4. Forecast of Aviation Activity and System Demand

4.1. Introduction

This chapter of the 2020 SDSASP provides projections of future aviation activity at the 56 system airports. This task is an important component to the system planning process as it provides a historical reference of activity changes in the past, and projects changes to come over the 20-year planning horizon. These changes in aviation activity impact the aviation system's ability to support capacity and demand requirements. Developing forecasts of operations, based aircraft, and enplanements that are accurate and reliable can be challenging since aviation activity is impacted by changes in the economy, government regulations, and technological advances. To account for these uncertainties and overcome the inherent challenges associated with aviation forecasts, a variety of forecasting methods are employed to identify the most realistic projections of demand, including enplanements, operations, and based aircraft. These methods are informed by industry and socioeconomic trends – both of which are discussed in this chapter.

The 2020 SDSASP forecasts use 2018 as the base year for analysis as it was the latest full year of data available at the time the forecasts were conducted. Projections are provided on a short- (5 years), intermediate- (10 years), and long-term (20 years) basis. The results of the forecasting effort help identify system capacity constraints and are used to make recommendations for system enhancement that will meet the needs of existing and future system users.

4.2. National Aviation Trends

The national aviation industry has seen several significant changes over the past 10 years, impacting commercial service, general aviation (GA), or both. These trends are reported as occurring at the national level, but their impacts are felt by communities and airports of all sizes across the country. This section reviews the trends impacting the aviation industry as a whole, followed by trends that impact commercial service more directly.

4.2.1. Aviation Industry Trends

While commercial service and GA are two very different types of aviation activity, they are both currently being impacted (positively and negatively) by a variety of national trends. This section highlights the national trends impacting the aviation industry as a whole.

4.2.1.1. Oil Prices

The aviation industry is very susceptible to any fluctuations in the oil industry, particularly in terms of oil prices. Since fuel is the largest operating expense for all aircraft operators, changes to oil prices impact all aviation operations, regardless of type of aircraft (except for electric-powered).

Oil prices have consistently been on the rise since 1998, with a startling peak occurring during 2008, corresponding with the Great Recession years. While oil prices dropped drastically after the 2008 peak, they continued to rise after 2009 (fluctuating between $65 and $110 per barrel) until 2014 when the price per barrel began to drop. In 2016 the industry saw the lowest cost per barrel in recent history, with costs dropping below $40. Prices rebounded after 2016 but have consistently remained at or below the $75 mark since that time. **Figure 4-1** shows the fluctuation in oil prices over the last 10 years, from 2008 to 2018.

Figure 4-1: Cost of Oil per Barrel, 2008-2018

Source: https://www.macrotrends.net/1369/crude-oil-price-history-chart

The relatively lower oil prices in recent years have benefitted the aviation industry by lowering operating costs, and in many cases, lowering consumer costs. According to the Federal Aviation Administration's (FAA) *2019-2039 FAA Aerospace Forecast* (further referred to as *Aerospace Forecast),* oil prices are anticipated to decrease to $59 per barrel in 2021, but rise gradually thereafter through the planning horizon, reaching $100 per barrel by 2039.[1] If oil prices continue to rise, and the cost of oil exceeds previous peaks of approximately $110/barrel (adjusted for inflation), it is likely the aviation industry will see the negative impacts of higher operating costs. High oil costs correlate to high consumer costs, which could deter travel spending to South Dakota, both for commercial service and GA airports.

4.2.1.2. U.S. Pilot Population

For years analysts have been concerned about an airline pilot shortage based on changing federal requirements related to training, certification, and an aging pilot population. For example, the "1,500 hour" rule implemented in 2013 requires first officers, commonly known as co-pilots, to hold both an Airline Transport Pilot (ATP) certification and a commercial pilot certification. Previously co-pilots were only required to hold a commercial pilot certification. Prerequisites for ATP certification include at least 1,500 hours logged as a pilot, compared to only 250 hours required to hold a commercial pilot certification. This new "1,500 hour" rule discouraged some prospective pilots from continuing their ATP certification due to a significant increase in flight training costs. Although it was anticipated that this new rule would cause prolonged shortage of commercial service pilots, the *Aerospace Forecast* shows

[1] *2019-2039 FAA Aerospace Forecast*, pg. 52, 2019.

steady growth in active pilots with ATP certificates through the planning period. However, even with this growth, regional airlines are still struggling to hire and retain pilots as older generations retire from the mainline carriers and hire from the regionals to replace them.

While it is projected that commercial service pilot levels will increase over the planning period, the number of GA pilots is expected to decrease between 2018 and 2039. To help boost pilot numbers across the country, the FAA has changed some regulations. A 2016 policy change removed the expiration date on new student pilot certificates, creating an increase of 39,303 student pilot certifications from 2016 to 2018. According to the 2019 *Aerospace Forecast*, "the 2016 rule change generated a cumulative increase in certificate numbers and breaks the link between student pilot and advanced certificate levels of private pilot or higher."[2] Despite the increase in student pilots attributed to this rule, the change is too new to determine a reliable forecast for student pilots.

A decrease in active GA pilots could affect important industries in South Dakota, such as the prolific agricultural spraying industry. Moreover, the pheasant hunting community and seasonal tourism (particularly the Sturgis Motorcycle Rally) in South Dakota rely on GA pilots to bring visitors to the state who wish to travel via private aviation or can't otherwise reach locations in South Dakota. Fewer active GA pilots also has the potential to impact private business travel with a smaller pool of potential corporate and charter pilots.

Helping to counteract the decrease in the aviation workforce, South Dakota has two educational programs supporting careers in aviation, including pilots and maintenance technicians. South Dakota State University (SDSU) is a four-year accredited aviation program that accounts for approximately 70 FAA check rides a year and has doubled enrollment to 150 students in the past three years. Increased recruiting, airline salaries and pilot job placement rates have driven the increased growth resulting in record enrollment in a professional pilot education degree. In addition to the SDSU program, a new professional pilot program at Lake Area Technical Institute (LATI) is expected to produce new pilots by the summer of 2021. This new professional pilot program is gaining significant interest from prospective students and new students are already applying for Fall 2020 enrollment. LATI also offers an FAA certified Airframe and Powerplant program (A&P) that prepares students for aircraft maintenance and technician careers. The A&P program has been graduating an average of 12 students per year for the past five years, and this year the program has 34 students enrolled. Several A&P students are also training for private or instrument ratings for pilot licensure. LATI expects both programs to continue to grow in the foreseeable future.

4.2.1.3. Aircraft Fleet

According to the *Aerospace Forecast*, a growing mainline air carrier fleet is predicted to take place at a Compound Annual Growth Rate (CAGR) of about 1.1 percent per year through 2039, amounting to almost 1,000 new passenger jet aircraft being introduced. Growth in the mainline carrier fleet will continue to be seen in the large jets as they replace less efficient, regional aircraft with more fuel-efficient, larger aircraft. For regional air carriers, the fleet of jets will remain relatively stable with an annual growth rate of 0.4 percent over the planning period, compared to non-jet aircraft which are quickly being phased out of the regional air carrier fleet at a rate of -5.4 percent annually.

[2] *2019-2039 FAA Aerospace Forecast*, pg. 27, 2019.

On the GA side, the overall aircraft fleet is predicted to remain at current levels with 0.0 percent growth through 2039. Within the GA fleet, fixed-wing turbine aircraft levels are predicted to grow at a rate of 1.8 percent annually, offsetting the continued decline (-1.0 percent annually) of active fixed-wing piston aircraft levels. This decline is suspected to be due to unfavorable pilot demographics, increasing cost of aircraft ownership, in conjunction with these aircraft not being replaced at the rate in which they are being retired.[3] Rotorcraft, experimental, and light sport aircraft are all expected to grow but make up a fairly small share of the fleet, limiting impact on the overall GA aircraft fleet growth. The implications of a growing GA jet aircraft fleet could be challenging for GA airports that are not currently equipped to accommodate such aircraft. Several GA facilities lack the runway length, approaches, and/or services to promote jet aircraft usage. A decline in fixed-wing piston aircraft combined with a reduction in active recreational and private pilots could lead to a decrease in activity at airports serving smaller aircraft.

4.2.1.4. Air Traffic Control

The FAA operates the nation's air traffic control (ATC) system using a three-pronged system of local airport tower controllers, terminal radar approach (TRACON), and regional air route traffic centers (also known as en-route centers). Over the past several decades the FAA has received intense scrutiny for inefficiency and failing to keep pace with modern technologies and airspace demands. Critics of the FAA argue that the agency has taken far too long to implement NextGen and other modernization initiatives, while FAA supporters remark the agency has been crippled by inconsistent funding and budget cuts. Most recently, in June 2017, President Trump proposed a plan to privatize the nation's ATC system. The President argued privatization could lead to reduced wait times, increased route efficiency, and fewer delays. The proposal would lead to a private, nonprofit corporation governed by a board of representatives (primarily comprised of the major airlines), taking control of the management and operations of the ATC in the U.S. from the FAA. The corporation would be financed with user fees instead of tax dollars. Opponents of this proposal advise that privatization could shift costs to passengers, and place particular hardships on small, rural airports and the communities they serve. A study published by Delta Air Lines in 2016 found that privatization could lead to an increase of ticket costs by 20 to 29percent after ten years and result in the closure of small airports located outside of major urban centers.[4] In addition to impacts on commercial service, GA pilots and users will be subject to a privatized air traffic control system in which they have limited voice and may experience reduced and/or limited access to airspace and airports. While it is unknown to what extent aviation system users will be impacted, the proposed privatization could increase travel costs for residents and visitors of South Dakota who may choose to travel by car if the price increase is significant. If enough traffic is lost at the smaller commercial service airports, suspension or loss of air service is possible.

4.2.2. Commercial Service Trends

The commercial service industry in the U.S. is greatly influenced by changes to the nation's economy, seeing major changes during and after the Great Recession of 2007-2009. To weather the recession and emerge profitable afterward, airlines employed numerous techniques including airline consolidation, capacity maximization, and revenue generation through ancillary revenues, each of which are still in place today. The following sections provide additional detail on the changing commercial service market.

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[3] *2019-2039 FAA Aerospace Forecast*, pg. 24, 2019.

[4] Delta Airlines, *The Costs of Privatizing Air Traffic Control and How It Will Impact Airline Travelers*, 2016

4.2.2.1. Industry Consolidation and Restructuring

Challenging economic times prompted several airline mergers and acquisitions over the past decade. U.S. airline consolidation and restructuring became common place after the Great Recession. Prior to 2005 there were 11 major mainline carriers (those providing service primarily via aircraft with 90 or more seats) in the U.S. Beginning in 2005, but becoming commonplace during and after the Great Recession, those 11 mainline carriers have been consolidated and reduced down to five airlines. The most recent consolidation occurred in 2016 when Alaska Airlines acquired Virgin America. These five mainline carriers control roughly 85 percent of the domestic market, as measured by revenue passenger miles (RPMs).[5] **Figure 4-2** shows the consolidations that have occurred since 2005, which have resulted in five mainline carriers that are dominating the market at the time of this study.

Figure 4-2: Airline Consolidation Between 2005 and 2016

Source: Kimley-Horn, 2020

In general, airline consolidation tends to decrease competition, which can result in higher passenger fees and service reductions as airlines eliminate less-profitable routes. However, consolidations among smaller regional carriers can result in different impacts, such as a reduction in fares, as these airlines strive to compete with others of similar size. South Dakota is served by the "big three" with United serving Rapid City, Sioux Falls, Pierre, and Watertown; Delta serving Aberdeen, Sioux Falls, and Rapid City; and American serving Rapid City and Sioux Falls. Some of this service is provided by regional carriers doing business as one of the mainline carriers. United Airlines service at Pierre and Watertown and Delta Airlines service at Aberdeen are being provided through the U.S. Department of Transportation's Essential Air Service (EAS) Program which subsidizes routes to communities that otherwise would not receive air service due to limited demand and/or profitability.

[5] An RPM is a fare-paying passenger transported one mile and the most common measure of demand for air travel.

The emergence of low-cost and ultra-low-cost carriers (LCCs/ULCCs), such as Spirit, Frontier, and Allegiant Airlines, has created some challenges for U.S. mainline carriers as they compete for market share. These LCCs and ULCCs typically promise low base fares by charging high fees for amenities such as specific seat selection, baggage and food, and specifically target their routes to serve traditionally underserved areas that have been neglected in the existing marketplace and vacation destinations. These lower cost airlines are therefore able to reduce cost per available seat mile (ASM)[6], reduce flight costs, and implement improvements to increase their competitive positions. South Dakota is served by Frontier Airlines in Sioux Falls, and Allegiant Airlines in Sioux Falls and Rapid City. Most of this service is targeted toward the vacation traveler market, and therefore some routes are seasonal taking South Dakota residents to vacation destinations and bringing vacationers to experience South Dakota's Black Hills and Badlands (among other attractions and events).

4.2.2.2. Continued Capacity Discipline

As a result of the semi-recent industry consolidation and restructuring, airlines continue to maintain capacity discipline by making sure capacity does not outweigh demand. To sustain a lean business practice and rebound from recent economic downfalls, airlines are doing their due diligence to ensure that their aircraft are running as close to capacity as possible in an effort to earn maximum revenue per flight. Capacity discipline is measured by ASM, which according to the *Aerospace Forecast*, has increased by 4.6 percent annually since 2014. The FAA cites a variety of factors contributing to the sustained increase in ASM, including up-gauging and the expansion of ultra-low-cost carriers and the competitive response by major carriers, largely driven by low fuel prices.[7]

4.2.2.3. Ancillary Revenues

As previously mentioned, LCCs and ULCCs are able to keep their fares low by charging extra for amenities, such as specific seat selection, baggage, food, and beverages. In a similar fashion, other major airlines have begun charging for non-ticket amenities to boost revenues. This revenue is called ancillary revenue and it is a recent outcome of the domestic and global economic downtown. Ancillary revenues are generally associated with new types of user fees, and include charging the passenger for baggage, priority boarding, seat selection, wireless internet, and in-flight entertainment. These changes to more traditional pricing models are a result of the unbundling of services previously included in a ticket price. The newest ancillary revenue strategy was introduced by Delta in 2015 and is referred to as "Basic Economy" airfare. A Basic Economy fare provides the customer with a main cabin experience at lower cost, in exchange for fewer options and additional restrictions, such as prohibiting a carry-on bag. By 2017, Basic Economy fares were available for all domestic Delta flights, and all domestic American Airlines flights. United joined the Basic Economy bandwagon, but quickly reduced the scale of their deployment as the reduction in revenue was more than anticipated. In some cases, it appears these user fees help to bring the cost of airfare down, but in many cases the end result is the same for the user if they purchase the additional options and the revenue for the airline increases. South Dakotans and visitors have options to purchase the Basic Economy tickets at a lower price when traveling out of airports served by United, Delta, and American, but don't reap the benefits of lower airfare unless they decline the additional amenities.

[6] ASMs are calculated by multiplying the available seats for a given plane by the number of miles that plane will be traveling for a given flight.

[7] *2019-2039 FAA Aerospace Forecast*, pg. 11, 2019.

4.2.3. Summary of Factors Influencing South Dakota Aviation

Fluctuations in the economy, trends in aircraft production and operation, regulatory changes, and evolving active pilot populations are just a few of the industry trends impacting aviation in South Dakota and the nation. These trends are important to consider as they influence future aviation activity levels, which ultimately impact the facilities and services needed to serve aviation demand.

Table 4-1 includes a summary of the trends positively and negatively impacting the national aviation system.

Table 4-1: Factors Influencing the National Aviation Industry

Positive Factors	Negative Factors
Commercial Service	
GROWTH IN ATP CERTIFICATES More than 25,000 additional ATP certificates are projected to be issued to airline pilots over the next 20 years. While this growth is beneficial, it still isn't enough to offset the greater predicted pilot shortage.	ROUTE CONSOLIDATION As airlines continue to recover from the recession, they're focus on maximizing profits has resulted in the changing and consolidation of routes, limiting options once available to destinations on routes less profitable than others.
EMERGENCE OF LCCs AND ULCCs Competition among airlines is strong as LCCs and ULCCs emerge and expand in the marketplace, controlling airfare pricing for travelers, especially those traveling for leisure.	INCREASE IN ANCILLARY REVENUES Costs for "extras" like checked baggage, seat selection, and food and drinks historically charged by LCCs and ULCCs to keep ticket costs low are now being charged by the mainline carriers offering lower cost ticket classes.
CS FLEET CHANGES Mainline air carriers are phasing out smaller, less efficient regional aircraft, while regional air carriers are phasing out their non-jet aircraft. These efforts to modernize the commercial service fleet promotes an enhanced passenger experience.	CHANGING INFRASTRUCTURE NEEDS Mainline and regional air carriers' efforts to modernize and up-gauge their fleets also require airports to up-gauge their infrastructure to service these aircraft. Smaller airports supporting commercial service are impacted the most.
General Aviation	
LOWER OIL PRICES Lower, more stable oil prices in recent years (and as projected in the mid-term) have resulted in lower operating costs for aircraft owners and lower consumer costs for aircraft charter. Total fuel consumed by GA aircraft is expected to grow 1.5% annually through 2039. Oil prices are expected to rise in the long-term which could reverse these positive impacts over the planning period.	SHRINKING PRIVATE PILOT POPULATIONS The number of active private pilots has been shrinking significantly since the Great Recession and is expected to continue declining at a rate of -0.7% annually over the 20-year forecast period. The reason for this decline is thought to be three-fold – current and prospective pilots don't have the time, disposable income, and health required to obtain and maintain a private pilot certificate.
JET AIRCRAFT FLEET EXPANSION While the total active GA and air taxi fleet in the U.S. is expected to remain completely flat over the next 20 years, the turbo jet sector of the fleet is anticipated to see significant growth at 2.2% annually through 2039, offsetting the decline in single-engine piston aircraft.	SINGLE-ENGINE PISTON FLEET REDUCTION The fleet of single-engine piston aircraft has been shrinking for some time as these aircraft age and are removed from service, without being replaced by new single-engine piston aircraft. The FAA predicts a gradual, but continuous loss of this sector of the active GA fleet at a rate of -1.0% annually through 2039.
GROWTH IN TURBINE ACTIVITY Similar to the growth in the jet aircraft fleet, the hours flown by turbine aircraft (turbo prop and turbo jet) are expected to increase 2.4% annually over the 20-year horizon.	MINIMAL GROWTH IN GA ACTIVITY GA and air taxi hours flown be the entire GA fleet are expected to increase by only 0.8% annually over the forecast period. At the same time, minimal growth in GA operations is been predicted to occur at all towered airports for the next 20 years at 0.3% until 2039.

Sources: FAA Aerospace Forecast Fiscal Years 2019-2039; Kimley-Horn, 2020

4.3. Historical and Projected Demographics in South Dakota

Typically, there is a strong connection between socioeconomic factors and activity levels within an aviation system. In addition to providing a general understanding of the existing socioeconomic conditions surrounding an airport, region, or state, this data is instrumental in developing future projections of aviation activity. This section examines several socioeconomic factors, including population, age, employment, gross regional product (GRP), and income. In addition to these socioeconomic factors, this section also considers top industries in the state, such as tourism, agriculture, and pheasant hunting, that are a critical factor in aviation demand levels. Historical data from 1988 was used with a base year of 2018 to evaluate current data, and calculate projections for 2023, 2028 and 2038 to represent the five-, ten-, and 20-year planning horizons. Much of the data used in this section was obtained from Woods and Poole Economics, Inc., an independent firm specializing in long-term national, state, and county economic and demographic projections. For brevity, summaries of the socioeconomic factors are provided in this chapter and **Appendix A – Socioeconomic Data** includes the data tables used in the analysis of growth rates.

4.3.1. Population Trends

In 2018 South Dakota's population was approximately 880,000 residents, and it is estimated the population will increase to a little over one million residents by 2038. Population in South Dakota is expected to increase at a rate of 0.8 percent annually over the 20-year planning horizon. This marginal increase in population for South Dakota is similar to the population growth expected for the U.S. over the same time period, and also aligns with the growth rates expected at the time of the 2010 SDSASP. There are five counties out of 66 in South Dakota that will experience more than 1 percent annual population growth over the 20-year planning horizon. Lincoln County is the third most populated county, encompassing a portion of the Sioux Falls metro area. Lincoln County is expected to experience an annual population growth rate of 2.4 percent, which is double the rate of the other fastest growing counties. The two most populated counties in 2018 were Minnehaha County (home to Sioux Falls) and Pennington County (home to Rapid City), with 206,804 people and 120,235 people respectively. Both are expected to grow at 1.2 percent and 1.1 percent, respectively. Of the 66 counties in South Dakota only 30 are expected to experience an increase in population over the next 20 years. Considering that the counties expected to experience the most population growth are associated with the larger cities indicates a population shift from more rural area to urban areas. **Table A-1** in **Appendix A – Socioeconomic Data** shows all 66 counties, state, and U.S. population growth over the planning period.

4.3.2. Age Trends

The median age in South Dakota is expected to rise from 37 years old to 39 years old over the 20-year planning horizon, at a rate of 0.2 percent annually. The U.S. will experience a median age increase at the same rate, with an increase from 38 years to 40 years over the planning horizon. Ziebach County is expected to experience an aging population at a rate of 1.1 percent, with their median age increasing from 28 years old in 2018, to 36 years old in 2038. Ziebach County is a largely rural county, with an employment rate of 27 percent and 65 percent of the population living under the poverty level.[8] With a relatively stagnant rate of population growth (at 0.4 percent) these factors could be contributing to an aging population, as younger people are choosing to move away for more economic opportunities, while older people or those closer to retirement are looking for affordable and rural communities to live.

[8] American Fact Finder, *2013-2017 American Community Survey 5-Year Estimates*, 2017.

There are seven counties in South Dakota that will experience an annual decrease of one percent or more in the median age over the 20-year planning period. Clark County's median age in 2018 was 40 years old, and by 2038 the median age is expected to drop by 1.5 percent annually, to 30 years old. Clark County has a population of a little over 3,600 residents, a median household income of $47,500, and median home value of $81,100, indicating that cost of living is relatively low for Clark County residents.[9] The low cost of living, and the short commute (45 minutes) to Watertown, the fifth largest city in the state, could indicate why the population is expected to become younger over the next 20 years. **Table A-2** in **Appendix A – Socioeconomic Data** shows median age and median age annual growth rates for all 66 counties, the state, and the U.S.

4.3.3. Employment

From 1988 to 2008, South Dakota was experiencing a steady increase in its workforce population, with a total of 558,666 jobs. The Great Recession of 2007-2009 caused a drop in employment numbers, with a loss of 3,989 jobs across the state. By 2010, the workforce surpassed pre-Recession numbers and by 2038, the workforce is expected to reach approximately 800,000 jobs, which is 78 percent of the state's projected population for that same year. The continued increase in jobs across the state is a positive indication of a growing economy that requires more workers over time. Three counties in South Dakota have an expected annual growth rate of jobs that exceeds the state and national overall rate. Meade County's rate is 2.3 percent, which is almost double that of the state and the nation. Meade County's potential growth in employment could be due to its currently healthy economy, with approximately only 1 percent of the population unemployed and 10 percent living under the poverty line (compared to 3.7 percent unemployment rate and 18 percent living below poverty level statewide).[10] Moreover, Meade County has large construction and health care services industries as well as high paying opportunities in the mining, quarrying, oil and gas extraction, utilities, and professional, scientific, & technical services industries.[11] **Table A-3** in **Appendix A – Socioeconomic Data** shows total employment figures for all 66 counties, the state, and the U.S.

4.3.4. Gross Regional Product (GRP)

According to Woods and Poole data, South Dakota is expected to experience an increase in GRP at almost the same rate as the U.S. over the planning period. GRP is the same as Gross Domestic Product (GDP) but measured at the state level. There are ten counties in South Dakota that are expected to experience a higher growth rate to their GRP over the planning period than the national GDP growth rate of 2 percent. Meade County is expected to see a 3 percent growth and Lincoln County is expected to experience 3.2 percent growth over the 20-year period. It is important to note that Meade County is also expected to experience the most growth in employment, while Lincoln County is expected to experience the most population growth between the same 20-year period. The statewide increase in GRP is a positive indication of a growing economy for South Dakota. There are only three counties in South Dakota whose GRP is expected to remain stagnant or decrease only slightly between 2018 and 2038. **Table A-4** in **Appendix A – Socioeconomic Data** shows GRP over the planning period for all 66 counties, the state, and the U.S.

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[9] Data USA, *Profile Clark County, SD,* 2017.
[10] American Fact Finder, *2013-2017 American Community Survey 5-Year Estimates*, 2017.
[11] Data USA, *Profile Meade County, SD*, 2017.

4.3.5. Income Trends

According to Woods and Poole data, the per capita income in South Dakota for 2018 (in 2018 dollars) was $50,430, which is very comparable to the national per capita income of $51,009. When looking over the 20-year projection period it is estimated that per capita income (in 2018 dollars) will increase to $122,150 in South Dakota in 2038. This increase in per capita income is associated with an annual growth rate of 5 percent. When looking at estimates from the previous 2010 SDSASP it was expected that per capita income would increase at a rate of 1.14 percent over the planning period (through 2030). Considering that more people are moving to South Dakota, employment is on the rise, and GRP is growing, it is reasonable that the state's per capita is expected to increase at a higher rate over the projection period. An increase in per capita income is an indication of economic growth and improved quality of life for South Dakotans, along with a greater probability that South Dakota residents are using air transportation with their disposable income. **Table A-5** in **Appendix A – Socioeconomic Data** shows the per capita income (in current dollars) at the county, state, and national levels over the planning period.

4.3.6. Top Industries

South Dakota has a wide variety of recreational and tourist attractions that make the state a sought-after destination for domestic and international travelers. South Dakota is home to the Mount Rushmore National Memorial, Crazy Horse Memorial, Badlands National Park, and Black Hills National Forest, just to name a few. It is also home to the Sturgis Motorcycle Rally, one of the largest motorcycle rallies in the country. An official 2018 count of visitors at the Sturgis Motorcycle Rally determined that 495,000 people came to the event, which was the second highest attendance on record, with 2015 reporting over 700,000 people in attendance. The total economic impact to the state for the 2018 rally was estimated to be $786 million.[12] The Sturgis Motorcycle Rally attendance level has remained high, with visitor estimates for the 2019 rally exceeding 500,000.[13] South Dakota's strong tourism sector promotes economic activity throughout the state and increases aviation activity in the state. In 2018, over 14 million visitors came to South Dakota.[14] In the first six months of 2019 there were more than 400,000 airport arrivals, which is a 9.2 percent increase from the previous year.[15] These statistics indicate the strength of the tourism industry and further emphasize the importance of maintaining a well-functioning aviation system that promotes travel across the state.

One special component to the state's tourism industry is the pheasant hunting activity that occurs seasonally. South Dakota attracts many visitors for their world-renowned pheasant hunting experiences. Over the past 20 years the annual pheasant harvest has dropped below 1 million roosters three times, and those years still harvested well over 900,000 birds.[16] The hunting industry attracts visitors from out of state, and out of the country, that book experiences with outfitters and guides that often include private airfare, accommodation, purchase of equipment, and more. Seasonal hunting impacts the state

[12] The Daily Republic, *Official Sturgis Motorcycle Rally Numbers Show Second Largest Crowd in Past 10 Years*, 2018.
[13] The Associated Press, *Attendance at the 75th Sturgis Motorcycle Rally*, 2015.
[14] Tourism Economics, *Economic Impact of Tourism in South Dakota*, 2018.
[15] United States Census Bureau Newsroom, *79th Sturgis Motorcycle Rally: August 2-11, 2019*, 2019.
[16] SD Game, Fish and Parks, *Hunting in South Dakota*, 2019.

aviation system, as reported by several airport managers citing capacity issues for tie-down and hangar spaces during these peak times.

Tourism is not the only industry driving aviation demand and activity in South Dakota, as the state has a strong agricultural industry, ranking in the top 15 nationally for 16 agricultural categories, including total sales. In 2019, it is estimated that the agricultural industry in South Dakota contributed $11.2 billion in total value-added to the economy, and was responsible for 132,105 jobs, which represents 22 percent of total jobs in the state.[17] A booming agricultural industry adds demand to the aviation system with increased needs for exporting crops and agricultural spraying. A specific look at the economic impact of South Dakota's agricultural spraying activity supported by the state's aviation system is provided in **Chapter 9. South Dakota Aviation Economic Impact Study**.

4.3.7. South Dakota Socioeconomic Trends Summary

The historic and future socioeconomic trends in South Dakota tell the story of a state that continues to see growth in many aspects. It is projected that population will grow in terms of size, become more active in the workforce, earn more money over time, and become active participants in the state's burgeoning economy. While South Dakota's overall socioeconomic growth is in line with the growth expected on the national scale, it is a good indicator that the aviation system will experience sustained activity levels in accordance with the projected growth. Moreover, the strong tourist, hunting, and agriculture industries in the state further indicate increased activity at airports across the system.

4.4. South Dakota Commercial Service Airport Activity Forecasts

This section focuses on the projected activity levels expected at the state's five commercial service airports. Four components are analyzed for commercial service airports – enplanements, based aircraft, commercial operations, GA operations, and military operations. Examining historical and current contexts of commercial service airport activities across the state is crucial to determining future demand projections. Projections were made using historic activity levels and employing a variety of forecast methodologies to calculate estimated activity levels over the 20-year planning horizon. Multiple data sources were considered when developing the forecasts, including the FAA's Terminal Area Forecast (TAF), FAA Passenger Boarding Data, and data derived from the 2020 SDSASP Inventory Form. Forecasts of aviation activity from airport master plans were dated and therefore not used. Forecasts for each of these components have been calculated for near- (5 years), mid- (10 years), and long-term (20 years) planning horizons. Since 2018 serves as the base year for calculations, projections are provided for years 2023, 2028, and 2038. As required by AC 150/5070-7, a comparison of projected activity to the FAA's TAF is provided for all three timeframes. If the system plan forecast exceeds that of the FAA's TAF by more than ten percent in the first five years or 15 percent in the first 10 years, the FAA requires additional explanation.

4.4.1. Enplanement Forecasts

The five commercial service airports included in the 2020 SDSASP handled over 900,000 enplanements in 2018. Enplanements are defined as boarded passengers on a commercial service flight. It is important to project future enplanement activity at South Dakota's commercial service airports as those figures impact demand for adequate terminal building capacity, apron availability and size, airfield design and

[17] SD Department of Agriculture, *2019 South Dakota Agriculture Economic Impact Study*, 2019.

more. It is important to understand how this activity is anticipated to change over time, so facility planning can address capacity issues if needed.

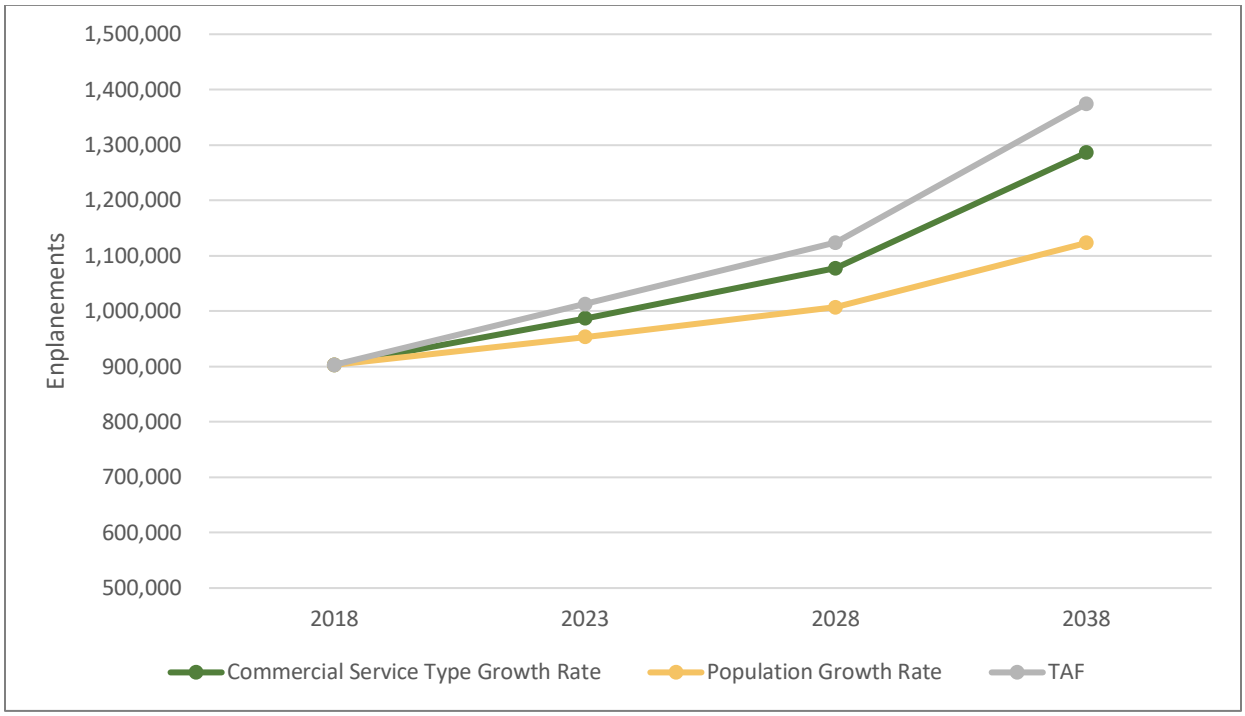
Three data sources for 2018 baseline data were considered when developing projected enplanement activity to determine which data source most accurately depicted future enplanement levels. Those sources were 2018 FAA Passenger Boarding Data, 2018 TAF enplanements, and reported enplanements from the 2020 SDSASP Inventory Form (reporting 2018 numbers). The FAA approved the use of 2018 TAF enplanements as the baseline data for enplanement forecasts.

After selecting the appropriate baseline data, two methodologies were used to forecast enplanements:

- **Commercial Service Type Growth Rate Methodology**: Applies a projected annual growth rate predicted by the FAA in the Aerospace Forecast based on the type of commercial service provided (regional carriers versus mainline carriers). This method assumes that an airport's existing enplanements respond at the same growth or decline that the national market experiences.
- **Population Growth Rate Methodology**: Utilizes South Dakota's projected population growth rates of each county (from Woods & Poole) to the enplanement counts at the airports residing within that county. The annual growth rate was calculated for the population over the time period the enplanements were forecasted.

To determine which methodology presents the most realistic anticipated future conditions of enplanement activity in South Dakota, the results of both methodologies were compared to the FAA's projections of enplanements documented in the TAF. **Figure 4-3** presents the enplanement projections for both methodologies as well as the TAF projections made by the FAA.

Figure 4-3: Enplanement Forecasts, 2018-2038



Sources: Kimley-Horn, 2020; FAA TAF 2018; Woods & Poole Economics, Inc

As shown in **Figure 4-3**, the results of the commercial service type growth rate methodology increase at a higher rate than the population growth rate method but do not indicate as much growth as anticipated by the TAF. Based on the results of the comparison, the **Commercial Service Type Growth Rate Methodology** was selected as the preferred methodology. This methodology was selected because it most accurately depicts the conditions specific to South Dakota and takes into consideration the difference in growth anticipated to occur for the regional carriers versus the mainline carriers. Based on the growth rates associated with the two carrier types, the commercial service airports with mainline carriers (Rapid City and Sioux Falls) are experiencing the highest percentage of growth in their enplanement activity. While Aberdeen, Pierre, and Watertown have service under mainline carrier code shares, their service is operated by regional airlines. Statewide, enplanements are projected to increase by 383,067 over the 20-year forecast period, representing a 1.78 percent annual growth rate through 2038. The population growth rate methodology projected a lower annual growth rate at 1.1 percent and the TAF projected a 2.12 percent annual growth rate.

Table 4-2 documents the results of both enplanement forecast methodologies and shows TAF projections for the five commercial service airports in South Dakota. The preferred methodology is indicated in green in the table, and variances from the TAF are provided for the 5-, 10-, 20- year projections. As shown in the table, variances between the preferred methodology and TAF projections do not exceed FAA thresholds on an airport by airport basis, or statewide.

Table 4-2: Enplanements Forecasts, 2018-2038

Associated City	Airport Name	FAA ID	2018 Baseline Enplanements (TAF)	Commercial Service Type Growth Rate				Population Growth Rate				TAF			
				CAGR 2018-2038	2023	2028	2038	CAGR 2018-2038	2023	2028	2038	CAGR 2018 -2038	2023	2028	2038
Aberdeen	Aberdeen Regional	ABR	28,337	1.60%	30,678	33,212	38,925	0.20%	28,622	28,909	29,492	1.79%	30,945	33,802	40,379
				TAF Variance	-0.87%	-1.78%	-3.74%								
Pierre	Pierre Regional	PIR	33,903	1.60%	36,703	39,735	46,571	0.30%	34,415	34,934	35,996	0.00%	33,903	33,903	33,903
				TAF Variance	7.63%	14.68%	27.20%								
Rapid City	Rapid City Regional	RAP	297,133	1.80%	324,855	355,164	424,528	1.10%	313,839	331,484	369,806	1.41%	315,576	338,159	393,541
				TAF Variance	2.86%	4.79%	7.30%								
Sioux Falls	Sioux Falls Regional/ Joe Foss Field	FSD	530,931	1.80%	580,466	634,623	758,566	1.20%	563,561	598,196	673,982	2.64%	619,280	705,280	893,790
				TAF Variance	-6.69%	-11.13%	-17.83%								
Watertown	Watertown Regional	ATY	12,794	1.60%	13,851	14,995	17,574	0.40%	13,052	13,315	13,857	0.00%	12,794	12,794	12,794
				TAF Variance	7.63%	14.68%	27.20%								
Statewide Totals			**903,098**	**1.78%**	**986,553**	**1,077,729**	**1,286,165**	**1.10%**	**953,487**	**1,006,837**	**1,123,134**	**2.12%**	**1,012,498**	**1,123,938**	**1,374,407**
				Statewide TAF Variance	-2.63%	-4.29%	-6.86%								

Sources: Kimley-Horn, 2020; FAA TAF 2018; Woods & Poole Economics, Inc

4.4.2. Based Aircraft Forecasts

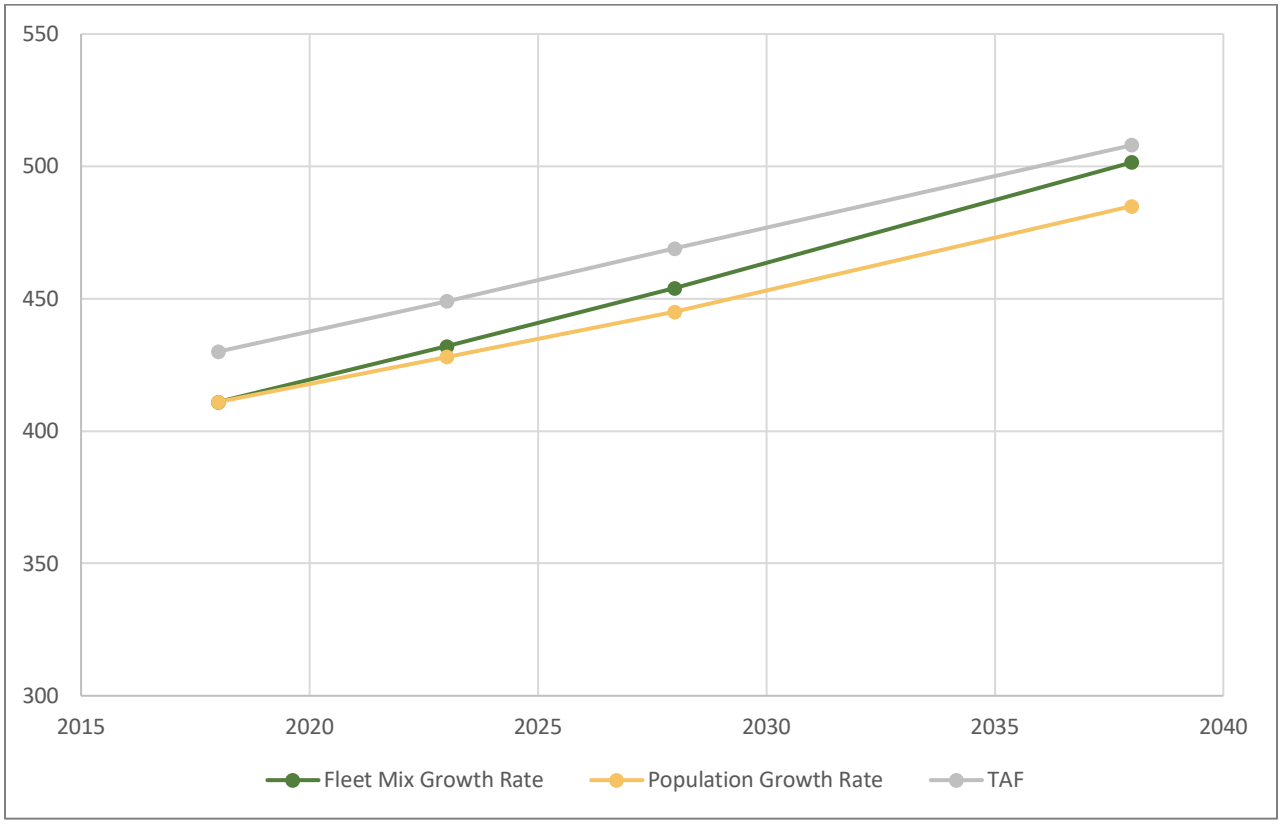
Baseline data for the number of based aircraft at commercial service airports was taken from airport managers' responses to their 2020 SDSASP Inventory Forms. Based aircraft forecasts for 2023, 2028 and 2038 were analyzed using two different methodologies:

- **Population Growth Rate Methodology**: Utilizes South Dakota's projected population growth rates of each county (from Woods & Poole) to the based aircraft counts at the airports residing within that county. The annual growth rate was calculated for the population over the time period the based aircraft were forecasted.
- **Fleet Mix Growth Rate Methodology**: Utilizes each individual airport's based aircraft by type and applies a projected annual growth rate by type using some FAA predictions in the Aerospace Forecast. The following growth rates were utilized to generate future based aircraft:
    - If only single-engine based aircraft exist in the airport's inventory, a 0.2 percent growth rate was applied.
    - If some multi-engine-based aircraft exist in the airport's inventory, a 0.5 percent growth rate was applied.
    - If any jet or turboprop-based aircraft exist in the airport's inventory, a 1.0 percent growth rate was applied.

  The purpose of these specific growth rate percentages is to model the current inventory and reflect a continued predicted share of the market for each aircraft type. This method assumes that the airport's existing inventory responds at the same rates of growth or decline that the national market experiences.

Figure 4-4 demonstrates the results of the two methodologies and the TAF projections for based aircraft at the five commercial service airports.

Figure 4-4: Based Aircraft at Commercial Service Airports Forecasts, 2018-2038



Sources: Kimley-Horn, 2020; FAA TAF 2018; Woods & Poole Economics, Inc

As shown, all three projections are similar in their trajectories of growth, with the fleet mix methodology resulting in a based aircraft increase over the projection period between the TAF and population methodology. The **Fleet Mix Methodology** was selected as the preferred method because it most closely captures the trends of changing aircraft type and based aircraft conditions at South Dakota's commercial service airports. The preferred methodology predicts that based aircraft will increase by 90 aircraft, which is an annual growth rate of 1.00 percent, while the population growth rate methodology yields an expected increase of 74 aircraft at an annual growth rate of 0.83 percent. The TAF projections show an increase of 78 based aircraft at commercial service airports, based on 2018 TAF baseline data. This increase in based aircraft is associated with an annual growth rate of 0.84 percent.

Table 4-3 compares the numbers of based aircraft over the projection period for both methodologies and the TAF projections. The preferred methodology is indicated in green in the table, and variances from the TAF are provided for the 5-, 10-, and 20- year projections. As shown, some notable variances exist for forecasted based aircraft when compared to the TAF, specifically for Aberdeen. This stems from a significant difference in based aircraft counts as reported by the airport for 2018 versus those reported in the TAF for 2018. This initial difference in baseline data creates some significant variances occurring for Aberdeen at the individual airport level. However, when all five commercial service airports are considered, the variance falls well within the thresholds statewide.

Table 4-3: Based Aircraft at Commercial Service Airports Forecasts, 2018-2038

Associated City	Airport Name	FAA ID	2018 Based Aircraft (Airport Reported)	Fleet Mix Growth Rate				Population Growth Rate				TAF				
				CAGR 2018-2038	2023	2028	2038	CAGR 2018-2038	2023	2028	2038	2018 Based Aircraft (TAF)	CAGR 2018-2038	2023	2028	2038
Aberdeen	Aberdeen Regional	ABR	56	1.00%	59	62	68	0.25%	57	57	59	100	0.10%	102	102	102
				TAF Variance	-73.30%	-64.89%	-49.27%									
Pierre	Pierre Regional	PIR	67	1.00%	70	74	82	0.34%	68	69	72	67	0.00%	64	64	64
				TAF Variance	9.11%	13.52%	21.72%									
Rapid City	Rapid City Regional	RAP	125	1.00%	131	138	153	1.09%	132	139	155	119	1.40%	127	137	157
				TAF Variance	3.33%	0.78%	-2.93%									
Sioux Falls	Sioux Falls Regional/ Joe Foss Field	FSD	111	1.00%	117	123	135	1.25%	118	126	142	95	1.70%	104	114	133
				TAF Variance	10.85%	7.02%	1.80%									
Watertown	Watertown Regional	ATY	52	1.00%	55	57	63	0.46%	53	54	57	52	0.00%	52	52	52
				TAF Variance	4.85%	9.47%	18.05%									
Statewide Totals			**411**	**1.00%**	**432**	**454**	**501**	**0.83%**	**428**	**445**	**485**	**430**	**0.84%**	**449**	**469**	**508**
				Statewide TAF Variance	-3.94%	-3.30%	-1.30%									

Sources: Kimley-Horn, 2020; FAA TAF 2018; Woods & Poole Economics, Inc.

4.4.3. Commercial Operations Forecasts

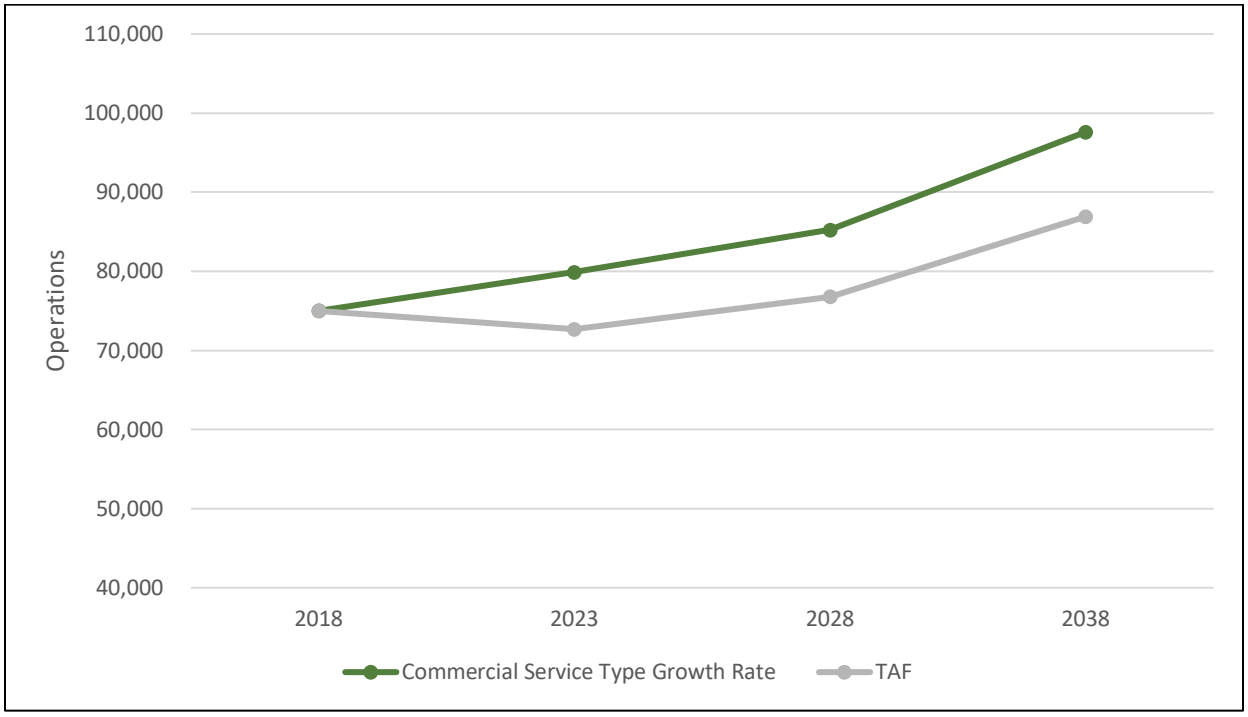
Operations occurring at commercial service airports are important to forecast because it assists in planning for and implementing facility improvements that will support changes in activity levels. The 2018 baseline commercial service operations data was sourced from the 2018 TAF. One methodology was used to forecast commercial service operations in comparison to the TAF projections:

- **Commercial Service Type Growth Rate Methodology:** Applies a projected annual growth rate predicted by the FAA in the *Aerospace Forecast* based on the type of commercial service provided (regional carriers versus mainline carriers). This method anticipates both growth and decline in commercial operations in the next 20 years for South Dakota's airports. The decline is anticipated for commercial airports currently being served by single regional carriers with aircraft with lower seating capacities (-0.3 percent CAGR) as it is expected that the regional carriers will replace their current fleet with larger aircraft, requiring fewer operations. There are other options that may be realized, however at this time, FAA's forecasts show a decline in air taxi/commuter operations and in non-jet regional aircraft, with only a very small growth in regional jet aircraft with more than 40 seats. Comparatively, airports served by mainline air carriers are expected to experience significant growth in operations (1.8 percent) as air travel demand continues to rise.

The purpose of these specific growth rate percentages is to model the operational growth by type of carrier operating. This method assumes that the airport's operations grow or decline at the same rates of growth or decline predicted nationally.

Figure 4-5 presents a comparison of the commercial operations projected using the service type methodology and the projections of commercial operations provided in the TAF.

Figure 4-5: Commercial Service Operations Forecasts, 2018-2038



Sources: Kimley-Horn, 2020; FAA TAF 2018

As shown in **Figure 4-5**, the results of the commercial service type methodology increase more steadily over time and are higher overall than predicted by the TAF. Based on the results of the comparison, the **Commercial Service Type Growth Rate Methodology** was selected as the preferred methodology, projecting an increase of 22,613 commercial operations statewide over the 20-year projection period (a CAGR of 1.33 percent). This methodology was selected as it most accurately depicts the conditions specific to South Dakota and takes into consideration the operational differences expected between regional carriers and mainline carriers. The TAF projects a CAGR of 0.74 percent over 20 years, which is an expected increase of 11,915 commercial service operations. **Table 4-4** shows the results of the preferred methodology and compares it to the TAF projections. The preferred methodology is shown in green, and variances from the TAF are provided for the 5-, 10-, and 20- year projections. As shown, the TAF variance for Rapid City Regional Airport falls outside of the threshold, stemming from the FAA predicting a negative growth rate for the airport in the TAF. This is contrary to the growth predicted by the FAA in the *Aerospace Forecast* for airports similar to Rapid City Regional Airport.

Table 4-4: Commercial Service Operations Forecasts, 2018-2038

Associated City	Airport Name	FAA ID	2018 Commercial Operations (TAF)	Commercial Service Type				TAF			
				CAGR 2018-2038	2023	2028	2038	CAGR 2018-2038	2023	2028	2038
Aberdeen	Aberdeen Regional	ABR	6,692	-0.30%	6,592	6,494	6,302	1.22%	7,098	7,539	8,525
				TAF Variance	-7.67%	-16.09%	-35.28%				
Pierre	Pierre Regional	PIR	11,680	-0.30%	11,506	11,334	10,999	0.00%	11,680	11,680	11,680
				TAF Variance	-1.51%	-3.05%	-6.19%				
Rapid City	Rapid City Regional	RAP	15,755	1.80%	17,225	18,832	22,510	-0.40%	12,345	12,786	14,548
				TAF Variance	28.33%	32.10%	35.37%				
Sioux Falls	Sioux Falls Regional/ Joe Foss Field	FSD	39,653	1.80%	43,353	47,397	56,654	1.26%	40,342	43,550	50,942
				TAF Variance	6.94%	8.12%	10.08%				
Watertown	Watertown Regional	ATY	1,224	-0.30%	1,206	1,188	1,153	0.00%	1,224	1,224	1,224
				TAF Variance	-1.51%	-3.05%	-6.19%				
	Statewide Totals		**75,004**	**1.33%**	**79,881**	**85,245**	**97,617**	**0.74%**	**72,689**	**76,779**	**86,919**
				Statewide TAF Variance	9.00%	9.93%	10.96%				

Sources: Kimley-Horn, 2020; FAA TAF 2018

4.4.4. General Aviation Operations Forecasts

Although commercial service airports mainly support commercial operations, they also accommodate GA operations. These can range from helicopter operations, to recreational and business or corporate operations. Agricultural spraying, natural disaster response, and medical or emergency airlift are amongst other reasons that GA activity exists at commercial service airports. Making projections for these GA activities at commercial service airports is an important step in the overall forecasting process, because the changes expected in these activities impacts the planning and development of commercial service airports. The 2018 GA operations base data from the TAF was used for the following analysis.

Two methodologies were considered for projecting GA operations at commercial service airports:

- **Operations Per Based Aircraft (OPBA) Methodology –** Determines a baseline ratio between the number of GA operations at an airport and the number of based aircraft in the base year (2018). This ratio is then applied to the number of projected based aircraft to generate the forecasted operation estimates. To calculate the OPBA for commercial service airports, based aircraft counts were sourced from the preferred methodology for based aircraft discussed in **Section 4.4.23** (fleet mix methodology). The OPBA ratios generated from this method are shown in **Table 4-5** and represent all GA activity and not just operations conducted by based aircraft.
- **Airport Reference Code (ARC) Methodology –** Utilizes each individual airport's ARC and then applies a projected annual growth rate predicted by the FAA in the *Aerospace Forecast* based on hours flown by aircraft type. Airports with a higher ARC can accommodate larger and more demanding aircraft than those with a smaller ARC. The purpose of the specific growth rates is to model the operational growth by type of aircraft operating. The largest growth is expected at the commercial service airports that have the highest ARCs in the system. This is due to the FAA's prediction of more hours being flown by larger and more demanding aircraft, compared to smaller recreational aircraft. This method assumes that the airport's operations grow or decline at the same rates of growth or decline predicted nationally.

Figure 4-6 compares these two methodologies and the TAF projections for GA operations at commercial service airports.

Figure 4-6: GA Operations at Commercial Service Airports Forecasts, 2018-2038

Sources: Kimley-Horn, 2020; FAA TAF 2018

The OPBA methodology increases at a slightly faster rate than the TAF projections but does not show as extreme of an increase as represented by the ARC methodology. While the ARC methodology is well suited for GA airports, the growth rate applied to the higher ARCs at commercial service airports results in too much of an increase to be considered realistic, or in line with the TAF projections. The **OPBA Methodology** was selected as the preferred methodology to demonstrate anticipated changes to GA operations at South Dakota's five commercial service airports. Based on the selected methodology it is anticipated that GA operations at the five commercial service airports will increase by 27,742, which has an associated growth rate of 1.00 percent annually over the 20-year projection period. The ARC methodology anticipates an additional 68,290 GA operations with an annual growth rate of 2.19 percent, while the TAF projection results in an increase of 16,370 GA operations at commercial service airports, with a growth rate of 0.61 percent over the projection period.

Table 4-5 compares the results of the TAF projections and both methodologies considered for forecasting GA operations at commercial service airports between 2018 and 2038. The table also includes the CAGR associated with each methodology. The preferred methodology is indicated in green in the table, and variances from the TAF are provided for the 5-, 10-, and 20- year projections. GA operations forecasts for all five commercial service airports fall within the TAF variance thresholds previously noted.

Table 4-5: GA Operations at Commercial Service Airports Forecasts, 2018-2038

Associated City	Airport Name	FAA ID	ARC	2018 GA Operations (TAF)	2018 Based Aircraft	OPBA	OPBA Methodology				ARC Methodology				TAF			
							CAGR 2018-2038	2023	2028	2038	CAGR 2018-2038	2023	2028	2038	CAGR 2018-2038	2023	2028	2038
Aberdeen	Aberdeen Regional	ABR	C-II	33,990	56	607	1.00%	35,724	37,546	41,474	1.80%	37,161	40,628	48,563	1.52%	36,664	39,546	45,961
							TAF Variance	-2.63%	-5.33%	-10.82%								
Pierre	Pierre Regional	PIR	C-II	22,500	67	336	1.00%	23,648	24,854	27,454	1.80%	24,599	26,894	32,147	0.00%	22,500	22,500	22,500
							TAF Variance	4.85%	9.47%	18.05%								
Rapid City	Rapid City Regional	RAP	C-III	28,985	125	232	1.00%	30,464	32,017	35,367	2.40%	32,634	36,743	46,577	0.19%	28,738	29,172	30,077
							TAF Variance	5.66%	8.89%	14.96%								
Sioux Falls	Sioux Falls Regional/Joe Foss Field	FSD	D-IV	29,518	111	266	1.00%	31,024	32,606	36,018	2.80%	33,889	38,906	51,280	0.53%	30,353	31,155	32,825
							TAF Variance	2.16%	4.45%	8.86%								
Watertown	Watertown Regional	ATY	C-II	11,000	52	212	1.00%	11,561	12,151	13,422	1.80%	12,026	13,148	15,716	0.00%	11,000	11,000	11,000
							TAF Variance	4.85%	9.47%	18.05%								
	Statewide Totals			**125,993**	**411**	**307**	**1.00%**	**132,420**	**139,175**	**153,735**	**2.19%**	140,309	156,320	194,283	**0.61%**	129,255	133,373	142,363
							Statewide TAF Variance	2.39%	4.17%	7.40%								

Sources: Kimley-Horn, 2020; FAA TAF 2018

4.4.5. Military Operations

Some commercial service airports facilitate operations that are performed by military aircraft. Military activity in South Dakota's aviation system spans from military operations conducted at Sioux Falls Regional Airport due to its collocation with South Dakota Air National Guard to itinerant military operations executed at GA and commercial service airports. South Dakota's commercial service airports facilitated almost 5,000 military operations in 2018 according to the TAF, while airport reported military operations were closer to 6,500. According to the TAF, of four of the five commercial service airports facilitated military operations.

The future of military operations is oftentimes difficult to ascertain as this information is dependent on national security needs. As these needs cannot be easily predicted, forecasts for future military operations are held at a constant rate into the planning horizon. Therefore, military operations are anticipated to remain flat through 2038.

Table 4-6 shows the military operations for 2018 as reported in the TAF and as reported by airports. In some cases, the operation counts vary significantly. Sioux Falls Regional Airport handled the largest number of military operations according to the TAF and inventory reported data, handling 2,503 and 3,184 respectively.

Table 4-6: 2018 Military Operations by Source

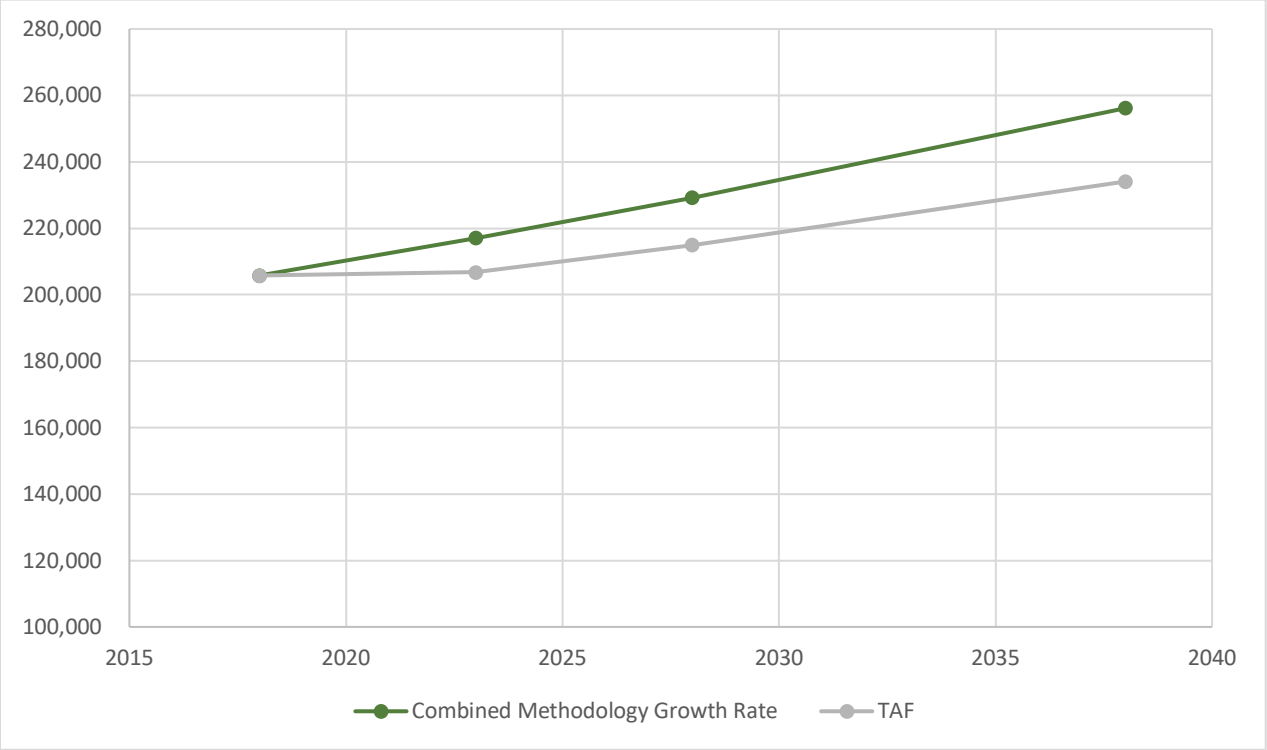
Associated City	Airport Name	FAA ID	2018 Military Operations (TAF)	2018 Military Operations (Airport Reported)
Commercial Service				
Aberdeen	Aberdeen Regional	ABR	60	0
Pierre	Pierre Regional	PIR	500	720
Rapid City	Rapid City Regional	RAP	1,736	2,569
Sioux Falls	Joe Foss Field	FSD	2,503	3,184
Watertown	Watertown Regional	ATY	0	0
		Statewide Totals	**4,799**	**6,473**

Sources: Kimley-Horn, 2020; FAA TAF 2018

4.4.6. Total Operations at Commercial Service Airports

This section summarizes all operations at the five commercial service airports in the system. The findings for commercial operations, GA operations, and military operations were summed to provide the total projected values for all operations at commercial service airports. The combined results of the commercial service, GA, and military operations were compared with the TAF forecast for total operations. **Figure 4-7** illustrates the difference between these combined preferred methodologies (one for commercial operations, one for GA operations, and the flat-lined military operations) and the TAF. The difference in growth is expected since the preferred methodology for both commercial and GA operations is higher than the TAF.

Figure 4-7: Total Operations at Commercial Service Airports Forecasts, 2018-2038



Sources: Kimley-Horn, 2020; FAA TAF 2018

Table 4-7 shows the results of the total operations at the five commercial service airports for each forecast year. The combined methodology results in an increase of 50,176 operations (annual growth rate of 1.10 percent) over the 20-year forecast period, while the TAF projection estimates an increase of 28,285 operations, with an annual growth rate of 0.65 percent. Sioux Falls Regional is expected to see the largest increase in total operations compared to the other four commercial service airports in the SDSASP, with an estimated 23,501 more operations expected by 2038. The table also shows TAF variance for 5-, 10-, and 20-year projections.

Table 4-7: Total Operations at Commercial Service Airports Forecasts, 2018-2038

Associated City	Airport Name	FAA ID	2018 Commercial, GA, Military Operations (TAF)	Combined Methodology				TAF			
				CAGR 2018 -2038	2023	2028	2038	CAGR 2018 –2038	2023	2028	2038
Aberdeen	Aberdeen Regional	ABR	40,742	0.81%	42,376	44,100	47,836	1.46%	43,822	47,145	54,546
				TAF Variance	-3.41%	-6.90%	-14.03%				
Pierre	Pierre Regional	PIR	34,680	0.56%	35,654	36,688	38,953	0.00%	34,680	34,680	34,680
				TAF Variance	2.73%	5.47%	10.97%				
Rapid City	Rapid City Regional	RAP	46,476	1.25%	49,424	52,585	59,613	-0.01%	42,819	43,694	46,361
				TAF Variance	13.36%	16.91%	22.23%				
Sioux Falls	Sioux Falls Regional/ Joe Foss Field	FSD	71,674	1.43%	76,879	82,507	95,175	0.96%	73,198	77,208	86,270
				TAF Variance	4.79%	6.42%	9.36%				
Watertown	Watertown Regional	ATY	12,224	0.88%	12,767	13,339	14,575	0.00%	12,224	12,224	12,224
				TAF Variance	4.25%	8.36%	16.13%				
	Statewide Totals		**205,796**	**1.10%**	**217,100**	**229,219**	**256,152**	**0.65%**	**206,743**	**214,951**	**234,081**
				Statewide TAF Variance	4.77%	6.22%	8.62%				

Sources: Kimley-Horn, 2020; FAA TAF 2018

4.5. General Aviation Activity

This section focuses on the projected activity levels expected at GA airports in South Dakota's aviation system. Two components are analyzed for GA airports – based aircraft and operations. Historic and current conditions at GA airports provide insights to trends unique to the GA airports in South Dakota. Analysis of overall GA activity assists in the identification of indicators that will influence aviation activity in the future. The analyses in this section relied on FAA TAF data, basedaircraft.com data, and data sourced from the 2020 SDSASP Inventory Form. Since 2018 serves as the base year for calculations, projections are provided for years 2023, 2028, and 2038.

4.5.1. Based Aircraft Forecasts

Based aircraft inventories were gathered from numerous sources and compared against one another to attain the most accurate counts of aircraft currently based at GA airports. Based on findings and discussions with the FAA, it was determined that the based aircraft counts validated on basedaircraft.com would be used as the base data for projections. Data on basedaircraft.com is collected by the FAA through the National Based Aircraft Inventory Program and is verified for all Nonprimary airports in the National Plan of Integrated Airport Systems (NPIAS). The FAA uses these numbers to determine NPIAS eligibility, allocate appropriate federal funding, and to determine system-wide improvements.

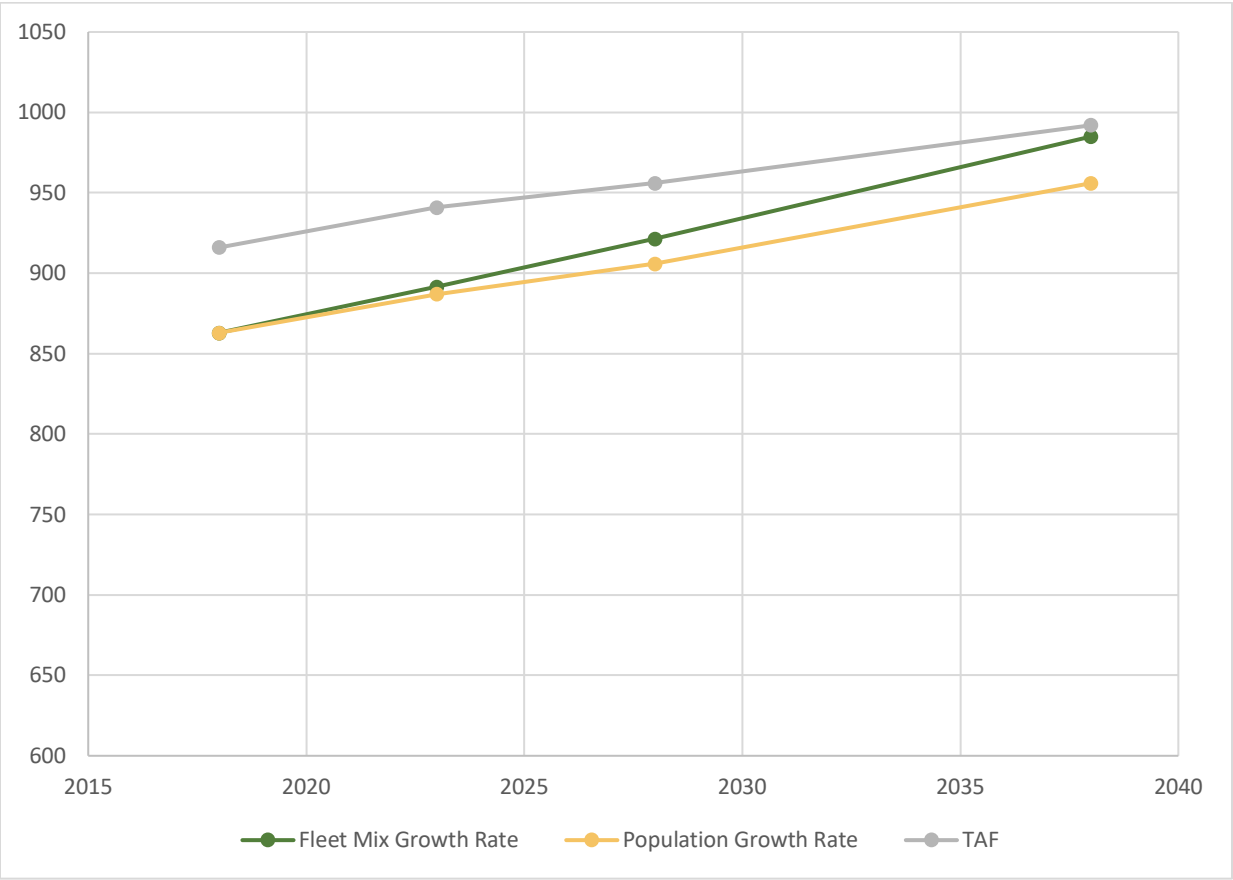
Two methodologies were used to project based aircraft counts at GA airports in South Dakota's aviation system:

- **Population Growth Rate Methodology:** Utilizes South Dakota's projected population growth rates of each county (from Woods & Poole) to the based aircraft counts at the airports residing within that county. The annual growth rate was calculated for the population over the time period the based aircraft were forecasted.
- **Fleet Mix Growth Rate Methodology:** Utilizes each individual airport's inventory-reported 2018 based aircraft by type and then applies a projected annual growth rate (predicted in part by the FAA via the *Aerospace Forecast*) based on the type of aircraft. The following growth rates were utilized to generate future based aircraft projections:
    - If an airport reported only single-engine based aircraft, a 0.2 percent growth rate was applied.
    - If an airport reported some multi-engine-based aircraft, a 0.5 percent growth rate was applied.
    - If an airport reported any jet or turboprop-based aircraft, a 1.0 percent growth rate was applied.

The purpose of these specific growth rate percentages is to model the current inventory and reflect a continued predicted share of the market for each aircraft type. This method assumes that the airport's existing inventory responds at the same rates of growth or decline that the national market experiences.

Figure 4-8 shows the growth trajectories resulting from both methodologies and TAF projections.

Figure 4-8: Based Aircraft at GA Airports Forecasts, 2018-2038



Sources: Kimley-Horn 2020; FAA TAF 2018

As shown, the TAF methodology is predicting the largest number of based aircraft, followed by the fleet mix and population growth rate methodologies. The preferred methodology for based aircraft is the **Fleet Mix Methodology**. This methodology's results show modest growth, falling between the results from the population growth rate methodology and the TAF projections, but most importantly, the fleet mix methodology is specifically tailored to the conditions at GA airports in South Dakota, aligning growth rates by aircraft type. The preferred fleet mix methodology shows a projected increase of 122 additional based aircraft across South Dakota's system of GA airports, totaling 985 based aircraft by 2038, corresponding to an annual growth rate of 0.66 percent. The population growth rate method projects an increase of 93 based aircraft (annual growth rate of 0.51 percent) and the TAF projects the addition of 76 aircraft at GA airports, showing an annual growth rate of 0.40 percent, according to TAF baseline data.

Table 4-8 shows the results of both based aircraft forecast methodologies and TAF projections for GA airports in the South Dakota system over the planning period. The preferred methodology is indicated in green in the table, and variances from the TAF are provided for the 5-, 10-, and 20-year projections. The variance between projected based aircraft and the TAF exceeds thresholds for some airports. This stems from a difference in the number of based aircraft reported by airports for 2018 and the based aircraft counts from the TAF. This initial discrepancy in baseline data creates some significant variances occurring at the individual airport level. However, when all GA airports are considered, the variance falls well within the thresholds statewide.

Table 4-8: Based Aircraft at GA Airports Forecasts, 2018-2038

Associated City	Airport Name	FAA ID	2018 Based Aircraft (Nat'l Based Aircraft Inventory)	Fleet Mix Methodology				Population Growth Rate Methodology				TAF				
				CAGR 2018-2038	2023	2028	2038	CAGR 2018-2038	2023	2028	2038	2018 Based Aircraft (TAF)	CAGR 2018-2038	2023	2028	2038
Belle Fourche	Belle Fourche Municipal	EFC	21	0.50%	22	22	23	0.50%	22	22	23	25	0.20%	26	26	26
				TAF Variance	-20.76%	-17.79%	-12.06%									
Bison	Bison Municipal	6V5	8	0.20%	8	8	8	-0.50%	8	8	7	7	0.00%	7	7	7
				TAF Variance	13.37%	14.23%	15.93%									
Britton	Britton Municipal	BTN	6	0.20%	6	6	6	-0.03%	6	6	6	9	0.00%	9	9	9
				TAF Variance	-48.51%	-47.03%	-44.12%									
Brookings	Brookings Regional	BKX	45	1.00%	47	50	55	0.81%	47	49	53	47	0.00%	47	47	47
				TAF Variance	0.62%	5.45%	14.40%									
Buffalo	Harding County	9D2	4	0.50%	4	4	4	-0.48%	4	4	4	5	0.00%	5	5	5
				TAF Variance	-21.92%	-18.92%	-13.13%									
Canton	Canton Municipal	7G9	16	1.00%	17	18	20	2.39%	18	20	26	14	0.00%	14	14	14
				TAF Variance	16.75%	20.79%	28.29%									
Chamberlain	Chamberlain Municipal	9V9	16	0.20%	16	16	17	-0.14%	16	16	16	21	0.00%	21	21	21
				TAF Variance	-29.95%	-28.65%	-26.11%									
Clark	Clark County	8D7	22	1.00%	23	24	27	-0.51%	21	21	20	22	0.00%	22	22	22
				TAF Variance	4.85%	9.47%	18.05%									
Custer	Custer County	CUT	16	0.20%	16	16	17	0.85%	17	17	19	14	0.00%	14	14	14
				TAF Variance	13.37%	14.23%	15.93%									
De Smet	Wilder	6E5	9	0.20%	9	9	9	-0.48%	9	9	8	13	0.00%	13	13	13
				TAF Variance	-43.01%	-41.59%	-38.79%									
Eagle Butte	Cheyenne Eagle Butte	84D	2	0.20%	2	2	2	0.29%	2	2	2	3	0.00%	3	3	3
				TAF Variance	-48.51%	-47.03%	-44.12%									
Edgemont	Edgemont Municipal	6V0	5	0.20%	5	5	5	-0.10%	5	5	5	7	0.00%	7	7	7
				TAF Variance	-38.61%	-37.23%	-34.52%									
Eureka	Eureka Municipal	3W8	4	0.20%	4	4	4	-0.27%	4	4	4	3	0.00%	3	3	3
				TAF Variance	25.75%	26.48%	27.94%									
Faith	Faith Municipal	D07	7	0.20%	7	7	7	1.10%	7	8	9	5	0.00%	5	5	5
				TAF Variance	29.28%	29.98%	31.37%									
Faulkton	Faulkton Municipal	3FU	16	0.50%	16	17	18	-0.09%	16	16	16	18	0.00%	18	18	18
				TAF Variance	-9.73%	-7.03%	-1.82%									
Flandreau	Flandreau Municipal	4P3	12	0.20%	12	12	12	-0.24%	12	12	11	12	0.00%	12	12	12

Associated City	Airport Name	FAA ID	2018 Based Aircraft (Nat'l Based Aircraft Inventory)	Fleet Mix Methodology				Population Growth Rate Methodology				TAF				
				CAGR 2018-2038	2023	2028	2038	CAGR 2018-2038	2023	2028	2038	2018 Based Aircraft (TAF)	CAGR 2018-2038	2023	2028	2038
				TAF Variance	0.99%	1.98%	3.92%									
Gettysburg	Gettysburg Municipal	0D8	12	0.20%	12	12	12	-0.15%	12	12	12	15	0.00%	15	15	15
				TAF Variance	-23.76%	-22.53%	-20.10%									
Gregory	Gregory Municipal-Flynn Field	9D1	11	0.50%	11	12	12	-0.35%	11	11	10	9	0.00%	9	9	9
				TAF Variance	20.20%	22.16%	25.95%									
Highmore	Highmore Municipal	9D0	12	1.00%	13	13	15	-0.67%	12	11	10	12	0.00%	12	12	12
				TAF Variance	4.85%	9.47%	18.05%									
Hot Springs	Hot Springs Municipal	HSR	23	1.00%	24	25	28	-0.10%	23	23	23	30	0.00%	30	30	30
				TAF Variance	-24.10%	-18.08%	-6.90%									
Hoven	Hoven Municipal	9F8	8	0.20%	8	8	8	-0.13%	8	8	8	9	0.00%	9	9	9
				TAF Variance	-11.38%	-10.27%	-8.09%									
Howard	Howard Municipal	8D9	6	0.20%	6	6	6	-0.76%	6	6	5	6	0.00%	6	6	6
				TAF Variance	0.99%	1.98%	3.92%									
Huron	Huron Regional	HON	26	1.00%	27	29	32	-0.19%	26	26	25	24	0.00%	24	24	24
				TAF Variance	12.17%	16.44%	24.35%									
Lemmon	Lemmon Municipal	LEM	11	0.20%	11	11	11	-0.50%	11	10	10	12	0.00%	12	12	12
				TAF Variance	-8.01%	-6.93%	-4.82%									
Madison	Madison Municipal	MDS	70	0.50%	72	74	77	0.12%	70	71	72	64	-0.08%	65	65	65
				TAF Variance	9.43%	11.66%	15.96%									
Martin	Martin Municipal	9V6	5	0.20%	5	5	5	0.23%	5	5	5	6	0.00%	6	6	6
				TAF Variance	-18.81%	-17.63%	-15.30%									
McLaughlin	Mc Laughlin Municipal	5P2	10	0.20%	10	10	10	0.23%	10	10	10	10	0.00%	10	10	10
				TAF Variance	0.99%	1.98%	3.92%									
Milbank	Milbank Municipal	1D1	9	0.20%	9	9	9	-0.34%	9	9	8	13	0.00%	13	13	13
				TAF Variance	-43%	-42%	-39%									
Miller	Miller Municipal	MKA	10	1.00%	11	11	12	-0.66%	10	9	9	10	0.00%	10	10	10
				TAF Variance	4.85%	9.47%	18.05%									
Mitchell	Mitchell Municipal	MHE	31	1.00%	33	34	38	0.38%	32	32	33	31	0.00%	31	31	31
				TAF Variance	4.85%	9.47%	18.05%									
Mobridge	Mobridge Municipal	MBG	18	0.50%	18	19	20	-0.13%	18	18	18	18	0.00%	18	18	18
				TAF Variance	2.46%	4.87%	9.49%									

Associated City	Airport Name	FAA ID	2018 Based Aircraft (Nat'l Based Aircraft Inventory)	Fleet Mix Methodology				Population Growth Rate Methodology				TAF				
				CAGR 2018-2038	2023	2028	2038	CAGR 2018-2038	2023	2028	2038	2018 Based Aircraft (TAF)	CAGR 2018-2038	2023	2028	2038
Murdo	Murdo Municipal	8F6	1	0.20%	1	1	1	-0.79%	1	1	1	1	0.00%	1	1	1
				TAF Variance	0.99%	1.98%	3.92%									
Onida	Onida Municipal	98D	17	0.20%	17	17	18	-0.61%	16	16	15	20	0.00%	20	20	20
				TAF Variance	-16.48%	-15.32%	-13.04%									
Parkston	Parkston Municipal	8V3	11	0.20%	11	11	11	-0.44%	11	11	10	11	0.00%	11	11	11
				TAF Variance	0.99%	1.98%	3.92%									
Philip	Philip	PHP	13	0.20%	13	13	14	-0.30%	13	13	12	14	3.53%	28	28	28
				TAF Variance	-113.24%	-111.12%	-106.95%									
Pine Ridge	Pine Ridge	IEN	0	0.20%	0	0	0	0.66%	0	0	0	0	0.00%	0	0	0
				TAF Variance	0.00%	0.00%	0.00%									
Platte	Platte Municipal	1D3	15	1.00%	16	17	18	0.14%	15	15	15	15	0.00%	15	15	15
				TAF Variance	4.85%	9.47%	18.05%									
Redfield	Redfield Municipal	1D8	11	0.50%	11	12	12	-0.16%	11	11	11	18	0.00%	18	18	18
				TAF Variance	-59.61%	-55.68%	-48.10%									
Rosebud	Rosebud Sioux Tribal	SUO	0	0.20%	0	0	0	0.52%	0	0	0	0	0.00%	0	0	0
				TAF Variance	0%	0%	0%									
Sisseton	Sisseton Municipal	8D3	10	0.20%	10	10	10	0.39%	10	10	11	10	0.00%	10	10	10
				TAF Variance	0.99%	1.98%	3.92%									
Spearfish	Black Hills-Clyde Ice Field	SPF	70	1.00%	74	77	85	1.00%	74	77	85	75	0.00%	75	75	75
				TAF Variance	-1.94%	3.00%	12.19%									
Springfield	Springfield Municipal	Y03	10	0.20%	10	10	10	-0.30%	10	10	9	9	0.00%	9	9	9
				TAF Variance	11%	12%	14%									
Sturgis	Sturgis Municipal	49B	47	0.50%	48	49	52	1.10%	50	52	59	51	0.00%	51	51	51
				TAF Variance	10.89%	11.78%	13.53%									
Tea	Marv Skie-Lincoln County	Y14	80	1.00%	84	88	98	2.39%	90	101	128	91	2.07%	101	111	137
				TAF Variance	-20%	-26%	-40%									
Vermillion	Harold Davidson Field	VMR	23	1.00%	24	25	28	0.14%	23	23	24	26	1.92%	23	28	38
				TAF Variance	-5.84%	-3.23%	1.79%									
Wagner	Wagner Municipal	AGZ	13	0.50%	13	14	14	0.14%	13	13	13	9	0.00%	9	9	9
				TAF Variance	-20.12%	-25.61%	-40.35%									

Associated City	Airport Name	FAA ID	2018 Based Aircraft (Nat'l Based Aircraft Inventory)	Fleet Mix Methodology				Population Growth Rate Methodology				TAF				
				CAGR 2018-2038	2023	2028	2038	CAGR 2018-2038	2023	2028	2038	2018 Based Aircraft (TAF)	CAGR 2018-2038	2023	2028	2038
Wall	Wall Municipal	6V4	13	0.20%	13	13	14	1.09%	14	14	16	13	0.00%	13	13	13
				TAF Variance	0.99%	1.98%	3.92%									
Webster	The Sigurd Anderson	1D7	4	0.20%	4	4	4	-0.55%	4	4	4	4	0.00%	4	4	4
				TAF Variance	0.99%	1.98%	3.92%									
Wessington Springs	Wessington Springs	4X4	4	0.50%	4	4	4	-0.60%	4	4	4	4	0.00%	4	4	4
				TAF Variance	2.46%	4.87%	9.49%									
Winner	Winner Regional	ICR	16	0.20%	16	16	17	-0.28%	16	16	15	13	0.72%	15	15	15
				TAF Variance	7.18%	8.10%	9.92%									
Yankton	Chan Gurney Municipal	YKN	34	1.00%	36	38	41	0.37%	35	35	37	38	0.00%	38	38	38
				TAF Variance	-6.34%	-1.18%	8.40%									
		Statewide Totals	**863**	**0.66%**	**892**	**921**	**985**	**0.51%**	**887**	**906**	**956**	**916**	**0.40%**	**941**	**956**	**992**
				Statewide TAF Variance	-5.54%	-3.75%	-0.71%									

Sources: Kimley-Horn, 2020; FAA TAF 2018; Woods & Poole Economics, Inc

4.5.2. GA Operations Forecasts

Estimates of GA operations for GA system airports were gathered from multiple sources and compared to obtain the most realistic operation counts possible. GA operations are inherently difficult to forecast as base data is a best guess for any airport that does not have an air traffic control tower. Consulting with the FAA, the 2018 GA operations counts from the 2020 SDSASP Inventory Form were used as the base data for this analysis.

Two methodologies were considered when selecting the most realistic forecasts of GA operations at GA system airports:

- **Operations Per Based Aircraft (OPBA) Methodology –** Determines a baseline ratio between the number of GA operations at an airport and the number of based aircraft in the base year (2018). This ratio is then applied to the number of projected based aircraft to generate the forecasted operation estimates. To calculate the OPBA for GA airports, based aircraft counts were sourced from the preferred methodology for based aircraft discussed in the previous section (fleet mix methodology). The OPBA ratio generated from this method represents all GA activity and not just operations conducted by based aircraft.
- **Airport Reference Code (ARC) Methodology –** Utilizes each individual airport's ARC and then applies a projected annual growth rate predicted by the FAA in the *Aerospace Forecast* based on hours flown by aircraft type. Airports with a higher ARC can accommodate larger and more demanding aircraft than those with a smaller ARC. The purpose of the specific growth rates is to model the operational growth by type of aircraft operating at the airport. For GA airports with lower ARCs, the least growth is expected as the type of aircraft accommodated by these facilities is predicted to decrease in numbers at the national level over the forecast period.

Figure 4-9 demonstrates the projected increase in GA operations at South Dakota GA airports for both methodologies and the TAF projections.

Figure 4-9: GA Operations at GA Airports Forecasts, 2018-2038

Sources: Kimley-Horn, 2020; FAA TAF 2018

As the figure shows, all three projections increase at a comparable rate, until after 2028 and the ARC methodology shows the greatest increase in GA operations over the 20-year projection period. The preferred methodology selected was the **ARC Methodology**. The preferred methodology results in a projected increase of 33,430 operations at GA airports over the 20-year forecast period, which results in a CAGR of 0.61 percent. The population growth rate method resulted in an anticipated increase of 33,834 operations with annual growth rate of 0.65 percent. The TAF projections shows an increase of 4,182 operations at GA airports in the South Dakota system, which corresponds to a growth rate of 0.08 percent, when using TAF 2018 baseline data.

Table 4-9 shows the results of each forecast methodology and the TAF projections for operations at each GA airport in the system. It is important to note that two airports in the table below indicate an N/A result for the OPBA methodology (Pine Ridge and Rosebud) and that is because these airports reported zero based aircraft, and therefore the OPBA ratio could not be calculated and no forecast was prepared for these airports using this methodology. The preferred methodology is indicated in green in the table, and variances from the TAF are provided for the 5-, 10-, and 20- year projections. The variance between projected GA operations and the TAF exceeds thresholds for some airports. This stems from a difference in the number of GA operations reported by airports for 2018 and the GA operation counts from the TAF. This initial discrepancy in baseline data creates some significant variances occurring at the individual airport level. However, when all GA airports are considered, the variance falls well within the thresholds statewide.

Table 4-9: Operations at GA Airports Forecasts, 2018-2038

Associated City	Airport Name	FAA ID	ARC	2018 GA Operations (Airport Reported)	ARC Methodology				OPBA Methodology						TAF				
					CAGR 2018-2038	2023	2028	2038	2018 Based Aircraft	OPBA	CAGR 2018-2038	2023	2028	2038	2018 GA Operations (TAF)	CAGR 2018-2038	2023	2028	2038
Belle Fourche	Belle Fourche Municipal	EFC	B-I	1,638	0.10%	1,646	1,654	1,671	21	78	0.50%	1,679	1,722	1,810	4,200	0.00%	4,200	4,200	4,200
					TAF Variance	-155%	-154%	-151%											
Bison	Bison Municipal	6V5	A/B-I	2,280	0.10%	2,291	2,303	2,326	8	285	0.20%	2,303	2,326	2,373	2,280	0.00%	2,280	2,280	2,280
					TAF Variance	0.50%	0.99%	1.98%											
Britton	Britton Municipal	BTN	B-I	2,740	0.10%	2,754	2,768	2,795	6	457	0.20%	2,768	2,795	2,852	2,740	0.00%	2,740	2,740	2,740
					TAF Variance	0.50%	0.99%	1.98%											
Brookings	Brookings Regional	BKX	C-IV	47,400	2.40%	49,818	52,359	57,837	45	1,053	1.00%	49,818	52,359	57,837	31,305	-0.10%	30,655	30,655	30,655
					TAF Variance	38.47%	41.45%	47.00%											
Buffalo	Harding County	9D2	B-I	750	0.10%	769	788	829	4	188	0.50%	769	788	829	1,020	0.00%	1,020	1,020	1,020
					TAF Variance	-32.65%	-29.38%	-23.09%											
Canton	Canton Municipal	7G9	B-I	3,800	0.10%	3,994	4,198	4,637	16	238	1.00%	3,994	4,198	4,637	1,700	0.00%	1,700	1,700	1,700
					TAF Variance	57.43%	59.50%	63.34%											
Chamberlain	Chamberlain Municipal	9V9	B-II	7,506	0.40%	7,506	7,657	7,812	16	469	0.20%	7,581	7,657	7,812	7,506	0.00%	7,500	7,500	7,500
					TAF Variance	0.08%	2.05%	3.99%											
Clark	Clark County	8D7	A/B-I	3,200	0.10%	3,363	3,535	3,905	22	145	1.00%	3,363	3,535	3,905	3,200	-0.01%	3,196	3,196	3,196
					TAF Variance	4.97%	9.58%	18.15%											
Custer	Custer County	CUT	A/B-I	5,860	0.10%	5,860	5,889	5,919	16	366	0.20%	5,919	5,978	6,099	3,648	0.52%	3,748	3,848	4,046
					TAF Variance	36.04%	34.66%	31.64%											
De Smet	Wilder	6E5	A/B-I	40	0.10%	40	40	40	9	4	0.20%	40	41	42	1,680	0.00%	1,680	1,680	1,680
					TAF Variance	-4100.00%	-4079.06%	-4058.23%											
Eagle Butte	Cheyenne Eagle Butte	84D	B-I	2,248	0.10%	2,248	2,259	2,271	2	1,124	0.20%	2,271	2,293	2,340	2,248	0.00%	2,248	2,248	2,248
					TAF Variance	0.00%	0.50%	0.99%											
Edgemont	Edgemont Municipal	6V0	A-I	208	0.10%	208	209	210	5	42	0.20%	210	212	216	208	0.00%	208	208	208
					TAF Variance	0.00%	0.50%	0.99%											
Eureka	Eureka Municipal	3W8	A-I	580	0.10%	586	592	604	4	145	0.20%	586	592	604	580	0.00%	580	580	580
					TAF Variance	0.99%	1.98%	3.92%											
Faith	Faith Municipal	D07	A/B-I	1,280	0.10%	1,286	1,293	1,306	7	183	0.20%	1,293	1,306	1,332	1,280	0.00%	1,280	1,280	1,280

Associated City	Airport Name	FAA ID	ARC	2018 GA Operations (Airport Reported)	ARC Methodology				OPBA Methodology						TAF				
					CAGR 2018-2038	2023	2028	2038	2018 Based Aircraft	OPBA	CAGR 2018-2038	2023	2028	2038	2018 GA Operations (TAF)	CAGR 2018-2038	2023	2028	2038
					TAF Variance	0.50%	0.99%	1.98%											
Faulkton	Faulkton Municipal	3FU	A/B-II	3,560	0.40%	3,632	3,705	3,856	16	223	0.50%	3,650	3,742	3,933	3,560	0.00%	3,560	3,560	3,560
					TAF Variance	1.98%	3.91%	7.67%											
Flandreau	Flandreau Municipal	4P3	A/B-I	3,478	0.10%	3,495	3,513	3,548	12	290	0.20%	3,513	3,548	3,620	3,440	0.00%	3,440	3,440	3,440
					TAF Variance	1.59%	2.08%	3.05%											
Gettysburg	Gettysburg Municipal	0D8	B-II	,5600	0.40%	5,713	5,828	6,065	12	467	0.20%	5,656	5,713	5,828	8,754	0.91%	9,155	9,577	10,484
					TAF Variance	-60.25%	-64.33%	-72.85%											
Gregory	Gregory Municipal-Flynn Field	9D1	A/B-I	4,320	0.10%	4,342	4,363	4,407	11	393	0.50%	4,429	4,541	4,773	2,712	-0.02%	2,700	2,700	2,700
					TAF Variance	37.81%	38.12%	38.74%											
Highmore	Highmore Municipal	9D0	B-II	17	0.40%	17	18	18	12	1	1.00%	18	19	21	5,620	0.00%	5,620	5,620	5,620
					TAF Variance	-32305.51%	-31665.10%	-30422.01%											
Hot Springs	Hot Springs Municipal	HSR	B-II	2,867	0.40%	2,925	2,984	3,105	23	125	1.00%	3,013	3,167	3,498	6,764	0.53%	7,012	7,221	7,524
					TAF Variance	-139.74%	-142.01%	-142.30%											
Hoven	Hoven Municipal	9F8	A/B-I	1,520	0.10%	1,528	1,535	1,551	8	190	0.20%	1,535	1,551	1,582	1,520	0.00%	1,520	1,520	1,520
					TAF Variance	0.50%	0.99%	1.98%											
Howard	Howard Municipal	8D9	A-I	720	0.10%	724	727	735	6	120	0.20%	727	735	749	720	0.00%	720	720	720
					TAF Variance	0.50%	0.99%	1.98%											
Huron	Huron Regional	HON	C-II	11,200	1.80%	12,245	13,387	16,002	26	431	1.00%	11,771	12,372	13,666	13,252	-0.49%	12,000	12,000	12,000
					TAF Variance	2.00%	10.36%	25.01%											
Lemmon	Lemmon Municipal	LEM	B-II	890	0.40%	908	926	964	11	81	0.20%	899	908	926	4,820	0.00%	4,820	4,820	4,820
					TAF Variance	-430.87%	-420.38%	-400.01%											
Madison	Madison Municipal	MDS	B-II	14,960	0.40%	15,262	15,569	16,203	70	214	0.50%	15,338	15,725	16,529	14,960	-0.02%	14,900	14,900	14,900
					TAF Variance	2.37%	4.30%	8.04%											
Martin	Martin Municipal	9V6	B-II	1,540	0.40%	1,571	1,603	1,668	5	308	0.20%	1,555	1,571	1,603	348	0.00%	348	348	348
					TAF Variance	77.85%	78.29%	79.14%											
McLaughlin	Mc Laughlin Municipal	5P2	A/B-I	130	0.10%	131	131	133	10	13	0.20%	131	133	135	636	0.00%	636	636	636

Associated City	Airport Name	FAA ID	ARC	2018 GA Operations (Airport Reported)	ARC Methodology				OPBA Methodology						TAF				
					CAGR 2018-2038	2023	2028	2038	2018 Based Aircraft	OPBA	CAGR 2018-2038	2023	2028	2038	2018 GA Operations (TAF)	CAGR 2018-2038	2023	2028	2038
					TAF Variance	-386.79%	-384.37%	-379.55%											
Milbank	Milbank Municipal	1D1	A/B-I	4,440	0.10%	4,462	4,485	4,530	9	493	0.20%	4,485	4,530	4,621	4,440	0.00%	4,440	4,440	4,440
					TAF Variance	0.50%	0.99%	1.98%											
Miller	Miller Municipal	MKA	A/B-I	6,100	0.10%	6,131	6,161	6,223	10	610	1.00%	6,411	6,738	7,443	6,100	0.00%	6,100	6,100	6,100
					TAF Variance	0.50%	0.99%	1.98%											
Mitchell	Mitchell Municipal	MHE	C-III	14,880	2.40%	16,753	18,863	23,911	31	480	1.00%	15,639	16,437	18,156	14,880	-0.20%	14,300	14,300	14,300
					TAF Variance	14.64%	24.19%	40.20%											
Mobridge	Mobridge Municipal	MBG	A/B-II	375	0.40%	383	390	406	18	21	0.50%	384	394	414	5,524	-0.02%	5,500	5,500	5,500
					TAF Variance	-1337.68%	-1309.27%	-1254.12%											
Murdo	Murdo Municipal	8F6	A/B-I	400	0.10%	402	404	408	1	400	0.20%	404	408	416	400	0.00%	400	400	400
					TAF Variance	0.50%	0.99%	1.98%											
Onida	Onida Municipal	98D	A/B-I	5,500	0.10%	5,528	5,555	5,611	17	324	0.20%	5,555	5,611	5,724	5,500	0.00%	5,500	5,500	5,500
					TAF Variance	0.50%	0.99%	1.98%											
Parkston	Parkston Municipal	8V3	A/B-I	3,460	0.10%	3,477	3,495	3,530	11	315	0.20%	3,495	3,530	3,601	3,460	0.00%	3,460	3,460	3,460
					TAF Variance	0.50%	0.99%	1.98%											
Philip	Philip	PHP	A/B-I	668	0.10%	671	675	681	13	51	0.20%	675	681	695	1,062	-0.06%	1,050	1,050	1,050
					TAF Variance	-56.40%	-55.62%	-54.07%											
Pine Ridge	Pine Ridge	IEN	A/B-I	2,400	0.10%	2,412	2,424	2,448	-	N/A	N/A	N/A	N/A	N/A	2,400	0.00%	2,400	2,400	2,400
					TAF Variance	0.50%	0.99%	1.98%											
Platte	Platte Municipal	1D3	A/B-I	696	0.10%	699	703	710	15	46	1.00%	732	769	849	696	0.00%	696	696	696
					TAF Variance	0.50%	0.99%	1.98%											
Redfield	Redfield Municipal	1D8	B-II	4,000	0.40%	4,081	4,163	4,332	11	364	0.50%	4,101	4,205	4,420	4,000	0.00%	4,000	4,000	4,000
					TAF Variance	1.98%	3.91%	7.67%											
Rosebud	Rosebud Sioux Tribal	SUO	B-II	1,200	0.40%	1,224	1,249	1,300	-	N/A	N/A	N/A	N/A	N/A	1,200	0.00%	1,200	1,200	1,200
					TAF Variance	1.98%	3.91%	7.67%											
Sisseton	Sisseton Municipal	8D3	A/B-I	3,320	0.10%	3,337	3,353	3,387	10	332	0.20%	3,353	3,387	3,455	3,320	0.00%	3,320	3,320	3,320
					TAF Variance	0.50%	0.99%	1.98%											

Associated City	Airport Name	FAA ID	ARC	2018 GA Operations (Airport Reported)	ARC Methodology				OPBA Methodology						TAF				
					CAGR 2018-2038	2023	2028	2038	2018 Based Aircraft	OPBA	CAGR 2018-2038	2023	2028	2038	2018 GA Operations (TAF)	CAGR 2018-2038	2023	2028	2038
Spearfish	Black Hills-Clyde Ice Field	SPF	B-II	14,533	0.40%	14,826	15,125	15,741	70	208	1.00%	15,274	16,053	17,733	14,533	1.18%	15,039	16,088	18,358
					TAF Variance	-1.44%	-6.37%	-16.63%											
Springfield	Springfield Municipal	Y03	B-I	2,700	0.10%	2,714	2,727	2,755	10	270	0.20%	2,727	2,754	2,810	2,706	-0.01%	2,700	2,700	2,700
					TAF Variance	0.50%	0.99%	1.98%											
Sturgis	Sturgis Municipal	49B	B-I	8,300	0.10%	8,342	8,383	8,468	47	177	0.50%	8,510	8,724	9,171	11,524	-0.01%	11,500	11,500	11,500
					TAF Variance	-37.86%	-37.18%	-35.81%											
Tea	Marv Skie-Lincoln County	Y14	B-I	35,650	0.10%	35,829	36,008	36,370	80	446	1.00%	37,469	39,380	43,500	16,680	-0.05%	16,500	16,500	16,500
					TAF Variance	53.95%	54.18%	54.63%											
Vermillion	Harold Davidson Field	VMR	B-II	4,098	0.40%	4,181	4,265	4,439	23	178	1.00%	4,307	4,527	5,000	4,098	-0.02%	4,080	4,080	4,080
					TAF Variance	2.41%	4.34%	8.08%											
Wagner	Wagner Municipal	AGZ	A/B-I	500	0.10%	503	505	510	13	38	0.50%	513	526	552	3,120	0.00%	3,120	3,120	3,120
					TAF Variance	-520.89%	-517.79%	-511.65%											
Wall	Wall Municipal	6V4	B-I	3,740	0.10%	3,759	3,778	3,816	13	288	0.20%	3,778	3,815	3,892	3,406	0.66%	3,883	3,883	3,883
					TAF Variance	-3.31%	-2.79%	-1.77%											
Webster	The Sigurd Anderson	1D7	A/B-I	960	0.10%	965	970	979	4	240	0.20%	970	979	999	960	0.00%	960	960	960
					TAF Variance	0.50%	0.99%	1.98%											
Wessington Springs	Wessington Springs	4X4	A/B-I	150	0.10%	151	152	153	4	38	0.50%	154	158	166	150	0.00%	150	150	150
					TAF Variance	0.50%	0.99%	1.98%											
Winner	Winner Regional	ICR	A/B-II	4,520	0.40%	4,611	4,704	4,896	16	283	0.20%	4,565	4,611	4,704	16,860	0.00%	16,800	16,800	16,800
					TAF Variance	-264.34%	-257.14%	-243.16%											
Yankton	Chan Gurney Municipal	YKN	B-II	4,002	0.40%	4,083	4,165	4,335	34	118	1.00%	4,206	4,421	4,883	7,820	-0.08%	7,700	7,700	7,700
					TAF Variance	-88.34%	-84.63%	-77.43%											
	Statewide Totals			**256,924**	**0.61%**	**264,382**	**272,356**	**290,354**	**863**	**13,348**	**0.65%**	**262,536**	**272,165**	**292,758**	**265,540**	**0.08%**	**264,264**	**266,044**	**269,722**
					Statewide TAF Variance	0.04%	2.38%	7.11%											

Sources: Kimley-Horn, 2020; FAA TAF 2018
Note: Pine Ridge and Rosebud did not report any based aircraft, therefore the OPBA methodology could not be applied to these airports.

4.5.3. Military Operations

As previously noted in the commercial activity forecast section, the future of military operations is oftentimes difficult to ascertain as this information is dependent on national security needs. As these needs cannot be easily predicted, forecasts for future military operations are held at a constant rate into the planning horizon. Therefore, military operations are anticipated to remain flat through 2038.

Table 4-10 shows the military operations for 2018 as reported in the TAF and as reported by airports. In some cases, the operation counts vary significantly. When looking at the TAF reported military operations, GA airports represent 17 percent of that state's total military operations. The GA airport handling the largest number of military operations is Phillip Airport with 240 operations as reported by the TAF.

Table 4-10: 2018 Military Operations by Source

Associated City	Airport Name	FAA ID	2018 Military Operations (TAF)	2018 Military Operations (Airport Reported)
General Aviation				
Belle Fourche	Belle Fourche Municipal	EFC	6	0
Bison	Bison Municipal	6V5	0	0
Britton	Britton Municipal	BTN	0	0
Brookings	Brookings Regional	BKX	100	80
Buffalo	Harding County	9D2	0	0
Canton	Canton Municipal	7G9	0	0
Chamberlain	Chamberlain Municipal	9V9	6	6
Clark	Clark County	8D7	0	0
Custer	Custer County	CUT	12	400
De Smet	Wilder	6E5	0	0
Eagle Butte	Cheyenne Eagle Butte	84D	0	0
Edgemont	Edgemont Municipal	6V0	0	0
Eureka	Eureka Municipal	3W8	0	0
Faith	Faith Municipal	D07	0	0
Faulkton	Faulkton Municipal	3FU	0	0
Flandreau	Flandreau Municipal	4P3	0	0
Gettysburg	Gettysburg Municipal	0D8	0	0
Gregory	Gregory Municipal-Flynn Field	9D1	0	0
Highmore	Highmore Municipal	9D0	0	0
Hot Springs	Hot Springs Municipal	HSR	120	120
Hoven	Hoven Municipal	9F8	0	0
Howard	Howard Municipal	8D9	0	0

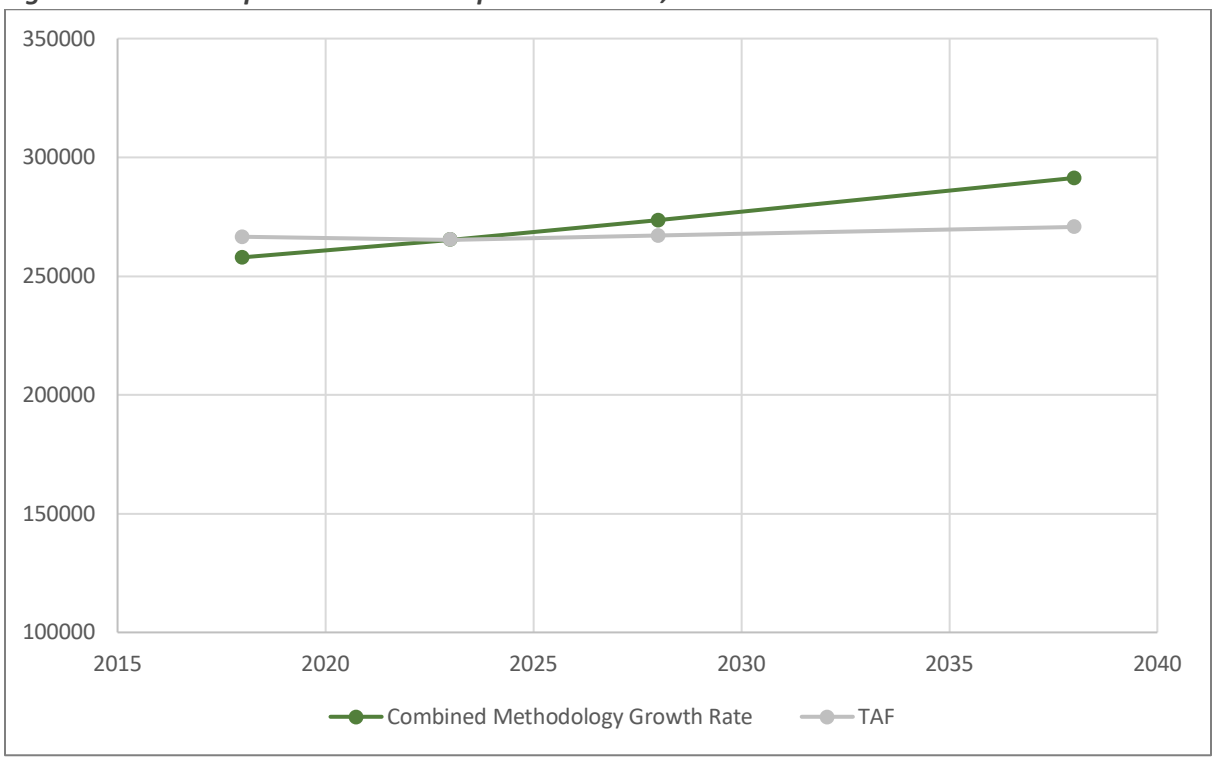
Associated City	Airport Name	FAA ID	2018 Military Operations (TAF)	2018 Military Operations (Airport Reported)
Huron	Huron Regional	HON	200	200
Lemmon	Lemmon Municipal	LEM	0	0
Madison	Madison Municipal	MDS	0	0
Martin	Martin Municipal	9V6	0	0
McLaughlin	Mc Laughlin Municipal	5P2	0	0
Milbank	Milbank Municipal	1D1	0	0
Miller	Miller Municipal	MKA	0	0
Mitchell	Mitchell Municipal	MHE	60	60
Mobridge	Mobridge Municipal	MBG	18	25
Murdo	Murdo Municipal	8F6	0	0
Onida	Onida Municipal	98D	0	0
Parkston	Parkston Municipal	8V3	0	0
Philip	Philip	PHP	240	0
Pine Ridge	Pine Ridge	IEN	0	0
Platte	Platte Municipal	1D3	0	0
Redfield	Redfield Municipal	1D8	0	0
Rosebud	Rosebud Sioux Tribal	SUO	0	0
Sisseton	Sisseton Municipal	8D3	0	0
Spearfish	Black Hills-Clyde Ice Field	SPF	200	200
Springfield	Springfield Municipal	Y03	0	0
Sturgis	Sturgis Municipal	49B	0	0
Tea	Marv Skie-Lincoln County	Y14	0	0
Vermillion	Harold Davidson Field	VMR	0	0
Wagner	Wagner Municipal	AGZ	0	0
Wall	Wall Municipal	6V4	0	75
Webster	The Sigurd Anderson	1D7	0	0
Wessington Springs	Wessington Springs	4X4	0	0
Winner	Winner Regional	ICR	0	0
Yankton	Chan Gurney Municipal	YKN	12	20
	Statewide Totals		**974**	**1186**

Sources: Kimley-Horn, 2020; FAA TAF 2018

4.5.4. Total Operations at GA Airports

This section summarizes all operations at the GA airports in the system. The findings for GA operations and military operations were summed to provide the total projected values for all operations at GA airports. The combined results of the GA, and military operations were compared with the TAF forecast for total operations. **Figure 4-10** illustrates the difference between these combined preferred methodologies (one for GA operations, and the flat-lined military operations) and the TAF. The difference in growth is expected since the preferred methodology for GA operations is higher than the TAF. The difference in the baseline data is a result of the difference between using airport reported data and TAF data for the 2018 baseline year.

Figure 4-10: Total Operations at GA Airports Forecasts, 2018-2038



Sources: Kimley-Horn, 2020; FAA TAF 2018

Table 4-11 shows the results of the total operations at system GA airports for each forecast year. The combined methodology results in an increase of 33,430 operations (annual growth rate of 0.61 percent) over the 20-year forecast period, while the TAF projection estimates an increase of 4,182 operations, with an annual growth rate of 0.08 percent. The table also shows TAF variance for 5-, 10-, and 20-year projections. The variance between projected total operations and the TAF exceeds thresholds for some airports. This stems from a difference in the number of GA operations and military operations reported by airports for 2018 and the GA operation and military counts from the TAF. This initial discrepancy in baseline data creates some significant variances occurring at the individual airport level. However, when all GA airports are considered, the variance falls well within the thresholds statewide.

Table 4-11: Total Operations at GA Airports Forecasts, 2018-2038

Associated City	Airport Name	FAA ID	Combined Methodology					TAF TOTAL Ops at GA Airports				
			2018 Total Operations (Airport Reported)	CAGR 2018-2038	2023	2028	2038	2018 Total Operations (TAF)	CAGR 2018-2038	2023	2028	2038
Belle Fourche	Belle Fourche Municipal	EFC	1,644	0.10%	1,652	1,660	1,677	4,206	0.00%	4,206	4,206	4,206
				TAF Variance	-154.57%	-153.30%	-150.79%					
Bison	Bison Municipal	6V5	2,280	0.10%	2,291	2,303	2,326	2,280	0.00%	2,280	2,280	2,280
				TAF Variance	0.50%	0.99%	1.98%					
Britton	Britton Municipal	BTN	2,740	0.10%	2,754	2,768	2,795	2,740	0.00%	2,740	2,740	2,740
				TAF Variance	0.50%	0.99%	1.98%					
Brookings	Brookings Regional	BKX	47,500	1.00%	49,918	52,459	57,937	31,405	-0.10%	30,755	30,755	30,755
				TAF Variance	38.39%	41.37%	46.92%					
Buffalo	Harding County	9D2	750	0.50%	769	788	829	1,020	0.00%	1,020	1,020	1,020
				TAF Variance	-32.65%	-29.38%	-23.09%					
Canton	Canton Municipal	7G9	3,800	1.00%	3,994	4,198	4,637	1,700	0.00%	1,700	1,700	1,700
				TAF Variance	57.43%	59.50%	63.34%					
Chamberlain	Chamberlain Municipal	9V9	7512	0.20%	7,512	7,663	7,818	7,512	0.00%	7,506	7,506	7,506
				TAF Variance	0.08%	2.05%	3.99%					
Clark	Clark County	8D7	3,200	1.00%	3,363	3,535	3,905	3,200	-0.01%	3,196	3,196	3,196
				TAF Variance	4.97%	9.58%	18.15%					
Custer	Custer County	CUT	5,872	0.05%	5,872	5,901	5,931	3,660	0.52%	3,760	3,860	4,058
				TAF Variance	35.97%	34.59%	31.58%					
De Smet	Wilder	6E5	40	0.05%	40	40	40	1,680	0.00%	1,680	1,680	1,680
				TAF Variance	-4100.00%	-4079.06%	-4058.23%					
Eagle Butte	Cheyenne Eagle Butte	84D	2,248	0.05%	2,248	2,259	2,271	2,248	0.00%	2,248	2,248	2,248
				TAF Variance	0.00%	0.50%	0.99%					
Edgemont	Edgemont Municipal	6V0	208	0.05%	208	209	210	208	0.00%	208	208	208
				TAF Variance	0.00%	0.50%	0.99%					
Eureka	Eureka Municipal	3W8	580	0.20%	586	592	604	580	0.00%	580	580	580
				TAF Variance	0.99%	1.98%	3.92%					
Faith	Faith Municipal	D07	1,280	0.10%	1,286	1,293	1,306	1,280	0.00%	1,280	1,280	1,280
				TAF Variance	0.50%	0.99%	1.98%					
Faulkton	Faulkton Municipal	3FU	3,560	0.40%	3,632	3,705	3,856	3,560	0.00%	3,560	3,560	3,560
				TAF Variance	1.98%	3.91%	7.67%					
Flandreau	Flandreau Municipal	4P3	3,478	0.10%	3,495	3,513	3,548	3,440	0.00%	3,440	3,440	3,440

Associated City	Airport Name	FAA ID	Combined Methodology					TAF TOTAL Ops at GA Airports				
			2018 Total Operations (Airport Reported)	CAGR 2018-2038	2023	2028	2038	2018 Total Operations (TAF)	CAGR 2018-2038	2023	2028	2038
				TAF Variance	1.59%	2.08%	3.05%					
Gettysburg	Gettysburg Municipal	0D8	5,600	0.40%	5,713	5,828	6,065	8,754	0.91%	9,155	9,577	10,484
				TAF Variance	-60.25%	-64.33%	-72.85%					
Gregory	Gregory Municipal-Flynn Field	9D1	4,320	0.10%	4,342	4,363	4,407	2,712	-0.02%	2,700	2,700	2,700
				TAF Variance	37.81%	38.12%	38.74%					
Highmore	Highmore Municipal	9D0	17	0.40%	17	18	18	5,620	0.00%	5,620	5,620	5,620
				TAF Variance	-32305.51%	-31665.10%	-30422.01%					
Hot Springs	Hot Springs Municipal	HSR	2,987	0.38%	3,045	3,104	3,225	6,884	0.52%	7,132	7,341	7,644
				TAF Variance	-134.24%	-136.52%	-137.00%					
Hoven	Hoven Municipal	9F8	1,520	0.10%	1,528	1,535	1,551	1,520	0.00%	1,520	1,520	1,520
				TAF Variance	0.50%	0.99%	1.98%					
Howard	Howard Municipal	8D9	720	0.10%	724	727	735	720	0.00%	720	720	720
				TAF Variance	0.50%	0.99%	1.98%					
Huron	Huron Regional	HON	11,400	1.77%	12,445	13,587	16,202	13,452	-0.49%	12,200	12,200	12,200
				TAF Variance	1.97%	10.21%	24.70%					
Lemmon	Lemmon Municipal	LEM	890	0.40%	908	926	964	4,820	0.00%	4,820	4,820	4,820
				TAF Variance	-430.87%	-420.38%	-400.01%					
Madison	Madison Municipal	MDS	14,960	0.40%	15,262	15,569	16,203	14,960	-0.02%	14,900	14,900	14,900
				TAF Variance	2.37%	4.30%	8.04%					
Martin	Martin Municipal	9V6	1,540	0.40%	1,571	1,603	1,668	348	0.00%	348	348	348
				TAF Variance	77.85%	78.29%	79.14%					
McLaughlin	Mc Laughlin Municipal	5P2	130	0.10%	131	131	133	636	0.00%	636	636	636
				TAF Variance	-386.79%	-384.37%	-379.55%					
Milbank	Milbank Municipal	1D1	4,440	0.10%	4,462	4,485	4,530	4,440	0.00%	4,440	4,440	4,440
				TAF Variance	0.50%	0.99%	1.98%					
Miller	Miller Municipal	MKA	6,100	0.10%	6,131	6,161	6,223	6,100	0.00%	6,100	6,100	6,100
				TAF Variance	0.50%	0.99%	1.98%					
Mitchell	Mitchell Municipal	MHE	14,940	2.39%	16,813	18,923	23,971	14,940	-0.20%	14,360	14,360	14,360
				TAF Variance	14.59%	24.11%	40.09%					
Mobridge	Mobridge Municipal	MBG	393	0.38%	401	408	424	5,542	-0.02%	5,518	5,518	5,518
				TAF Variance	-1277.57%	-1251.55%	-1200.90%					

Associated City	Airport Name	FAA ID	Combined Methodology					TAF TOTAL Ops at GA Airports				
			2018 Total Operations (Airport Reported)	CAGR 2018-2038	2023	2028	2038	2018 Total Operations (TAF)	CAGR 2018-2038	2023	2028	2038
Murdo	Murdo Municipal	8F6	400	0.10%	402	404	408	400	0.00%	400	400	400
				TAF Variance	0.50%	0.99%	1.98%					
Onida	Onida Municipal	98D	5,500	0.10%	5,528	5,555	5,611	5,500	0.00%	5,500	5,500	5,500
				TAF Variance	0.50%	0.99%	1.98%					
Parkston	Parkston Municipal	8V3	3,460	0.10%	3,477	3,495	3,530	3,460	0.00%	3,460	3,460	3,460
				TAF Variance	0.50%	0.99%	1.98%					
Philip	Philip	PHP	908	0.10%	911	915	921	1,302	-0.05%	1,290	1,290	1,290
				TAF Variance	-41.55%	-41.03%	-39.99%					
Pine Ridge	Pine Ridge	IEN	2,400	0.10%	2,412	2,424	2,448	2,400	0.00%	2,400	2,400	2,400
				TAF Variance	0.50%	0.99%	1.98%					
Platte	Platte Municipal	1D3	696	0.10%	699	703	710	696	0.00%	696	696	696
				TAF Variance	0.50%	0.99%	1.98%					
Redfield	Redfield Municipal	1D8	4,000	0.40%	4,081	4,163	4,332	4,000	0.00%	4,000	4,000	4,000
				TAF Variance	1.98%	3.91%	7.67%					
Rosebud	Rosebud Sioux Tribal	SUO	1,200	0.40%	1,224	1,249	1,300	1,200	0.00%	1,200	1,200	1,200
				TAF Variance	1.98%	3.91%	7.67%					
Sisseton	Sisseton Municipal	8D3	3,320	0.10%	3,337	3,353	3,387	3,320	0.00%	3,320	3,320	3,320
				TAF Variance	0.50%	0.99%	1.98%					
Spearfish	Black Hills-Clyde Ice Field	SPF	14,733	0.39%	15,026	15,325	15,941	14,733	1.16%	15,239	16,288	18,558
				TAF Variance	-1.42%	-6.28%	-16.42%					
Springfield	Springfield Municipal	Y03	2,700	0.10%	2,714	2,727	2,755	2,706	-0.01%	2,700	2,700	2,700
				TAF Variance	0.50%	0.99%	1.98%					
Sturgis	Sturgis Municipal	49B	8,300	0.10%	8,342	8,383	8,468	11,524	-0.01%	11,500	11,500	11,500
				TAF Variance	-37.86%	-37.18%	-35.81%					
Tea	Marv Skie-Lincoln County	Y14	35,650	0.10%	35,829	36,008	36,370	16,680	-0.05%	16,500	16,500	16,500
				TAF Variance	53.95%	54.18%	54.63%					
Vermillion	Harold Davidson Field	VMR	4,098	0.40%	4,181	4,265	4,439	4,098	-0.02%	4,080	4,080	4,080
				TAF Variance	2.41%	4.34%	8.08%					
Wagner	Wagner Municipal	AGZ	500	0.10%	503	505	510	3,120	0.00%	3,120	3,120	3,120
				TAF Variance	-520.89%	-517.79%	-511.65%					
Wall	Wall Municipal	6V4	3,740	0.10%	3,759	3,778	3,816	3,406	0.66%	3,883	3,883	3,883

Associated City	Airport Name	FAA ID	Combined Methodology					TAF TOTAL Ops at GA Airports				
			2018 Total Operations (Airport Reported)	CAGR 2018-2038	2023	2028	2038	2018 Total Operations (TAF)	CAGR 2018-2038	2023	2028	2038
				TAF Variance	-3.31%	-2.79%	-1.77%					
Webster	The Sigurd Anderson	1D7	960	0.10%	965	970	979	960	0.00%	960	960	960
				TAF Variance	0.50%	0.99%	1.98%					
Wessington Springs	Wessington Springs	4X4	150	0.10%	151	152	153	150	0.00%	150	150	150
				TAF Variance	0.50%	0.99%	1.98%					
Winner	Winner Regional	ICR	4,520	0.40%	4,611	4,704	4,896	16,860	-0.02%	16,800	16,800	16,800
				TAF Variance	-264.34%	-257.14%	-243.16%					
Yankton	Chan Gurney Municipal	YKN	4,014	0.40%	4,095	4,177	4,347	7,832	-0.08%	7,712	7,712	7,712
				TAF Variance	-88.34%	-84.63%	-77.43%					
		Statewide Totals	**257,898**	**0.61%**	**265,356**	**273,510**	**291,328**	**266,514**	**0.08%**	**265,238**	**267,018**	**270,696**
				Statewide TAF Variance	**0.04%**	**2.37%**	**7.08%**					

Sources: Kimley-Horn, 2020; FAA TAF 2018

4.6. Summary

Realistic forecasts are imperative to planning for future system needs, particularly in terms of accommodating changes in aviation activity demands and changes in aircraft types. The forecasts for the 2020 SDSASP used historical and current data to determine potential changes to future demand. South Dakota's socioeconomic indicators show growth, and that growth is represented in the expected aviation growth in the state. The forecasts in this chapter show growth at commercial service airports in terms of enplanements, GA and commercial service operations, and based aircraft. Additionally, GA airports in the South Dakota system are also anticipated to experience slow but steady growth in the number of based aircraft and operations. The projections in this chapter are rooted in national trends and tailored to each of the 56 system airports. **Table 4-12** Provides summary a summary of the 5- and 10-year projection figures comparing the preferred methodologies, and TAF projections to demonstrate that the selected preferred methodologies throughout this chapter are within the 10 percent variance allowed from the TAF for the first five years, and 15 percent variance allowed from the TAF for the first ten years as required by the FAA.

Table 4-12: Comparison of Forecast Results for the First Ten Years

Forecast Element	2023 (5-Year Forecast)			2028 (10-year Forecast)		
	Preferred Methodologies	TAF	TAF Variance	Preferred Methodologies	TAF	TAF Variance
Commercial Service						
Enplanements	986,553	1,012,498	-2.63%	1,077,729	1,123,938	-4.29%
Based Aircraft	432	449	-3.94%	454	469	-3.30%
Commercial Service Operations	79,881	72,689	9.00%	85,245	76,779	9.93%
GA Operations	132,420	129,255	2.39%	139,175	133,373	4.17%
Military Operations[1]	4,799	4,799	0.00%	4,799	4,799	0.00%
Total Operations at CS Airports	217,100	206,743	4.77%	229,219	214,951	6.22%
General Aviation						
Based Aircraft	892	941	-5.54%	921	956	-3.75%
GA Operations	264,382	264,264	0.04%	272,536	266,044	2.38%
Military Operations[1]	974	974	0.00%	974	974	0.00%
Total Operations at GA Airports	265,356	265,238	0.12%	273,510	267,018	2.45%

Sources: Kimley-Horn, 2020; FAA TAF 2018

[1] TAF military operations were flatlined through the projection period.