways/taxilanes. Other taxiway elements, such as the taxiway safety area (TSA), taxiway/taxilane object free area (TOFA), taxiway/taxilane separation to parallel taxiway/taxilanes or fixed or movable objects, and taxiway/taxilane wingtip clearances are determined solely based on the wingspan (ADG) of the design aircraft utilizing those surfaces. It is appropriate for taxiways to be planned and built to different TDG standards based on expected use.

**Exhibit 2M** summarizes the classification of the most common jet aircraft in operation today. Generally, most business jets will fall in approach categories B and C, while commercial aircraft will fall in C and D. Business jets typically have slower approach speeds as compared to commercial transport aircraft. Recreational and business piston and turboprop aircraft will generally fall in AACs A and B and ADGs I and II.

## AIRPORT AND RUNWAY CLASSIFICATION

These classifications, along with the aircraft classifications defined previously, are used to determine the appropriate FAA design standards to which the airfield facilities are to be designed and built.

***Airport Reference Code (ARC)*****:** An airport designation that signifies the airport's highest Runway Design Code (RDC), minus the third (visibility) component of the RDC. The ARC is used for planning and design only and does not limit the aircraft that may be able to operate safely on the airport. The current Airport Layout Plan (ALP) for Santa Fe Municipal Airport, which will be updated as part of this master planning effort, identifies an existing ARC of D-II currently and a future ARC of D-III.

***Runway Design Code (RDC):*** A code signifying the design standards to which the runway is to be built. The RDC is based upon planned development and has no operational component.

## A-I

- Beech Baron 55
- **Beech Bonanza**
- Cessna 150
- Cessna 172
- Cessna Citation Mustang
- Eclipse 500/550
- Piper Archer
- Piper Seneca

## C-II, D-II

- Cessna Citation X (750)
- Gulfstream 100, 200,300
- Challenger 300/600
- **ERJ-135, 140, 145**
- CRJ-200/700
- Embraer Regional Jet
- Lockheed JetStar
- Hawker 800

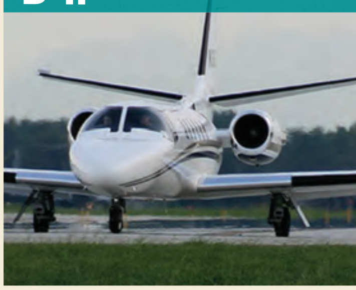
## B-I

- Beech Baron 58
- Beech King Air 100
- Cessna 402
- **Cessna 421**
- Piper Navajo
- Piper Cheyenne
- Swearingen Metroliner
- Cessna Citation I (525)

## C-III, D-III *less than 100,000 lbs.*

- ERJ-170
- CRJ 705, 900
- Falcon 7X
- **Gulfstream 500**, 550, 650
- Global Express, Global 5000
- Q-400

## B-II



- Super King Air 200
- Cessna 441
- DHC Twin Otter
- Super King Air 350
- Beech 1900
- Citation Excel (560), Sovereign (680)
- Falcon 50, 900, 2000
- **Citation Bravo (550)**
- Embraer 120

## C-III, D-III *over 100,000 lbs.*

- ERJ-90
- Boeing Business Jet
- B-727
- **B-737**-300, **700**, 800
- MD-80, DC-9
- A319, A320

## A-III, B-III

- DHC Dash 7
- **DHC Dash 8**
- DC-3
- Convair 580
- Fairchild F-27
- ATR 72
- ATP

## C-IV, D-IV

- **B-757**
- B-767
- C-130 Hercules
- DC-8-70
- MD-11

## C-I, D-I

- Beech 400
- **Lear** 31, **35**, 45, 60
- Israeli Westwind

## D-V

- **B-747-400**
- B-777
- B-787
- A-330, A-340

Note: Aircraft pictured is identified in bold type.



**Exhibit 2M**
**AIRCRAFT REFERENCE CODES**

The AAC, ADG, and runway visual range (RVR) are combined to form the RDC of a particular runway. The RDC provides the information needed to determine certain design standards that apply. The first component, depicted by a letter, is the AAC and relates to aircraft approach speed (operational characteristics). The second component, depicted by a Roman numeral, is the ADG and relates to either the aircraft wingspan or tail height (physical characteristics), whichever is most restrictive. The third component relates to the visibility minimums expressed by RVR values in feet of 1,200 (⅛-mile), 1,600 (¼-mile), 2,400 (½-mile), 4,000 (¾-mile), and 5,000 (1-mile). The RVR values approximate standard visibility minimums for instrument approaches to the runways. The third component should read "VIS" for runways designed for visual approach use only.

***Approach Reference Code (APRC):*** A code signifying the current operational capabilities of a runway and associated parallel taxiway with regard to landing operations. Like the RDC, the APRC is composed of the same three components: the AAC, ADG, and RVR. The APRC describes the current operational capabilities of a runway under particular meteorological conditions where no special operating procedures are necessary, as opposed to the RDC which is based upon planned development with no operational component. The APRC for a runway is established based upon the minimum runway to taxiway centerline separation.

***Departure Reference Code (DPRC):*** A code signifying the current operational capabilities of a runway and associated parallel taxiway with regard to takeoff operations. The DPRC represents those aircraft that can takeoff from a runway while any aircraft are present on adjacent taxiways, under particular meteorological conditions with no special operating conditions. The DPRC is similar to the APRC, but is composed of two components: ACC and ADG. A runway may have more than one DPRC depending on the parallel taxiway separation distance.

## *CRITICAL DESIGN AIRCRAFT*

The selection of appropriate FAA design standards for the development and location of airport facilities is based primarily upon the characteristics of the aircraft which are currently using or are expected to use an airport. The critical design aircraft is used to define the design parameters for an airport. The design aircraft may be a single aircraft or a composite aircraft representing a collection of aircraft classified by the three parameters: AAC, ADG, and TDG. In the case of an airport with multiple runways, a design aircraft is selected for each runway.

The first consideration is the safe operation of aircraft likely to use an airport. Any operation of an aircraft that exceeds design criteria of an airport may result in either an unsafe operation or a lesser safety margin; however, it is not the usual practice to base the airport design on an aircraft that uses the airport infrequently.

**The design aircraft is defined as the most demanding category of aircraft, or family of aircraft, which conducts at least 500 itinerant operations per year at an airport or the most demanding aircraft in regularly scheduled commercial service.** Planning for future aircraft use is of particular importance since the design standards are used to plan separation distances between facilities. These future standards must be considered now to ensure that short term development does not preclude the reasonable long range potential needs of the airport.

According to FAA AC 150/5300-13A, *Airport Design*, "airport designs based only on existing aircraft can severely limit the ability to expand the airport to meet future requirements for larger, more demanding aircraft. Airport designs that are based on large aircraft never likely to be served by the airport are not economical." Selection of the current and future critical design aircraft must be realistic in nature and supported by current data and realistic projections.

## AIRPORT DESIGN AIRCRAFT

The airport experiences frequent activity by both commercial service and business jets. The commercial service jets currently in service at the airport are the Embraer ERJ-140-series and Bombardier CRJ-200 regional jets as operated by American Eagle and United Express. The Airport experiences activity by the largest business jets, including the Gulfstream V, Gulfstream 650, and Bombardier Global Express.

The FAA maintains the Traffic Flow Management System Count (TFMSC) database which documents certain aircraft operations at airports. Information is added to the TFMSC database when pilots file flight plans and/or when flights are detected by the National Airspace System, usually via radar. It includes documentation of commercial traffic (air carrier and air taxi), general aviation, and military aircraft. Due to factors, such as incomplete flight plans and limited radar coverage, TFMSC data does not account for all aircraft activity at an airport by a given aircraft type. Therefore, it is likely that there are more operations at the airport than are captured by this methodology. TFMSC data is available for activity at Santa Fe Municipal Airport and was utilized in this analysis.

**Exhibit 2N** presents the TFMSC annual jet activity from 2010 through May 2015. As can be seen, several types and sizes of jets can and do operate at the airport. The exhibit also shows the breakout of these jets by AAC and ADG. Over the sample period, the greatest number of operations in any single design family combined was 23,734 in C-II. These accounted for approximately 45 percent of logged jet activity. The most demanding jets, in terms of design standards, to operate at the airport regularly during the time period are those in design categories C-II, C-III, and D-II and include the ERJ 140-series regional jet, CRJ-200 regional jet, Citation X, Challenger 300, Hawker 800/1000/4000, Gulfstream 200, Gulfstream 400, and Gulfstream 500. Overall, the most demanding jets to utilize the airport in terms of AAC were military jets, such as the F-15, F/A-18, and F-16, which fall in AACs D and E. The most demanding jets in terms of ADG were the Boeing 757, KC-135, and DC-10s, which fall in ADG IV. These jet aircraft have operated at the airport on a very limited basis in the past.

Santa Fe Municipal Airport has exhibited a long term trend of significant jet aircraft activity. The majority of these operations have been conducted by business jets; however, commercial airline aircraft have also utilized the airport on a regular basis and constitute a substantial number of operations. Between 2010 and 2014, total jet activity has averaged 9,768 operations per year, and the trend has been increasing in recent years with the airport averaging 10,510 annual jet aircraft operations in 2013 and 2014.

### JET OPERATIONS BY AIRPORT REFERENCE CODE

| ARC | Aircraft | 2010 | 2011 | 2012 | 2013 | 2014 | 2015* |
|---|---|---|---|---|---|---|---|
| A-I | Citation Mustang | 56 | 78 | 102 | 122 | 116 | 38 |
| | Eclipse 500 | 24 | 38 | 30 | 40 | 52 | 22 |
| **Total** | | **80** | **116** | **132** | **162** | **168** | **60** |
| B-I | Beechjet 400 | 540 | 486 | 538 | 524 | 530 | 214 |
| | Citation CJ 1/2/3/4 | 718 | 698 | 622 | 594 | 616 | 216 |
| | Citation I/SP | 84 | 58 | 40 | 50 | 40 | 26 |
| | L-39 Albatros | 2 | 10 | 10 | 10 | 2 | 4 |
| | Mitsubishi MU-300 | 10 | 6 | 6 | 2 | 0 | 0 |
| | Phenom 100 | 64 | 94 | 138 | 210 | 268 | 92 |
| | Rockwell Sabre 40/60 | 10 | 4 | 6 | 12 | 0 | 2 |
| | Falcon 10 | 20 | 4 | 8 | 6 | 6 | 0 |
| | Raytheon Premier 1 | 60 | 104 | 132 | 76 | 84 | 20 |
| **Total** | | **1,508** | **1,464** | **1,500** | **1,484** | **1,546** | **574** |
| B-II | Citation Bravo | 344 | 168 | 172 | 148 | 134 | 48 |
| | Citation Excel/XLS | 748 | 759 | 718 | 788 | 778 | 252 |
| | Citation II/SP | 42 | 42 | 42 | 0 | 4 | 26 |
| | Citation III/VI/VII | 116 | 106 | 116 | 96 | 112 | 32 |
| | Citation Sovereign | 244 | 234 | 230 | 224 | 200 | 80 |
| | Citation Ultra/Encore | 522 | 508 | 452 | 492 | 538 | 160 |
| | Fairchild Dornier 328 | 12 | 4 | 0 | 0 | 6 | 0 |
| | Falcon 20/50 | 100 | 136 | 92 | 114 | 102 | 44 |
| | Falcon 900/2000 | 200 | 224 | 186 | 276 | 256 | 74 |
| | Phenom 300 | 28 | 60 | 90 | 132 | 294 | 110 |
| **Total** | | **2,356** | **2,241** | **2,098** | **2,270** | **2,424** | **826** |
| C-I | Bae Systems Hawk | 14 | 30 | 26 | 0 | 2 | 16 |
| | BAe HS 125-1/2/3/400/600 | 8 | 6 | 6 | 12 | 0 | 0 |
| | IAI 1124 Westwind | 58 | 84 | 74 | 74 | 86 | 16 |
| | Learjet 24/25 | 22 | 12 | 14 | 12 | 2 | 2 |
| | Learjet 31/35/36 | 258 | 254 | 216 | 206 | 176 | 80 |
| | Learjet 40/60 | 690 | 720 | 662 | 518 | 502 | 152 |
| **Total** | | **1,050** | **1,106** | **998** | **822** | **768** | **266** |
| C-II | Challenger 300 | 218 | 206 | 182 | 244 | 300 | 82 |
| | Challenger 600/601/604 | 142 | 136 | 92 | 76 | 126 | 22 |
| | Citation X | 456 | 500 | 464 | 514 | 456 | 142 |
| | CRJ 100/200 | 0 | 0 | 94 | 698 | 664 | 360 |
| | ERJ 135/140/Legacy | 1,670 | 1,378 | 1,344 | 1,050 | 796 | 280 |
| | ERJ 145/EX | 904 | 1,134 | 1,306 | 1,978 | 2,472 | 820 |
| | IAI Astra 1125 | 36 | 32 | 26 | 50 | 52 | 22 |
| | MD-80 Series | 0 | 0 | 0 | 0 | 2 | 0 |
| | Gulfstream 300 | 18 | 20 | 10 | 10 | 14 | 2 |
| | Hawker 800/1000/4000 | 424 | 370 | 428 | 398 | 402 | 112 |
| **Total** | | **3,868** | **3,776** | **3,946** | **5,018** | **5,284** | **1,842** |
| C-III | BD Global 5000 | 2 | 0 | 4 | 22 | 20 | 2 |
| | BD Global Express | 34 | 12 | 34 | 36 | 28 | 2 |
| | Boeing 737 | 0 | 2 | 2 | 0 | 0 | 0 |
| | Falcon 7X | 0 | 2 | 6 | 4 | 8 | 2 |
| | Gulfstream 500 | 44 | 32 | 66 | 58 | 72 | 12 |
| **Total** | | **80** | **48** | **112** | **120** | **128** | **18** |

### JET OPERATIONS BY AIRPORT REFERENCE CODE (continued)

| ARC | Aircraft | 2010 | 2011 | 2012 | 2013 | 2014 | 2015* |
|---|---|---|---|---|---|---|---|
| C-IV | Boeing 757-200 | 2 | 0 | 0 | 0 | 0 | 0 |
| | KC-135 | 2 | 0 | 0 | 0 | 2 | 0 |
| **Total** | | | **4** | **0** | **0** | **0** | **20** |
| D-I | F/A-18 Hornet | 16 | 20 | 10 | 6 | 8 | 0 |
| | F-15 Eagle | 2 | 2 | 0 | 0 | 0 | 0 |
| **Total** | | | **18** | **22** | **10** | **6** | **80** |
| D-II | Gulfstream 400 | 258 | 198 | 218 | 230 | 184 | 64 |
| | Gulfstream G150 | 32 | 64 | 30 | 66 | 38 | 14 |
| | Gulfstream 200 | 146 | 150 | 186 | 172 | 108 | 32 |
| **Total** | | **436** | **412** | **434** | **468** | **330** | **110** |
| D-IV | DC-10/30/40 | 0 | 0 | 0 | 6 | 6 | 0 |
| **Total** | | | **0** | **0** | **0** | **6** | **6** |
| E-I | F-16 Falcon | 4 | 0 | 0 | 0 | 0 | 0 |
| **Total** | | **4** | **0** | **0** | **0** | **0** | **0** |
| **Annual Total** | | **9,404** | **9,185** | **9,230** | **10,356** | **10,664** | **3,696** |

### AIRPORT REFERENCE CODE OPERATIONS SUMMARY

**Jet Operations by Airport Reference Code**

| ARC | 2010 | 2011 | 2012 | 2013 | 2014 | 2015* |
|---|---|---|---|---|---|---|
| A-I | 80 | 116 | 132 | 162 | 168 | 60 |
| B-I | 1,508 | 1,464 | 1,500 | 1,484 | 1,546 | 574 |
| B-II | 2,356 | 2,241 | 2,098 | 2,270 | 2,424 | 826 |
| C-I | 1,050 | 1,106 | 998 | 822 | 768 | 266 |
| C-II | 3,868 | 3,776 | 3,946 | 5,018 | 5,284 | 1,842 |
| C-III | 80 | 48 | 112 | 120 | 128 | 18 |
| C-IV | 4 | 0 | 0 | 0 | 2 | 0 |
| D-I | 18 | 22 | 10 | 6 | 8 | 0 |
| D-II | 436 | 412 | 434 | 468 | 330 | 110 |
| D-IV | 0 | 0 | 0 | 6 | 6 | 0 |
| E-I | 4 | 0 | 0 | 0 | 0 | 0 |
| **Total** | **9,404** | **9,185** | **9,230** | **10,356** | **10,664** | **3,696** |

**Jet Operations By Approach Category**

| AAC | 2010 | 2011 | 2012 | 2013 | 2014 | 2015* |
|---|---|---|---|---|---|---|
| A | 80 | 116 | 132 | 162 | 168 | 60 |
| B | 3,864 | 3,705 | 3,598 | 3,754 | 3,970 | 1,400 |
| C | 5,002 | 4,930 | 5,056 | 5,960 | 6,182 | 2,126 |
| D | 454 | 434 | 444 | 480 | 344 | 110 |
| E | 4 | 0 | 0 | 0 | 0 | 0 |
| **Total** | **9,404** | **9,185** | **9,230** | **10,356** | **10,664** | **3,696** |

**Jet Operations By Airplane Design Group**

| ADG | 2010 | 2011 | 2012 | 2013 | 2014 | 2015* |
|---|---|---|---|---|---|---|
| I | 2,660 | 2,708 | 2,640 | 2,474 | 2,490 | 900 |
| II | 6,660 | 6,429 | 6,478 | 7,756 | 8,038 | 2,778 |
| III | 80 | 48 | 112 | 120 | 128 | 18 |
| IV | 4 | 0 | 0 | 6 | 8 | 0 |
| **Total** | **9,404** | **9,185** | **9,230** | **10,356** | **10,664** | **3,696** |

* 2015 Data through May

Source: Traffic Flow Management System Counts



**Exhibit 2N**
**AIRCRAFT OPERATIONS BY REFERENCE CODE**

This page intentionally left blank

The aviation demand forecasts indicate the potential for continued growth in jet activity at the airport. This includes a forecast increase in based business jets and commercial service operations through the 20-year planning horizon. The type and size of jet aircraft using the airport regularly can impact the design standards to be applied to the airport system. Therefore, it is important to have an understanding of what type of aircraft may use the airport in the future. Factors such as population and employment growth in the airport service area, the proximity and level of service of other regional airports, and development at the airport can influence future activity.

## RUNWAY DESIGN CODE (RDC)

Each runway is assigned an RDC. The RDC relates to specific FAA design standards that should be met in relation to each runway.

*Future planning should consider the increased use of larger business jets at the airport, in addition to the potential emergence of larger commercial service aircraft including 70- and 90-seat regional jets.*

### Runway 2-20

Runway 2-20 is the primary runway and should be designed to accommodate the critical design aircraft. This runway is 8,366 feet long by 150 feet wide and has an instrument landing system (ILS) providing visibility minimums as low as ¾-mile for instrument approaches to Runway 2. The current ALP for the airport defines Runway 2-20 as an existing ARC D-II and ultimate ARC D-III. (Note: The updated AC would classify Runway 2-20 as existing RDC D-II and ultimate RDC D-III).

According to the TFMSC data, operations by aircraft in AAC D have not exceeded the 500 operations threshold. Over the past five years, operations in AAC D have averaged approximately 430 annually, with the highest one-year total being 480 in 2013. While this does not meet the design threshold, the level of operations is considerable. Unless there is a discernable decreasing trend in operations by aircraft in this category, an airport should not be downgraded. **Therefore, this Master Plan will utilize an existing RDC of D-II-4000 for Runway 2-20**. Future planning should consider the increased use of larger business jets at the airport, in addition to the potential emergence of larger commercial service aircraft including 70- and 90-seat regional jets. Furthermore, the airport achieving visibility minimums down to ½-mile associated with the ILS precision approach on its primary runway would be advantageous for commercial service operations. As a result, **the future RDC for Runway 2-20 is D-III-2400**.

### Runway 15-33

A crosswind runway primarily functions to provide an alternate runway for periods when wind conditions do not favor the primary runway orientation. Runway 15-33 is the main crosswind runway measuring 6,316 feet long and 100 feet wide. This runway is utilized primarily by general aviation aircraft when the winds dictate or as directed by the tower. The runway is designated as being able to accommodate commercial service operations when needed and does so occasionally. **The existing RDC for Runway 15-33 is C-II-5000.** It should continue to be planned for occasional use by commercial service aircraft, as well as the increased use of larger business jets. In addition, it would be advantageous for the runway to be served by improved instrument approach visibility minimums down to ¾-mile. As such, **the ultimate RDC is C-III-4000**.

### Runway 10-28

Runway 10-28 is the secondary crosswind runway, which is 6,301 feet long and 75 feet wide. This runway is most heavily used by general aviation aircraft as the winds dictate or as the tower instructs. **The existing RDC for Runway 10-28 is B-II-5000. The RDC is planned to remain B-II-5000 into the future.**

### Airport Design Summary

**Table 2S** summarizes the design aircraft components as applied currently to the airport and the runways. The ultimate RVR (visibility) components for Runways 2-20 and 15-33 may change based on analysis and recommendations regarding potential instrument approach capability.

**TABLE 2S**
**Design Aircraft Parameters**
**Santa Fe Municipal Airport**

| Runway Design Parameters | Runway Design Code (RDC) | Approach Reference Code (APRC) | Departure Reference Code (DPRC) |
|---|---|---|---|
| **EXISTING** | | | |
| Runway 2-20<br>(400' rwy/twy separation) | D-II-4000 | D/IV/4000<br>D/V/4000 | D/IV<br>D/V |
| Runway 15-33<br>(no existing parallel taxiway) | C-II-5000 | N/A | N/A |
| Runway 10-28<br>(240' rwy/twy separation) | B-II-5000 | B/II/5000 | B/II |
| **ULTIMATE** | | | |
| Runway 2-20<br>(400' rwy/twy separation) | D-III-2400 | D/IV/2400<br>D/V/2400 | D/IV<br>D/V |
| Runway 15-33<br>(potential for no less than 400' rwy/twy separation) | C-III-4000 | D/IV/4000<br>D/V/4000 | D/IV<br>D/V |
| Runway 10-28<br>(240' rwy/twy separation) | B-II-5000 | B/II/5000 | B/II |

Source: FAA AC 150/5300-13A, Change 1, *Airport Design*

## *SUMMARY*

Santa Fe Municipal Airport is a significant aviation facility that serves a vital function for the regional economy. As a general observation, the airport is well-positioned for growth in the future. The next step in the planning process is to assess the capabilities of the existing facilities to determine what upgrades may be necessary to meet future demands. The range of forecasts developed here will be taken forward in the next chapter as planning horizon activity levels that will serve as milestones or activity benchmarks in evaluating facility requirements.