3. FORECASTS OF AVIATION ACTIVITY

Projecting future aviation demand is a critical element in the master planning process since many proposals and recommendations within the master plan are based upon aviation activity demand forecasts. As noted in Federal Aviation Administration (FAA) Advisory Circular (AC) 150/5070-6B, *Airport Master Plans*, "Forecasts of future levels of aviation activity are the basis for effective decisions in airport planning. These projections are used to determine the need for new or expanded facilities. In general, forecasts should be realistic, based upon the latest available data, be supported by information in the study, and provide an adequate justification for airport planning and development."

Forecasts must be reasonable and defensible. They serve as the basis of future facility requirements.

The forecasts developed in this chapter will be used to project Colorado Plains Regional Airport's (AKO or the Airport) future activity necessary to determine the type, size, and timing of future development. Because the decision to identify and execute projects is largely based on the anticipated levels of demand, forecasting acts as the hub of a master planning process. Future aviation activity also determines the role of the Airport as well as the appropriate airport design standards, which are discussed below.

This chapter discusses projected aviation demand at AKO over the next 20 years, from 2016 to 2036. While forecasting considers the most accurate information available at the time the projections are completed, it is not an exact science. It must be recognized that there are likely to be some divergences of an airport's activity from a prepared forecast due to many factors that simply cannot be anticipated such as changes in aviation fuel prices, new regulations, and trends in the economy. However, when soundly established, the forecasts developed in a master plan will provide a sound, defensible, and defined rationale to guide the analysis of future airport development needs and alternatives.

This forecast presents the projected demand at AKO over the next 20 years.

The amount and type of aviation activity occurring at an airport are dependent upon many factors. These include but are not limited to the services available to aircraft operators, the businesses located on the airport or within the host community, and the economic conditions within the surrounding area. The AKO forecast analysis considers historical aviation trends at the Airport, the surrounding region, and throughout the nation.

Projections of aviation activity for AKO were prepared for the near-term (2021), intermediate-term (2026), and long-term (2036) time frames. The twenty-year planning period is FAA's recommended outlook period for airport master plans. Other forecasts discussed below cover different planning periods, such as FAA's Terminal Area Forecast (TAF), which extends to 2040.

The following resources were used to estimate activity and generate forecasts for AKO:

- 2005 AKO Airport Master Plan
- FAA Airport Master Record Form 5010
- 2015 FAA Terminal Area Forecast, issued January 2016

- Discussions with Airport Management
- Colorado 2011 Statewide Aviation System Plan
- 2016 FAA Aerospace Forecast
- Airport Market Area Demographic and Socioeconomic Projections

3.1 Aviation Activity Forecast Context

Activity at airports is influenced by national, state, and regional trends as well as various factors within the Airport's individual market area. Because of this, it is important that each of these are carefully analyzed to understand how the Airport reacts to influences.

3.1.1 National Aviation Trends

National trends within aviation are often reflected in airports and the local communities they serve, and should be considered in the development of activity projections. For AKO, various sources were used to examine current and anticipated trends influencing the general aviation industry:

- Federal Aviation Administration: FAA Aerospace Forecasts, 2016-2036
- General Aviation Manufacturers Association (GAMA): General Aviation Statistical Databook, 2015
- National Business Aircraft Association (NBAA): NBAA Business Aviation Fact Book, 2016 and earlier

General Aviation Industry

General Aviation includes all individual unscheduled aviation activities that enrich, enhance, preserve, and protect the lives of citizens.

General aviation (GA) aircraft are classified as all aircraft not flown by commercial airlines or the military. This includes an incredibly diverse array of flying that ranges from a personal vacation in a small single-engine plane, to an overnight package delivery, to an emergency medical evacuation, to a morning sightseeing flight, to flight instruction training new pilots, to helicopter traffic reports that keep drivers informed of rush-hour delays. Simply stated, general aviation encapsulates all individual unscheduled aviation activities that enrich, enhance, preserve, and protect the lives of citizens.

The FAA divides general aviation activities into six broad categories:

- Personal: About one-third of private flying in the United States is for personal reasons, which may include practicing flight skills, personal or family travel, personal enjoyment, or personal business.
- Instructional: All private flight instruction for purposes ranging from private pilot to airline pilot is conducted through general aviation.
- Corporate: About 12 percent of the total private flying in the United States is done in aircraft owned by a business and piloted by a professional. Most of these flights are in jets and cover long distances, with some flying to international destinations. Businesses elect to fly these trips to save time and expand their geographic and operational networks.

- Business: About 11 percent of private flying in the United States is done by business people flying to meetings or other events, primarily in piston or turboprop aircraft. Many pilots flying for business own or work for relatively small businesses and use the aircraft to accomplish missions that would otherwise take more time or would be infeasible.
- Air Taxi: When scheduled air service is either not available or inconvenient, businesses and individuals use charter aircraft from air taxis service providers. These flights save time and make it possible to fly directly to places that cannot be reached by scheduled service.
- Other: Given the diverse nature of general aviation, this category includes disaster relief, search and rescue, police operations, news reporting, border patrol, forest firefighting, aerial photography and surveying, crop dusting, and tourism activities, among many others.

General Aviation Trends

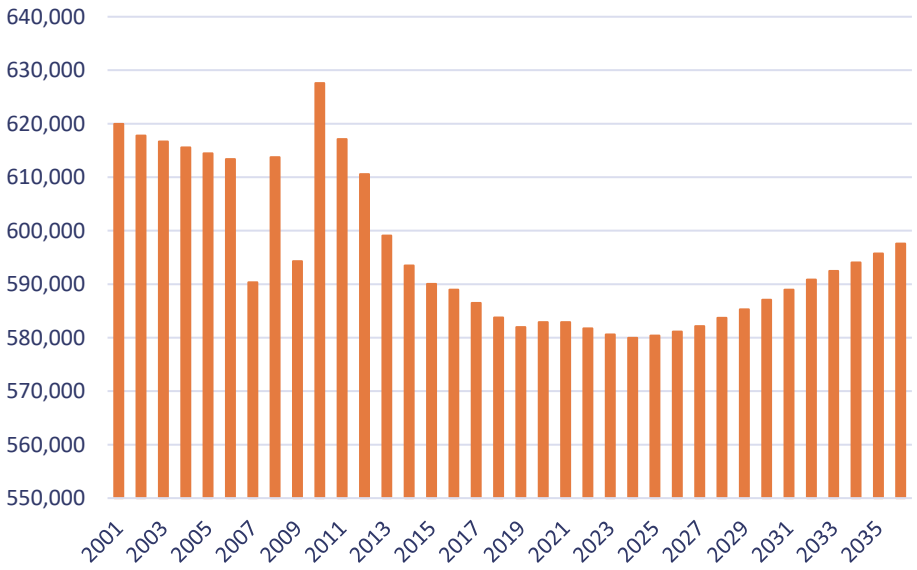
At the national level, business cycles and the price of aircraft ownership have impacts on general aviation demand levels. This section provides an overview of the most profound general aviation trends, as well as some of the various factors that have influenced those trends in the United States. These are important considerations in the development of projections of general aviation demand for AKO. According to the FAA, between 2001 and 2015 the total number of pilots decreased by 0.35 percent[1] annually. This decline impacts demand for aircraft activity throughout the country: the fewer pilots there are, the less flying will be done, resulting in fewer operations at airports.

The FAA develops forecasts of future levels of aviation activity from past trends and economic drivers. The most recent forecast available, in *FAA Aerospace Forecasts, Fiscal Years 2016-2036*, presents near-term and long-term forecasts, depicted in **Figure 3-1**. The FAA has forecasted the number of licensed pilots to increase 0.07 percent[1] each year for the next 20 years. Although this will not bring the total number of pilots back to its 2010 peak of 627,000, it may help increase the overall level of aviation activity and the number of operations at airports across the country.

The decline in the total number of pilots in the last 15 years impacts demand for aircraft activity throughout the country.

[1] https://www.faa.gov/data_research/aviation/aerospace_forecasts/

FIGURE 3-1: HISTORICAL AND FORECASTED NUMBER OF TOTAL PILOTS

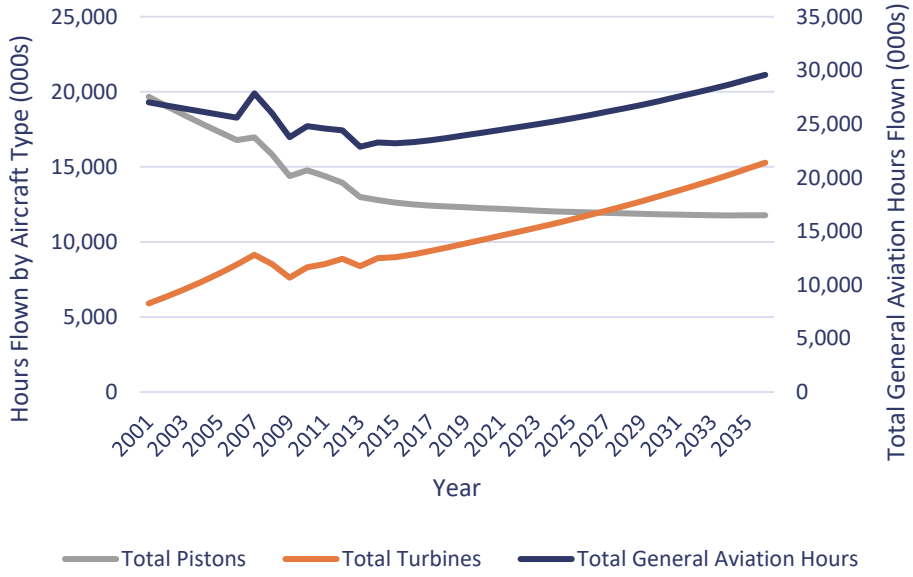


Source: FAA Aerospace Forecast, 2016-2036, Active Pilots by Type of Certificate
Note: Years 2002-2006 were interpolated based on FAA's AAGR

The FAA also tracks and projects a valuable metric known as active general aviation and air taxi hours flown. This is done through a nationwide survey conducted every two years. This metric captures several activity-related data including aircraft utilization, frequency of use, and duration of use.

As shown in **Figure 3-2**, hours flown in general aviation piston aircraft experienced a significant decrease of 3.4 percent annually from 2000 to 2014. However, this trend is expected to lessen over the 20-year planning period with an annual decrease rate of 0.5 percent. For turboprop and jet aircraft, hours flown are expected to continue to grow at a relatively high rate of 2.7 percent per year through 2036, primarily due to the high utilization of business aviation aircraft.

FIGURE 3-2: HISTORICAL AND FORECASTED GA AIRCRAFT HOURS



Source: FAA Aerospace Forecast 2016-2036, Active General Aviation and Air Taxi Hours Flown

Other trends that have and will affect general aviation activity include:

- The availability and cost of 100LL avgas. Avgas is the only leaded fuel allowed in the United States, and the FAA has been working with companies to develop an unleaded replacement. The majority of piston-engine aircraft use 100LL avgas. Some smaller displacement engines can use unleaded auto fuel (mogas) without ethanol, but auto fuel without ethanol is relatively scarce. Larger piston engines cannot use mogas, and they use the largest volume of 100LL. The three primary goals for the replacement of 100LL are to certify an unleaded fuel that can be used in all piston-engine airplanes, that can be used by the existing fuel storage and transportation system, and will cost approximately the same as the retail price of existing 100LL.
- User fees. Congress has considered a number of proposals to impose additional fees for the use of the National Airspace System and the services provided by FAA. There have also been discussions about privatizing the air traffic control system, similar to Canada, Australia, and other countries. Each of the aviation trade associations have noted that imposition of user fees would directly impact GA activity.
- New airport and airspace security regulations. After Congress created the Department of Homeland Security in 2002 and the Transportation Security Administration (TSA) in 2001, those agencies imposed new security regulations for commercial service airports. GA airports were not covered by those regulations, but if they were to be subject to similar security requirements in the future it would adversely impact GA activity. FAA has also imposed numerous temporary flight restrictions (TFR), many in response to security issues, some of which have adversely affected activity and businesses at GA airports. Any increase in the number and/or size of TFRs would further adversely impact GA activity.

Business Use of Aviation

AKO accommodates a wide range of corporate aircraft, which fly into the Airport for business travelers visiting the area. Companies and individuals use general aviation aircraft as a tool to improve efficiency and productivity of their business and personnel. Use of aircraft gives businesses control over their travel itineraries and destinations, and can greatly reduce travel time associated with scheduled airline service. FAA has noted that business aviation has been one of the fastest growing segments of GA activity over the last 15 years. However, even business aviation activity declined in 2009-2010 during the national recession, and although it has rebounded since then, it has not returned to the activity levels seen in 2007[2]. FAA noted in their Aerospace Forecast FY 2016-2036, "…the long-term outlook for general aviation, driven by turbine aircraft activity, remains favorable. The more expensive and sophisticated turbine-powered fleet (including rotorcraft) is projected to grow by 15,600 aircraft -- at an average rate of 2.1 percent a year over the forecast period, with the turbine jet portion increasing at 2.5 percent a year."

General Aviation can improve efficiency and productivity of businesses and personnel.

One trend to note is the popularity of fractional ownership, which began in the 1980s. These programs offer aircraft owners flexibility in their ownership and operation of their aircraft. The program uses current aircraft acquisition concepts, including shared or joint aircraft ownership, and provides for the management of the aircraft by an aircraft management company. Aircraft owners participating in the program agree to share ownership interest in an aircraft, and most also lease their aircraft to others in the program. The aircraft owners use a common management company to provide aviation management services including maintenance of the aircraft, pilot training and assignment, and leasing management of the aircraft.

Fractional ownership has continued to improve, even in an unsteady economy.

Even in an unsteady economy, fractional operators continue to see growth as previous customers re-enter the market or existing customers increase their fractional aircraft usage. In addition, fractional owners witness an increasing number of new prospects making the move to fractional ownership as an alternative to flying commercially or owning a business jet outright. In the United States, fractional ownership makes up 15 percent of business aviation flights.

Fractional ownership makes up 15 percent of business aviation flights in the United States.

Other users of GA aircraft—including crop spraying, flight training, medical transports, aerial surveying and photography, equipment sales and support, aircraft servicing and maintenance companies, heating/air conditioning companies, and medical service firms—are using jet/turbine aircraft to fly to AKO.

3.1.2 State/Regional Trends

National trends offer a broad summary of what has occurred across the country, but may be different than what has occurred locally. For this reason, it is important to consider state and regional trends that may influence AKO. The following information focuses on the region's economy and regional airport operations.

The large majority of GA airports in the United States do not have a control tower, including AKO. As a result, there is often no one counting GA takeoffs and landings, and aviation activity is estimated by a number of sources including the FAA, airport

[2] Source: FAA Business Jet Report, February 2017 Issue

managers, fixed-base operators (FBOs), and other airport users. It is not uncommon for those entities to estimate different levels of activity at a given non-towered airport. Some state agencies and airports use acoustical counters and video cameras to count takeoffs and landings at non-towered airports, but due to their cost and labor requirements they are not commonly used.

State/Regional General Aviation Airport Trends

The FAA issues a Terminal Area Forecast for each airport included in its National Plan of Integrated Airport Systems (NPIAS). The TAF provides historical activity data as well as forecasts through the year 2040. As noted above, the activity levels at non-towered airports are estimated based on input from other planning studies, airport managers, etc. Observing other GA airports near AKO provides an understanding of how the Airport's current and forecasted activity compares to other airports and identifies possible linkages for future opportunities. The FAA predicts most general aviation airports within 50 miles of AKO will not experience significant growth, if any, over the next 20 years (**Table 3-1**).

TABLE 3-1: REGIONAL GENERAL AVIATION TRENDS

Airport	FAA ID	Current Operations	Forecasted Operations (2036)	Based Aircraft	Forecasted Based Aircraft
Colorado Plains Regional	AKO	17,080	17,080	13	13
Kit Carson County	ITR	8,000	8,000	18	18
Yuma Municipal	2V6	4,264	4,300	17	17
Sterling Municipal	STK	2,165	2,165	34	44
Fort Morgan Municipal	FMM	9,543	10,000	23	23
Holyoke	HEQ	7,300	7,300	11	11
Wray Municipal	2V5	14,600	14,600	20	36

Source: 2015 FAA TAF, issued January 2016

Colorado Statewide Aviation System Plan

The Colorado Department of Transportation (CDOT), Aeronautics Division last updated the Colorado State Aviation System Plan (SASP) in 2011. "The plan helps to identify a system of airports and projects that meets the State's air transportation needs and supports its economic goals. The state aviation system plan also provides the Division of Aeronautics with an important planning tool to monitor how investment elevates overall system performance."[3] The plan measures and forecasts activity to determine if the system has sufficient capacity to meet future needs.

A state aviation system plan provides an important planning tool to monitor investments and the benefits to the whole state.

The SASP forecasted the growth rate of aircraft operations at general aviation airports throughout Colorado to be 0.7 percent per year through 2030. That relatively flat growth rate is consistent with FAA's TAF. The SASP also analyzed based aircraft and forecasted an average annual growth rate of 0.5 percent.

[3] 2011 Colorado Aviation System Plan - Technical Report

Colorado Business Incentives

Many states offer financial and other incentives for companies to relocate to their state. This can often help the area's economy grow and become more sustainable. The Colorado Office of Economic Development and International Trade offers a variety of incentives for companies to locate in the state. Akron is located within the Northeast Administrative Zone for Enterprise Tax Zone Credits, which provides state income tax credits that encourage businesses to locate and develop there. The Colorado Enterprise Zone Program is designed to promote a business-friendly environment in economically distressed areas[4].

Table 3-2 highlights other incentive programs Colorado offers to businesses relocating or starting within its borders.

TABLE 3-2: COLORADO BUSINESS INCENTIVES

Incentive Program Title	Description
Aviation Development Zone Tax Credit*	A program providing a state income tax credit of $1,200 per new full-time employee for businesses involved in the maintenance and repair, completion, or modification of aircraft located within approved Aviation Development Zone airports.
Colorado FIRST	A customized job training program that focuses on companies relocating to or expanding in Colorado and provides funds only to net new hires.
Enterprise Zone Tax Credit	These tax incentives encourage businesses to locate and expand in designated economically distressed areas of the state.
Job Growth Incentive Tax Credit	A performance-based program for businesses pursuing job creation projects that would not occur in Colorado without this support.
Job Growth Incentive Tax Credit-Higher Education Partnership	A program for businesses partnering with State Higher Institutions (HEI) to support job growth, academic development and economic expansion.
Strategic Fund Incentive	A performance-based program designed to encourage recruitment, retention and economic growth through Colorado by supporting Colorado Economic Development Commission (EDC) approved businesses that have created and maintained permanent net new jobs for one year.

Source: Colorado Office of Economic Development and International Trade http://choosecolorado.com/doing-business/incentives-financing/businesses-considering-colorado-site-selectors/
* AKO is not an eligible airport for the Aviation Development Zone Tax Credit

3.1.3 Airport Market Area

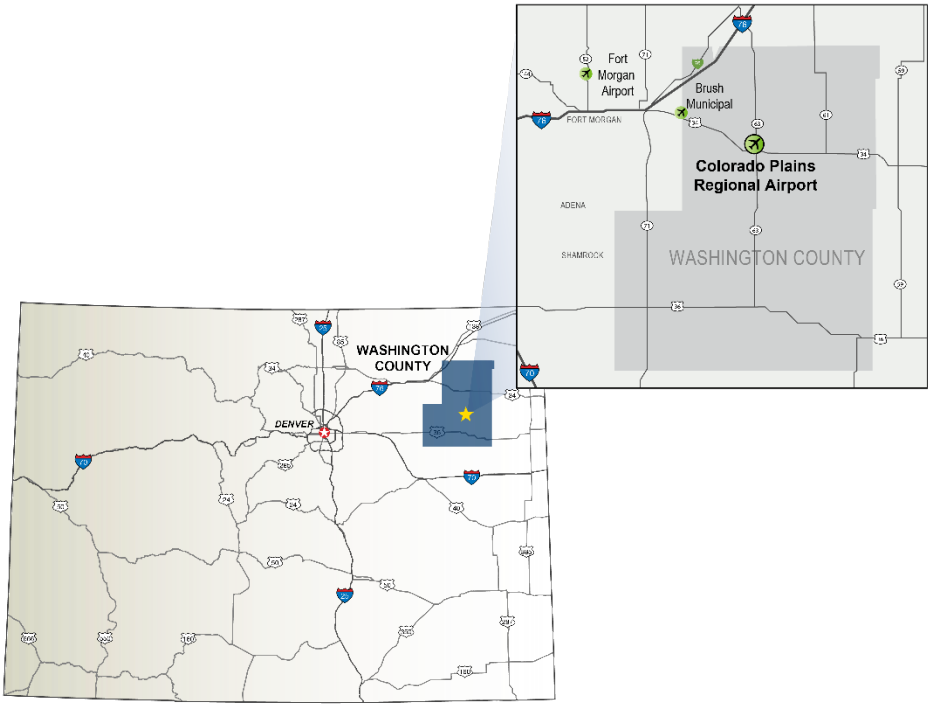
An airport's market area is defined as the geographic region served by a particular airport. The location and geographic attributes surrounding an airport can influence the type and levels of activity it experiences. For example, airports located near or in resort areas typically may receive many tourist travelers owning or using private aircraft. Located in a large agricultural county, Akron is considered a rural area.

An airport's market area is defined as the geographic region served by a particular airport.

The market area for AKO is Washington County (**Figure 3-3**). No other publicly owned airports are located within the county, making it probable that a resident of the county would utilize AKO, if needed.

[4] www.choosecolorado.com

FIGURE 3-3: AKO MARKET AREA



Source: Jviation

Demographics

Aviation demand is strongly tied to the number of people within an airport's market area, as well as their financial ability and desire to travel by air. Indicators such as trends in overall population, per capita and disposable personal income, and unemployment rates all have a bearing on aviation activity at a given airport.

The Colorado Department of Local Affairs notes: "Colorado's population is forecast to increase from 5,029,196 in 2010 to 6 million in 2020 and 7.01 million by 2030. This is an average annual growth rate of 1.7 percent followed by 1.5 percent. The forecasted growth rates are slightly slower than the previous decade yet faster than the US rate of 0.9 percent. The largest share of the population (82.4 percent) will continue to be along the Front Range with a growing share in the Western Slope, growing from 11 to 12 percent between 2010 and 2020."[5]

Washington County's population in 2015 was estimated to be 4,750[6]. The county's population has decreased 0.3 percent from 1970 to 2015. If this trend were to continue, the population of Washington County by the end of the planning period (2036) would be 4,340. Population forecasts prepared by the Colorado Department of Local Affairs shows relatively little growth in the county's population through 2050.

[5] https://demography.dola.colorado.gov/
[6] Woods and Poole Data, 2011

According to the Colorado Department of Local Affairs, in 2009 the per capita personal income in Washington County was less than the state and national average, which is consistent with other rural areas in the state (**Table 3-3**).

TABLE 3-3: PER CAPITA PERSONAL INCOME IN 2009

Area	Income
Washington County	$36,461
State of Colorado	$41,895
U.S. Average	$39,635

Source: Colorado Department of Local Affairs[5]

The combination of the relatively low growth in overall population in the county along with the county's per capita personal income indicates that the demand for aviation services will not likely experience strong growth unless there were significant new aviation services offered at AKO.

3.2 Historical and Existing Aviation Activity

Records of historical and existing based aircraft and operations are the starting point for future projections. AKO accommodates a wide variety of aviation activity, ranging from occasional air taxi operators to recreational, corporate activity, and public service operations. Since AKO does not have an air traffic control tower, operational levels must be estimated (as opposed to counted).

3.2.1 Based Aircraft

Per FAA, a based aircraft is operational and air worthy, and is typically stored at the facility for most of a year.

Per the FAA, a based aircraft is operational and airworthy, and is typically stored at the facility for most of a year[7]. It is not uncommon for primary sources of historical based aircraft data, such as the FAA TAF and airport records (Airport Master Record 5010), to vary from one another. FAA Form 5010, updated annually by airports, reports runway and taxiway information as well as based aircraft and aircraft operations totals. According to the FAA TAF, (dated 2015), AKO has 13 based aircraft. Airport management reported 13 single-engine, one multi-engine, and one helicopter for a total of 15 based aircraft. **Table 3-4** shows the counts of each based aircraft by type reported by FAA and the Airport Manager.

TABLE 3-4: BASED AIRCRAFT COUNT BY TYPE

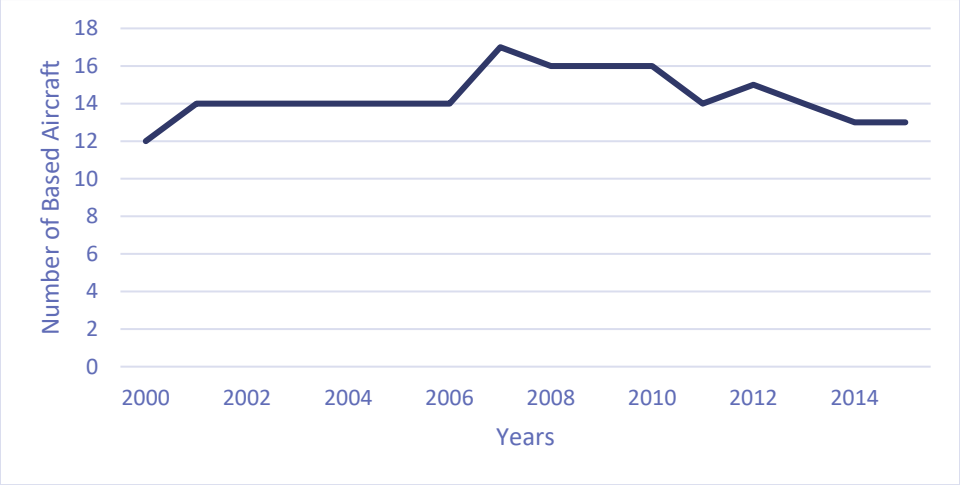
Aircraft Type	FAA TAF	Airport Manager
Single Engine	12	13
Multi Engine	0	1
Jet	0	0
Helicopter	1	1
Total	**13**	**15**

Source: FAA TAF, Airport Management

[7] FAA National Based Aircraft Inventory Program

Many factors influence airport operations and based aircraft, such as the price of tiedowns and hangars, the availability of fuel and support services such as maintenance, etc. **Figure 3-4** displays the number of based aircraft at AKO since 2000. The number of aircraft has fluctuated throughout the years, but has grown at an overall average annual growth rate of 0.54 percent.

FIGURE 3-4: HISTORICAL NUMBER OF BASED AIRCRAFT



Source: 2015 FAA TAF, issued January 2016

3.2.2 Aircraft Operations

An aircraft operation is defined as a takeoff or landing of any aircraft on an airport. The historical operations data includes activity conducted by based aircraft as well as operations conducted by itinerant[8] aircraft. Information related to aircraft operations is important in understanding the demand on the Airport and helps to serve as a basis for determining where improvements are needed.

An aircraft operation is defined as a takeoff or landing of any aircraft on an airport.

Since there is not an active air traffic control tower located at AKO, estimates of operations are based upon information from the FAA, CDOT, Airport Management records, and Airport tenants and users.

Per FAA Order 5090.3C, Paragraph 3-2(c), aviation forecasts at uncontrolled GA airports should use the following operations per based aircraft (OPBA) numbers when estimating activity:

a. 250 operations per based aircraft for rural general aviation airports with little itinerant traffic,
b. 350 operations per based aircraft for busier general aviation airports with more itinerant traffic, and
c. 450 operations per based aircraft for busy reliever airports.

Assuming AKO is a busier GA airport with 350 operations per based aircraft, annual operations would be estimated at 4,550 (350 operations x 13 based aircraft). Because

[8] Itinerant aircraft are aircraft based at other airports

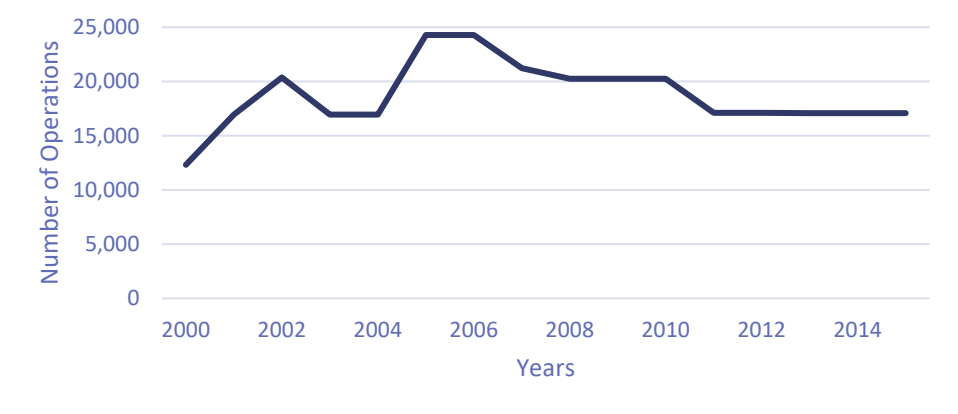
the TAF and reported levels of activity from the Airport Manager are much higher than the OPBA model (**Figure 3-5**), this method is not an accurate measure of forecasting. This is primarily based on two factors: very high seasonal agricultural operations and the high level of itinerant operations (more than 75 percent).

Since 2000, aircraft operations at AKO have fluctuated from a low of 12,316 in 2000 to a high in 2006 of 24,280 (**Figure 3-5**). Looking at historical trends, growth between 2000 and 2006 could be contributed to the increase in Airport business and an increase in the utilization of the based aircraft.

From 2008 to 2010, many industries were severely impacted by the economic downturn throughout the country, and the aviation industry was no exception. Fewer aircraft were purchased and the high operational costs of business aircraft caused aviation activity throughout the country to decline. Even with this national downturn trend, between 2000 and 2015 the average growth rate of aircraft operations at AKO has been 2.2 percent each year.

Airport Management reported an upward trend in agricultural (Ag) aircraft operations and noted that on certain days Ag aircraft exceed 200 operations per day in the early summer/spring. It is unknown if this trend will continue, or if the circumstances of the last few years will subside, reducing Ag aircraft operations.

FIGURE 3-5: HISTORICAL NUMBER OF AIRCRAFT OPERATIONS



Source: 2015 FAA TAF, issued January 2016

AKO'S operations data includes local activity conducted by based aircraft as well as those conducted by itinerant aircraft stored at other airports arriving at AKO for a variety of reasons including maintenance, business, recreation, or flight training. **Table 3-5** lists operations conducted by based aircraft versus itinerant aircraft.

TABLE 3-5: ITINERANT VERSUS LOCAL AIRCRAFT OPERATIONS

Year	Itinerant Operations	Local Operations	Total Operations	Itinerant Percentage of Total
2005	16,280	8,000	24,280	67%
2010	13,250	7,000	20,250	65%
2015	13,080	4,000	17,080	77%

Source: 2015 FAA TAF, issued January 2016

3.3 Projections of Aviation Activity

Projections of aviation activity are generated by using historical data and incorporating assumptions, conditions, and trends. Forecasting of any type is as much an art as it is a science, and no matter how sophisticated, it represents an educated guess at a point in time. Therefore, forecasts must be updated and revised as necessary to reflect changing conditions and developments.

As noted previously, it is difficult to accurately forecast events that could impact aviation activity at AKO such as rising fuel prices, new user fees, or changes in airport or airspace security regulations. Airport Management has noted that the FBO is seeking to add flight training, which could increase the number of based aircraft and operations by as much as 10 percent over current levels. Other events that could increase traffic at AKO include the basing of a corporate flight department at the Airport. In addition to the Airport's facilities, several factors affect the decision to open a flight school or base a flight department at AKO, including market conditions, the cost of doing business at AKO compared to other area airports, and required capital investment costs, among others.

During a master plan, aviation activity forecasts are typically developed using a wide variety of assumptions that can result in a wide range of outcomes. This is done intentionally to provide a broad view of future airport utilization based on a range of possible events that could affect activity. Once that broad view has been established, a careful examination of those assumptions is undertaken to determine which could be reasonably applied given that airport's current situation and opportunities.

3.3.1 AKO Based Aircraft Forecast

Estimating the number and types of aircraft expected to be based at AKO throughout the forecasting period will impact the need for future facilities and infrastructure requirements. In one perspective related to airport growth, as the number of aircraft based at an airport increases, so does the demand for aircraft storage and other facilities required at the Airport, particularly for tiedowns and hangars, as well as for fuel and other FBO services. **Table 3-6** and **Figure 3-6** show the results of four (no growth, low, medium, and high) based aircraft projections as well as their average annual growth rate (AAGR).

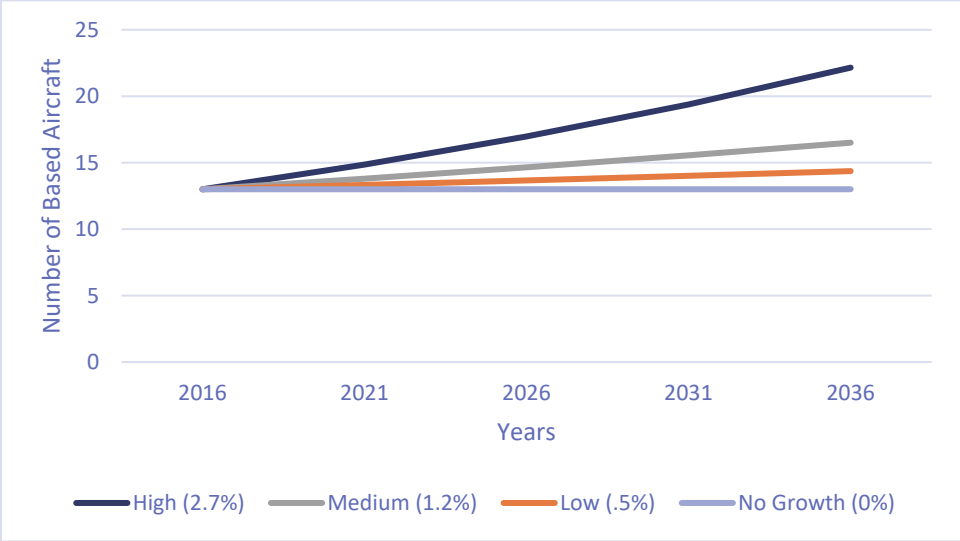
Possible forecasts of based aircraft range from an average growth rate of 0 percent to 2.7 percent.

TABLE 3-6: BASED AIRCRAFT PROJECTIONS

Year	High Growth	Medium Growth	Low Growth	No Growth
2015	13	13	13	13
Projections				
2021	15	14	13	13
2026	17	15	14	13
2031	19	16	14	13
2036	22	17	14	13
AAGR	**2.7%**	**1.2%**	**.5%**	**0%**

Sources: High: FAA Aerospace Forecast - Jet Aircraft; Medium: FAA Aerospace Forecast - GA Hours Flown; Low: 2011 Colorado SASP; No Growth: 2015 FAA TAF, issued January 2016

FIGURE 3-6: BASED AIRCRAFT FORECASTS 2016-2036



Sources: High: FAA Aerospace Forecast - Jet Aircraft; Medium: FAA Aerospace Forecast - GA Hours Flown; Low: 2011 Colorado SASP; No Growth: 2015 FAA TAF, issued January 2016

The number of business jets operating throughout the United States has been increasing for the past seven years. The FAA expects this trend will continue at an average annual growth rate of 2.7 percent per year. While AKO serves jet aircraft, there are no jet aircraft based at AKO; the decision to base jet aircraft at AKO is based on a number of factors, including the needs of the business and the cost of constructing hangars and related facilities (apron, access road, utility hookups). The fact that FAA projects that the number of corporate aircraft in the United States will increase throughout the forecast period increases the possibility that corporate aircraft will be based at AKO in the future.

Preferred Based Aircraft Forecast

The preferred based aircraft forecast shows a 1.2 percent increase per year.

The preferred based aircraft forecast is the medium-growth projection of 1.2 percent per year. It represents a reasonable and conservative growth projection for AKO while considering FAA outlooks and demographic characteristics unique to Washington County. This projection shows that the number of based aircraft at AKO will increase from 13 to 17 based aircraft within the 20-year planning period.

3.3.2 AKO Aircraft Operations Forecast

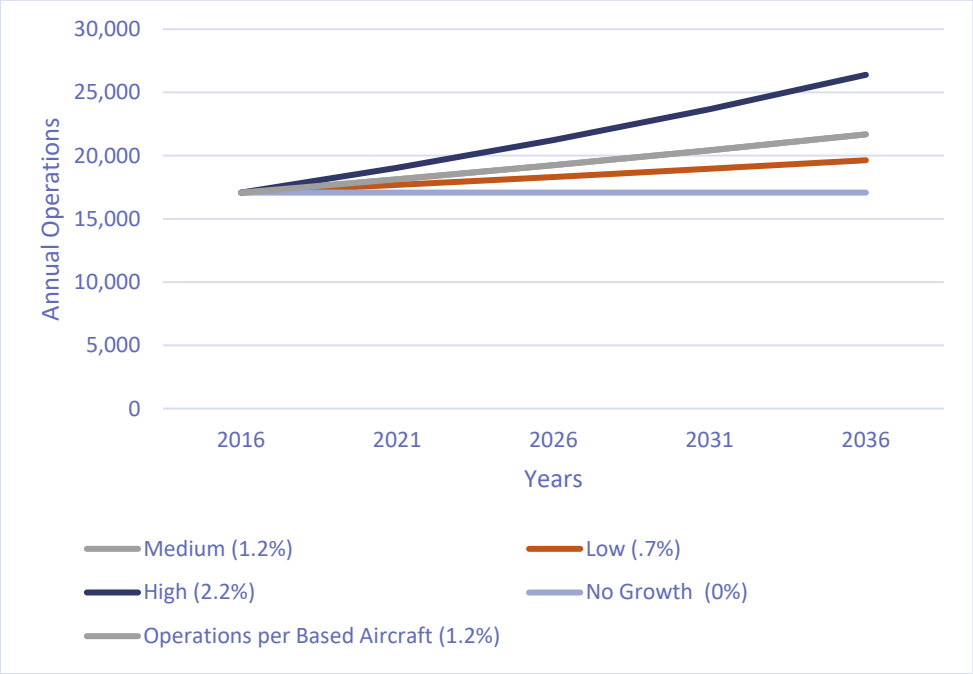
Annual operations represent the number of aircraft takeoffs and landings at an airport in one calendar year. Many different factors can influence the number of aircraft operations at an airport, including, but not limited to, total based aircraft, area demographics, activity and policies at neighboring airports, and national, state, and local aviation trends. These factors were used to develop projections of future aircraft operations at AKO, shown in **Table 3-7** and **Figure 3-7**.

TABLE 3-7: AIRCRAFT OPERATIONS FORECAST

Year	High Growth	Medium Growth	Low Growth	No Growth
2015	17,080	17,080	17,080	17,080
Projections				
2021	19,043	18,130	17,686	17,080
2026	21,232	19,244	18,314	17,080
2031	23,673	20,427	18,964	17,080
2036	26,394	21,682	19,637	17,080
AAGR	**2.2%**	**1.2%**	**.7%**	**0%**

Sources: High: FAA TAF - Historical Aircraft Operations; Medium: Operations Per Based Aircraft Ratio and FAA Aerospace Forecast (GA Hours Flown); Low: 2011 Colorado SASP; No Growth: 2015 FAA TAF, issued January 2016 - Forecasted Aircraft Operations

FIGURE 3-7: AIRCRAFT OPERATIONS FORECAST (2016-2036)



Sources: High: FAA TAF - Historical Aircraft Operations; Medium: Operations Per Based Aircraft Ratio and FAA Aerospace Forecast (GA Hours Flown); Low: 2011 Colorado SASP; No Growth: 2015 FAA TAF, issued January 2016 - Forecasted Aircraft Operations

AKO's 20-year operations forecasts range from 17,080 to 26,394 aircraft operations by the end of the planning period. Growth rates represented by these forecasts ranged from an AAGR of 0 percent to 2.2 percent. This range represents the most realistic growth considering the Airport's history and predicted regional, state, and national growth estimates.

AKO's 20-year operations forecasts ranging from 17,080 to 26,394 aircraft operations by the end of the planning period.

The high-range forecast represents the historical number of operations at AKO. The FAA predicts that general aviation activity will not increase throughout the planning period. Nationwide historical trends and forecasts demonstrate that the high forecasted growth rate is not a dependable planning tool.

Preferred Aircraft Operations Forecast

A 1.2 percent increase in aircraft operations projection is reasonable and considers the OPBA and FAA Aerospace Forecasts.

The preferred operations forecast is 1.2 percent, the medium-range projection. While the forecast is lower than historical operations growth projections, it is reasonable and considers the forecast from FAA Aerospace Forecast of general aviation hours flown. **Table 3-8** presents the preferred based aircraft and operations forecast with a breakdown of expected itinerant and local activity founded on the current split of operations (77 percent itinerant and 23 percent local).

TABLE 3-8: PREFERRED FORECASTS

	Current	2021	2026	2031	2036	AAGR
Based Aircraft	13	14	15	16	17	**1.2%**
Total Operations	17,080	18,130	19,244	20,427	21,682	**1.2%**
– Itinerant	13,080	13,960	14,818	15,729	16,695	
– Local	4,000	4,170	4,426	4,698	4,987	

Source: Jviation

3.4 Comparison with FAA TAF

To secure FAA approval for the master plan activity projections, FAA requires a comparison of the master plan forecasts to the annually produced TAF, preferring that airport planning forecasts not vary significantly from the TAF.

FAA looks for the two forecasts to be within 10 percent of their five-year forecasts and within 15 percent of their ten-year forecasts. If they are not within these tolerances, an explanation must be provided. A comparison between the forecasts shows that the preferred projections are within FAA tolerances (**Table 3-9**).

TABLE 3-9: FORECASTED OPERATIONS COMPARISON WITH FAA TAF

	Current	2021	2026	2031	2036	AAGR
Based Aircraft						
– Preferred Forecast	13	14	15	16	17	**1.2%**
– TAF	13	13	13	13	13	**0.0%**
Variance	*0%*	*6%*	*11%*	*20%*	*27%*	
Operations						
– Preferred Forecast	17,080	18,130	19,244	20,427	21,682	**1.2%**
– TAF	17,080	17,080	17,080	17,080	17,080	**0.0%**
Variance	*0%*	*6%*	*13%*	*20%*	*27%*	

Source: Jviation

3.5 Critical Aircraft Design

The development of an airport is influenced by the demand for various facilities, typically represented by total based aircraft and operations at an airport, and the type of aircraft that will use those facilities. In general, airport infrastructure

components are designed to accommodate the most demanding aircraft, referred to as the critical design aircraft, which will utilize the infrastructure on a regular basis.

The factors used to determine an airport's critical design aircraft are the approach speed and wing span/tail height of the most demanding class of aircraft that is anticipated to perform at least 500 annual itinerant operations at the airport during the planning period. That means that the critical design aircraft must perform at least one takeoff and landing every weekday throughout the course of a year.

Many airports, including large commercial service airports and GA airports, accommodate occasional operations by aircraft larger than the critical design aircraft. However, if larger airplanes do not generate sufficient activity throughout the year to meet FAA's definition of substantial use, those aircraft cannot typically be used to determine airport or airspace design standards.

After identifying an airport's critical design aircraft, it is then possible to determine the facility's Airport Reference Code (ARC). The ARC is a coding system defined by the FAA that relates airport design criteria to the operational and physical characteristics of the critical design aircraft. An airport's ARC is a composite designation based on the Approach Category and Airplane Design Group (wingspan and tail height) of that airport's critical aircraft.

Data from the FAA's Traffic Flow Management System Counts (TFMSC) database was used to evaluate historical corporate jet operations and help identify the appropriate critical design aircraft. The FAA's TFMSC data is based on flight plans and aircraft contacts with FAA approach control facilities, and identifies aircraft by type. However, FAA's TFMSC data does not include aircraft that did not file flight plans or contact approach control, so it does not capture 100 percent of activity. Corporate aircraft typically file plans because they normally operate under instrument flight rules (IFR) and also contact approach control, and therefore are well-represented in TFMSC data. Smaller piston-engine airplanes are less likely to file IFR flight plans or contact approach control and are not represented as well in the data.

Almost all the piston and turboprop aircraft at AKO fall within the A-1 to B-II ARC designations. Although a single aircraft within the B-II ARC does not operate more than 500 times per year at AKO, the collective group of aircraft that represent B-II operate well above the 500 operation thresholds. Therefore, based on the FAA guidelines, it is reasonable to assign the B-II ARC designation to AKO with a critical design aircraft as Citation Excel for both existing and future conditions.

AKO'S critical aircraft is a Citation Excel; thus, the ARC is B-II for existing and future needs.

From 2012 to 2016, 151 types of aircraft have reported arriving or departing at AKO; the total number of business jet operations was over 290 and included operations from Gulfstream V, Boeing 737, DC-8, and Embraer 190. These aircraft fall under the C-III ARC. If operations of aircraft of this size continue to increase, it is vital that the region has an airport of AKO's current size and capacity.

AKO routinely hosts aircraft able or willing to use surrounding area airports situated in Logan, Morgan, Sedgewick, Phillips, Yuma counties, and beyond. This is often due to the fact that AKO has services not offered at other airports. Additionally, many aircraft in the B-II ARC or larger require longer runways under certain conditions, especially during hot or snow/ice conditions. Because of these points, and AKO's

agenda to grow and attract businesses that increase airport activity, it is viewed as a resource throughout the northeastern Colorado region.

Competition for based aircraft, tenants, and transient aircraft depends largely on the facilities and services offered at airports within a region, as well as the prices charged. AKO can be compared to other general aviation airports in the area. **Table 3-10** lists some of the general aviation airports near AKO and their comparable data. Per Airport Management, AKO is home to one of the few full-service FBOs and full-service aircraft maintenance facilities in the region. Airports that have full maintenance capabilities and runway facilities similar to AKO are more than 100 miles away.

TABLE 3-10: COMPARISON OF AIRPORTS NEAR AKO

Airport (FAA ID)	Distance from AKO	Runway(s) & Dimensions (feet)	Annual Operations	Based Aircraft	Services Offered
Colorado Regional (AKO)	n/a	11/29: 7,001 x 100	17,080	13	100LL, Jet A, hangars, tiedowns, maintenance
Brush Municipal (7V5)	17.1 nm	7/25: 4,300 x 60	1,456	8	Tiedowns
Yuma Municipal (2V6)	23.7 nm	16/34: 4,200 x 75 12/30: 2,740 x 60	4,264	17	100LL, Jet A, hangars, tiedowns, maintenance
Sterling Municipal (STK)	26.4 nm	15/33: 5,201 x 75 4/22: 2,809 x 150	2,132	33	100LL, Jet A, hangars, tiedowns
Fort Morgan Municipal (FMM)	28.4 nm	14/32: 5,731 x 75 17/35: 5,216 x 80 8/26: 2,468 x 100	9,855	22	100LL, Jet A, hangars, tiedowns
Haxtun Municipal (17V)	38.9 nm	17/35: 1,650 x 30 8/26: 3,860 x 40	264	1	Tiedowns
Wray Municipal (2V5)	45.4 nm	17/35: 5,399 x 75	14,600	18	100LL, tiedowns

Source: AirNav, SkyVector

To preserve critical airfield infrastructure, an Ultimate ARC of C-III is recommended.

Corporate aircraft that operate at AKO include: Phenom 100 and 300, Falcon 900 and 2000, Citation CJ1-3, Cirrus SR 22, Piper Seminole, Piper Malibu, Pilatus PC-12, and Beech King Air 90, Bombardier Challenger 300 and 604, Bombardier Learjet 31-60, Citation Sovereign, Citation Excel, Cessna XLS, and Hawker 800. Runway 11/29 was designed and built to accommodate C-III aircraft, beyond the needs of B-II. As a valuable resource to the community and region, it is recommended that the Airport maintain airfield capabilities to accommodate C-III aircraft as an Ultimate objective. As such, the Airport Layout Plan (ALP) prepared for this study shows an Ultimate ARC of C-III in order to preserve critical airfield infrastructure (runway, associated safety and object free areas, taxiways, aprons, and others).

Further discussion for maintaining standards at AKO to C-III is discussed in **Chapter 4, Facility Requirements**, including the cost/benefit to maintaining C-III standards versus changes necessary to meet a lower ARC, the additional wind coverage the wider runway adds, and the benefits this size runway brings to the region.