3.0 AVIATION ACTIVITY & FORECASTS

3.1 Introduction

The FAA notes: "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. Any activity that could potentially create a facility need should be included in the forecast. Planners should prepare a reliable activity baseline, select an appropriate forecast methodology, develop a forecast, compare it to other forecasts for reasonableness, and submit the forecasts to the FAA for approval. The planning agency should use appropriate statistical techniques to estimate activity where actual operations counts are not available."[1]

In general, all forecasts are subject to similar constraints:

- Forecast accuracy (i.e. the level of statistical confidence) decreases over time. The number of variables that can affect aviation activity increase as time passes, and are difficult to predict, such as the cost of airplane ownership & operation, another economic recession, or more security regulations adopted by the TSA.
- Forecasts rely on assumptions about existing and future conditions, which change over time.
- External events on the statewide, national, and international level affect local activity, which can be difficult to predict or anticipate. For example, if the U.S. Environmental Protection Agency (EPA) adopts a rule that leaded fuel is no longer allowed to be sold in the United States, 100LL avgas could disappear and many piston engine airplanes could be grounded if a replacement fuel hasn't been certified by FAA.
- One other factor that affects the forecasts is the accuracy of the existing database. As noted previously, Kanab Municipal Airport (KNB or the Airport) is similar to most airports in Utah in that it does not have a control tower, and therefore activity levels are estimated, versus counted. The actual level of operations (takeoffs and landings) at KNB likely fall within the ranges discussed below, but it would require the use of manual or electronic counters, including audio or video monitors, to validate the estimated activity ranges.
- It should also be noted that KNB accommodates a variety of aircraft missions/activities, ranging from personal/discretionary flying to corporate and business, emergency medical services, government agency, construction support, law enforcement, sightseeing, flight training (currently from other airports), agricultural support, etc. KNB is used by second home owners and customers of local resorts, as well as other visitors who hike and hunt in the area.
- The Utah Airports Economic Impact Study listed numerous activities occur at KNB (**Table 3-1**). Each one of the activities and missions listed respond to different economic and

[1] FAA AC 150/5070-6B, *Airport Master Plans*, Chapter 7

industry-related factors. For example, discretionary/pleasure flying is relatively price sensitive and therefore declines as the cost of flying increases (e.g. when fuel prices increase), while corporate/business aviation, public service missions, and government aircraft are not as price sensitive.

TABLE 3-1 - AVIATION ACTIVITIES AT KNB

Type	Activity Level	Type	Activity Level	Type	Activity Level
Recreational Flying	M	Community Events	L	Environmental Patrol	L
Ag Spraying	L	Police	M	Medical Evacuation	H
Corporate/Business	M	Prisoner Transfer	M	Patient Transfers	H
Aerial Inspections	L	Military	L	Forest/Wildfire Fighting	H
Air Cargo	L	Career Training	L	Aerial Photography	L
Visitor Gateway	M	Search & Rescue/CAP	M	Real Estate Tours	L
Aerial Advertising	L	Traffic/News Reports	L	Air Shows	L

Key Activity Levels: H = High; M = Medium; L=Low.
Source Utah Airports Economic Impact Study

3.2 Aviation Industry Trends

Aviation is a dynamic industry, and it is constantly adjusting to both internal and external pressures (such as fluctuating aviation fuel prices, federal regulations that increased minimum experience required for newly hired airline pilots, rising cost of airplane ownership, etc.) The general aviation industry has experienced a number of challenges over the last decade, and industry analysts anticipate that a number of challenges will continue into the future, some of which are discussed below.

One specific indicator of the impact those challenges are having can be seen in the declining number of General Aviation (GA) aircraft operations at towered airports throughout Utah and the Western United States. GA activity on the national level over the last decade have shown similar trends (**Table 3-2** and **Figure 3-1**, **Figure 3-2, Figure 3-3, Figure 3-4, Figure 3-5,** and **Figure 3-6**) which indicates that the pressures from rising operating costs, changing pilot demographics, etc., are being reflected in declining GA activity.

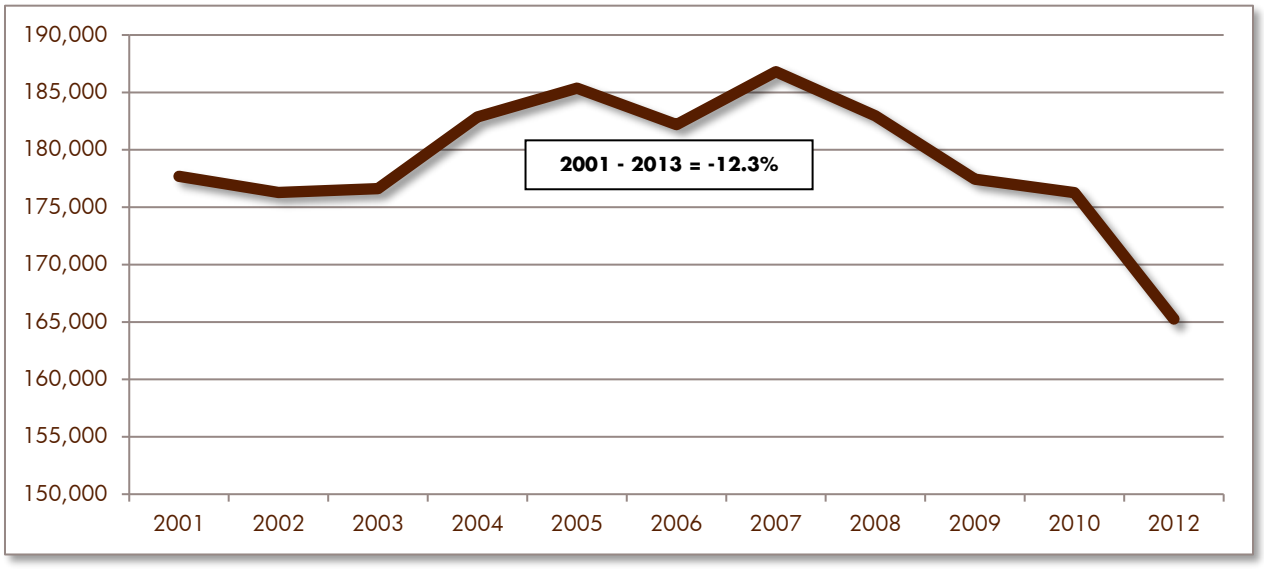
TABLE 3-2 – GA AIRCRAFT OPERATIONS AT TOWERED AIRPORTS
PERCENT CHANGE C.Y. 2000-2014

	GA Itinerant	GA Local	GA Total
FAA Northwest Mountain Region*	-31.7%	-23.2%	-27.8%
United States	-37.4%	-29.7%	-34.1%

Source: FAA Air Traffic Activity Data System (ATADS)
* FAA Northwest Mountain Region includes Utah, Colorado, Wyoming, Idaho, Oregon, Washington, and Montana.

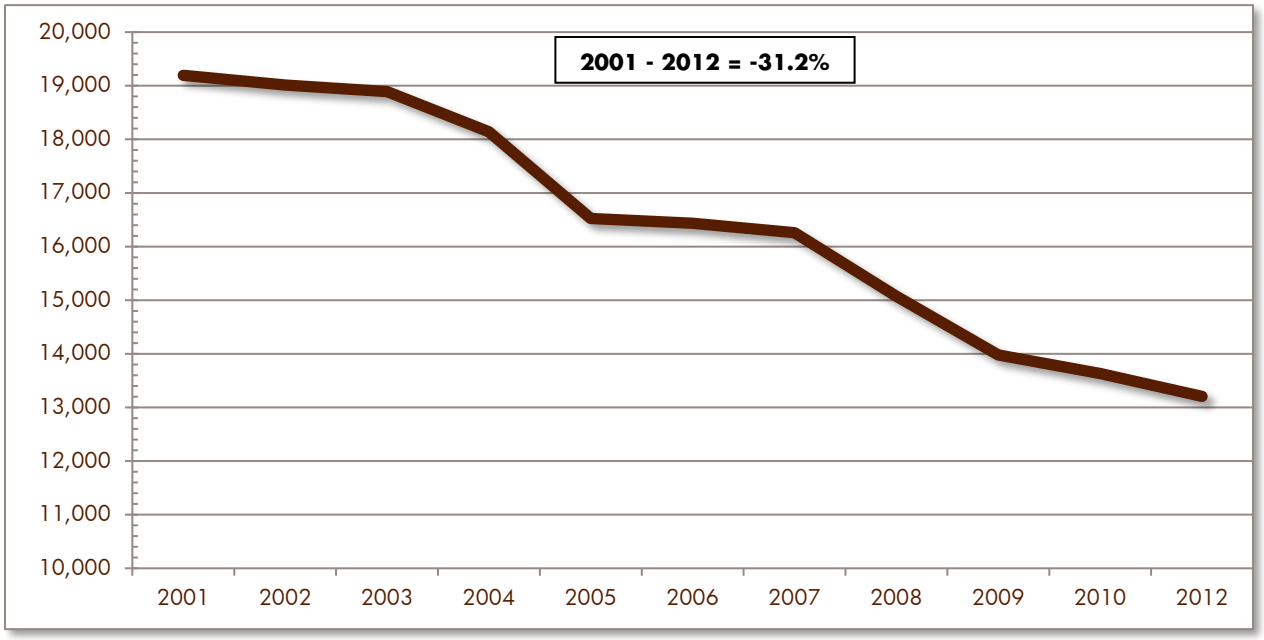
It is apparent from the activity data that different segments of the general aviation industry (nationally) are moving in different directions. For example, piston aircraft activity has been declining for more than a decade, pre-dating the recession of 2008-2010, particularly in terms of hours flown and fuel (100LL avgas) sold. In addition, the number of private and commercial pilots has also been declining. By contrast, corporate jets and turboprops have seen steady increases in the number of hours flown and active aircraft, although they did experience a drop between 2008-2010 due to the recession.

FIGURE 3-1 – NUMBER OF ACTIVE GA FIXED-WING AIRCRAFT IN THE UNITED STATES



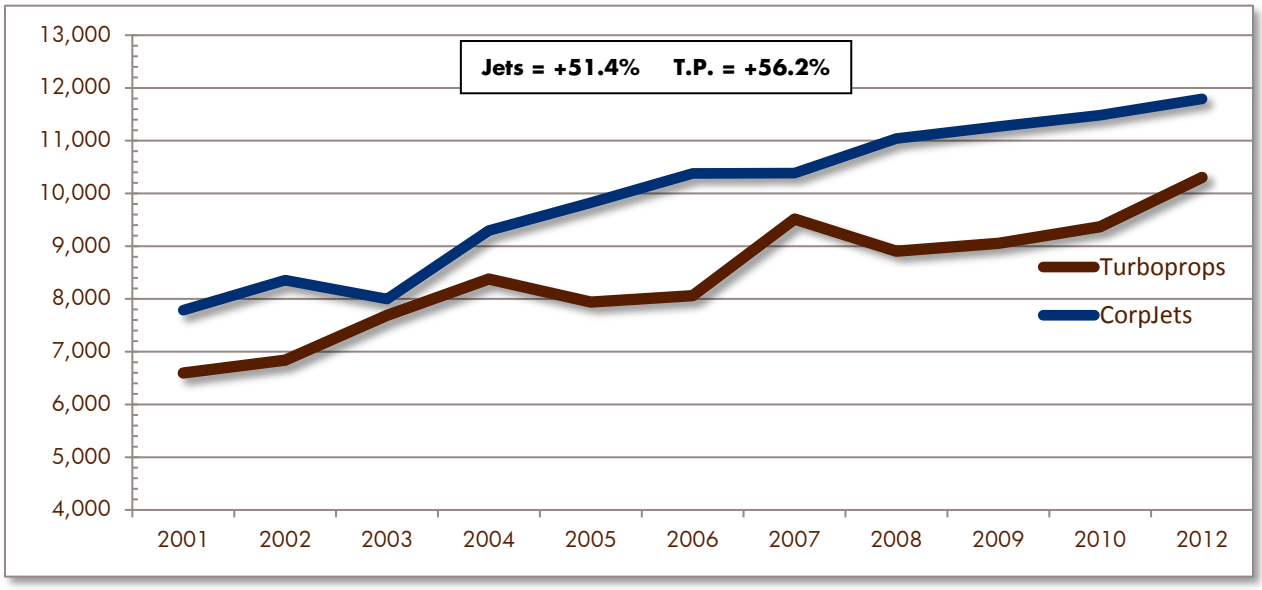
Source: FAA GA and Air Taxi Survey, 2012

FIGURE 3-2 – NUMBER OF HOURS FLOWN BY ALL PISTON AIRCRAFT IN THE UNITED STATES (X 1,000)



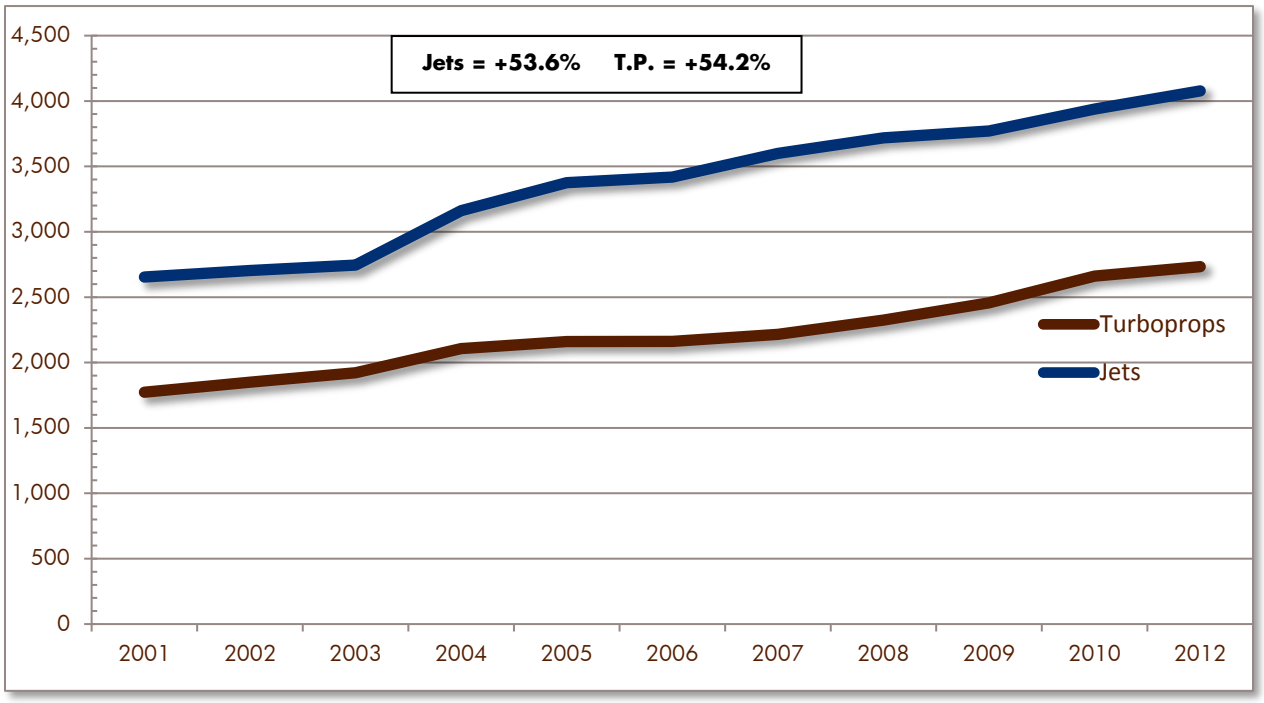
Source: FAA GA and Air Taxi Survey, 2012

FIGURE 3-3 – NUMBER OF ACTIVE TURBOPROPS & CORPORATE JETS IN THE UNITED STATES



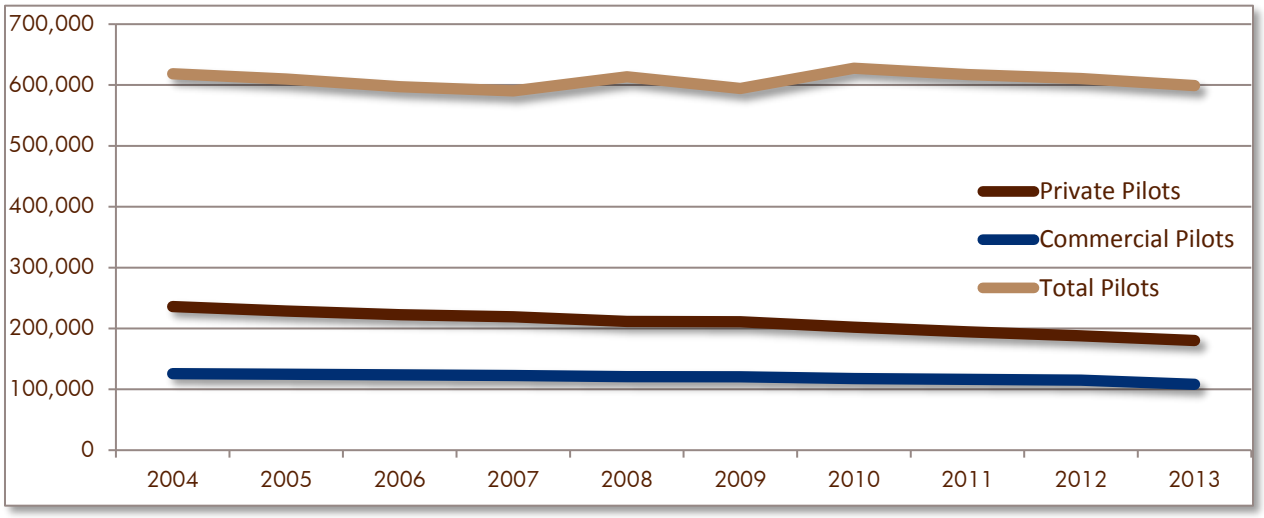
Source: FAA GA and Air Taxi Survey, 2012

FIGURE 3-4 – NUMBER OF HOURS FLOWN BY TURBOPROPS & JETS (X 1,000) IN THE UNITED STATES



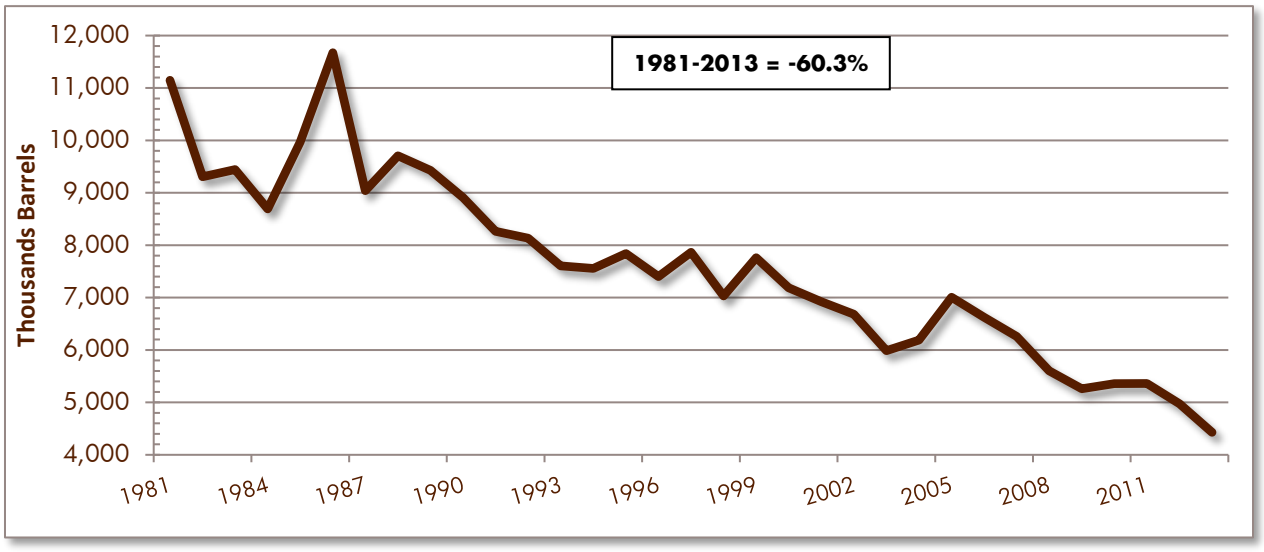
Source: FAA GA and Air Taxi Survey, 2012

FIGURE 3-5 – NUMBER OF PILOT CERTIFICATES BY TYPE IN THE UNITED STATES



Source: FAA GA and Air Taxi Survey, 2012

FIGURE 3-6 – AVIATION GASOLINE (100LL AVGAS) SUPPLIED (THOUSANDS BARRELS)



Source: U.S. Energy Information Agency (EIA)

Individual airport sponsors have little control over most of these national trends. However, as noted above, local positive trends can counterbalance some of the national challenges. Factors impacting GA activity are discussed below.

3.2.1 Fuel Price and Availability

Airports and their tenants operate in a competitive environment, and many GA aircraft operators are price sensitive. One area where competition between airports and Fixed Base Operators (FBOs) is having an impact is on fuel sales, particularly for Jet A. Many of the newer corporate aircraft have

large fuel capacities, very efficient engines, operate long range, and can tanker fuel. Thus, corporate operators regularly negotiate with FBOs for lower priced Jet A fuel (below the posted price). If the local FBO cannot match their desired price per gallon, operators will not buy fuel.

Many aircraft have sufficient reserves to fly to another airport and buy fuel at lower prices. A number of FBOs have reported that even as the number of corporate aircraft has increased, fuel sales have not kept pace, in part because of their ability to tanker fuel and buy wherever the price is lowest. That is expected to be a long term trend in corporate aviation. Since 2010 many airports have seen an increase in corporate aircraft activity, including KNB. In general, fuel sale volumes tend to track aircraft activity levels, but more in terms of general trends vs. specific numbers on a weekly, monthly, or annual basis. For example, the amount of Jet A fuel sold in gallons at KNB does not fluctuate exactly with the number of corporate aircraft operations, because fuel sales are determined by a variety of factors including the type of aircraft, the price of fuel at KNB, the specific mission being flown (non-stop range vs. mission fuel requirements), the amount of fuel needed for each trip, etc.

GA piston aircraft operators will also buy avgas at other airports with lower prices, as well as rent hangar storage and tie-downs depending on price. That puts pressure on airports to maintain competitive pricing even as their operating costs increase. A number of airports provide self-service fuel pumps at lower prices than full service, and also to make it available all of the time (24/7). Corporate aircraft generally prefer full service fueling. Full-service fueling increases overhead costs to airports and FBOs due to staffing, training, insurance, etc. As can be seen in **Table 3-3**, fuel prices at KNB are very competitive with other regional airports.

TABLE 3-3 – AVIATION FUEL PRICE COMPARISON

Airport / FBO	Distance from KNB (miles)	100LL	JET A
KKNB Kanab Municipal Airport/City		$5.09 (ss)	$4.65
KAZC Colorado City Municipal Airport/Escalade Air	23	$5.95 (fs)	$5.95
1L8 General Dick Stout Field Airport/Airport Quick Stop	38	$5.05 (ss)	$4.29
KBCE Bryce Canyon Airport/Airport FBO	46	$5.30 (fs)	$4.30
KSGU St George Regional Airport/Above View Jet Center	47	$5.09 (fs)	$5.09
KCDC Cedar City Regional Airport/ Sphere One Aviation	49	$4.99 (ss)	$4.75
KPGA Page Municipal Airport/ Classic Aviation, Lake Powell Jet Center, & American Aviation	52	$5.08 (fs)	$4.55
1L9 Parowan Airport/Parowan Aero Services	53	$5.22 (fs)	$4.91
Fuel Price Low – High / Average		$4.99-$5.95/ $5.22	$4.29-$5.95/ $4.81

Source: AirNav
Note: Lowest price available at each airport shown. Some airports with multiple FBOs sell fuel at higher price than shown. ss= self serve; fs = full service. Source: Airnav.com, December 2015.

The majority of aircraft piston engines use 100LL avgas. Some smaller displacement piston engines use unleaded auto fuel (that does not contain ethanol). The amount of 100LL avgas sold in the United States represents less than one quarter of one percent (approximately 0.14%) of the total fuel sold in the country, which makes it highly specialized for a small market (referred to in the oil industry as a boutique fuel). The amount of 100LL fuel sold in the United States has also been

declining steadily for more than 30 years (from approximately 11 million barrels per year in 1981 to four million barrels per year in 2013, a 60% decline).

The availability of 100LL is also decreasing (and disappearing), particularly in many places outside of the United States, which further decreases overall demand. Many large GA aircraft manufacturers are re-equipping their piston engine airplanes with diesel engines that use Jet A, further reducing demand for 100LL avgas. 100LL is the only fuel that contains tetraethyl lead (TEL), a toxic substance used to prevent engine knocking (detonation). Environmental groups have petitioned the U.S. EPA to eliminate the grandfather clause allowing 100LL, and the EPA has been studying the proposals. In addition, there is only one source of TEL that is added to avgas, and the producer is based in the United Kingdom. All of those factors have driven up the price of avgas. Although aviation fuel prices have declined over the last year, as of December 2015 100LL avgas averaged $5.14 per gallon in the Western United States, compared to $4.55 per gallon for Jet A, and to $2.06 per gallon for regular unleaded auto gas.

If avgas 100LL supplies were to diminish significantly, or if avgas prices were to rise significantly, or if 100LL were no longer available, GA activity would decline significantly. Some aircraft with smaller piston engines (i.e. less than 360 cubic inch) have been approved by the FAA to use auto gas without ethanol. However, aircraft with larger piston engines (such as the Cessna 402, Cirrus SR-22, Beech Baron and Bonanza, Piper Seneca, Matrix and Malibu, for example)—which also use the largest amount of 100LL—cannot use any unleaded auto fuel, or fuel with less than 100 octane.

At present there is no replacement for 100LL avgas that will work in all piston engines, although some industry analysts are optimistic such a replacement can be found. FAA has sponsored studies to find replacement fuels and has shortlisted three different unleaded fuels for detailed testing and evaluation. If a replacement fuel for 100LL is found, the key questions will then be: what will the retail price at the pump be for the replacement fuel? If the replacement fuel is priced significantly higher than the retail price for avgas then overall GA activity will likely decline even if replacement fuel is readily available. Secondly, will the replacement fuel be fully compatible with the existing fuel storage tanks used for 100LL? If not, it is possible that many FBOs and airports could not make the investment needed for new fuel storage tanks.

3.2.2 Airport and Airspace Security Regulations

After the terrorist attacks on New York and Washington DC on 9/11/2001, the U.S. Congress created the Transportation Security Administration (TSA) as part of the Department of Homeland Security, and imposed new airport and airspace regulations. Most new airport security regulations apply to airports with airline service. Thus, GA airports such as KNB have not been encumbered by the same security regulations as commercial airports such as Salt Lake City or Las Vegas. However, many GA airports have implemented security measures such as full perimeter fencing, video monitoring, and electronic gate access.

A recent in-depth study on GA activity conducted by MIT[1] included an extensive survey of GA pilots across the United States, and the MIT study noted: “Post-9/11 security changes were selected

[1] Source: MIT International Center for Air Transportation, Current and Historical Trends in General Aviation in the U.S., August 2012, Report ICAT-2012-6

by approximately half the participants of having a real negative impact on their flying, indicating that a portion of the post- 9/11 trend downwards in operations may be a persisting, rather than transient, force."

Temporary Flight Restrictions (TFRs) impose a combination of no-fly areas as well as designated areas for transient flights with strict conditions imposed. The imposition of TFRs reduces GA activity within a 50+ mile radius. The National Business Aircraft Association (NBAA) noted: "TFRs do have a significant restrictive impact on general and business aviation." The reduced activity levels under and adjacent to TFRs have adversely impacted many FBOs and other GA businesses. Airport managers and state aeronautic agencies have no discretion or input about when TFRs are imposed or how long they remain in effect. GA activity is very dependent on convenience—the ability to fly when demand warrants. If Congress were to impose additional airport or airspace security procedures targeted specifically at general aviation, as has been proposed in recent years, such as the proposed large aircraft security rule, the new rules would result in higher costs, less convenience, and reduced GA activity.

3.2.3 Cost of Aircraft Ownership and Operation

Costs associated with owning and maintaining aircraft have been rising faster than the overall rate of inflation for many years. A new Cessna 172, a four-seat, single-engine piston aircraft used for training, currently retails for almost $400,000. A number of high-performance four-seat, single-engine piston airplanes retail for $700,000 to $1 million (e.g. Cirrus SR-22 GTS, Cessna TT, Piper Malibu and Matrix, and the Beech G36). As a result, many airplane owners continue to fly used aircraft, the average age of a GA aircraft in the United States is more than 40 years old; subsequently, maintenance costs and replacement parts are high and rising. Because a high percentage of GA flying is conducted for personal/recreational purposes, rising aircraft ownership costs have decreased overall activity.

3.2.4 Pilot Population Demographics

The U.S. pilot population has been declining for years. According to the FAA, between 2004 and 2013 the number of total licensed pilots declined 3.2%. Licensed private pilots have declined 23.6% and commercial pilots dropped 11.7% over that period. Congress recently mandated that the FAA change the requirements for pilots holding an Airline Transport Pilot (ATP) License. This requires pilots to have a minimum of 1,500 hours logged flight time plus additional provisions before being hired with any airline. Some regional carriers have stated that requirement has already impacted their ability to hire qualified pilots and have reduced their schedule because of a shortage of pilots.

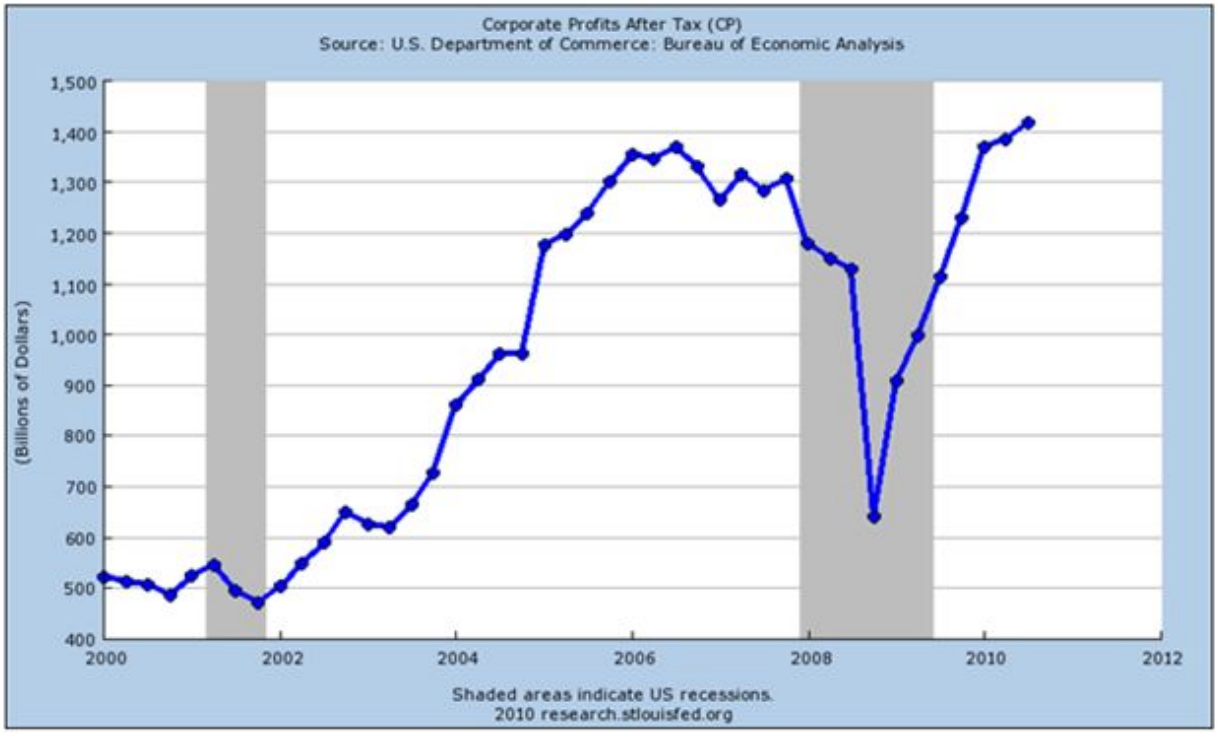
Analysts have said that the rule change would decrease the number of student pilots who had originally intended to become airline pilots but cannot afford the time or cost to meet the new standards. Also, the military has been reducing their pilot training pipeline and have been offering more incentives to retain rated pilots, while rapidly shifting their training focus to operators of remotely piloted vehicles (RPVs). Many commercial and military pilots also fly general aviation aircraft, and declines in airline and military pilots affect GA activity.

The pilot population is aging faster than the population as a whole. Between 1990 and 2010 the average age of U.S. pilots increased from 40.5 to 44.2 years old, and the average age of private pilots is currently 48.5 years old. By comparison, the median age of the U.S. population is 37.2 years old according to the U.S. Census Bureau. While private pilots do not have a mandatory retirement age, the amount of flying decreases as they age, as well as increasing difficulty meeting FAA medical standards. Barriers to attract younger pilots include the high cost of flight training, the uncertainty of the aviation industry as a career path, the military's shrinking pilot training, combined with rapidly growing interest in RPVs that require less training and cost less than airplanes.

3.2.5 Economic Trends

National economic trends affect GA activity on the local level. The economic recession that occurred between late 2007 and 2010 significantly depressed corporate aviation and impacted piston-engine activity throughout the United States and internationally. The decline in corporate aviation over that period clearly illustrated the very close correlation between corporate aircraft activity and the stock market and corporate profits. KNB accommodates corporate aircraft, which fly into the airport for business and recreation. Both the stock market and corporate profits have been rising steadily since late 2010, like corporate aviation activity (**Figure 3-7**).

FIGURE 3-7 – CORPORATE PROFITS AFTER TAXES

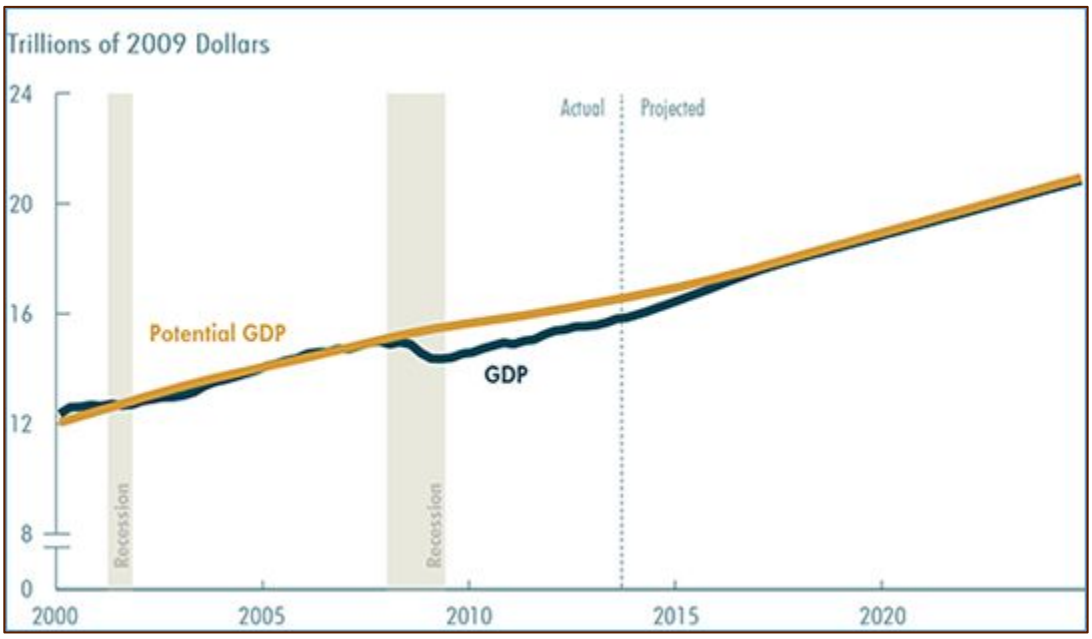


Source: U.S. Department of Commerce, BEA

The Congressional Budget Office (CBO) assessment of the U.S. economy in 2014 noted: "After a frustratingly slow recovery from the severe recession of 2007 to 2009, the economy will grow at a solid pace in 2014 and for the next few years."

Longer term, however, the CBO is less optimistic: "Beyond 2017, CBO expects that economic growth will diminish to a pace that is well below the average seen over the past several decades." That projected slowdown mainly reflects long-term trends—particularly slower growth in the labor force because of the aging of the population. The FAA, as well as a number of private companies are optimistic about the long-term growth potential for corporate aviation. For example, Honeywell's Global Business Aviation Forecast sees four to five percent average annual industry growth over next decade. Up to 9,250 deliveries of new business jets valued at over $250 billion are expected through 2023. Operators plan to replace 28 percent of their fleets with new jets in the next five years. And large-cabin jets account for more than 55 percent of new purchases.

FIGURE 3-8 – U.S. GDP & POTENTIAL GDP



Source: Congressional Budget Office (CBO)

Honeywell's forecast goes on to say, "Shifting from jet purchases to flight activity, over the course of the past year the pace of recovery has been mixed. Much of the ground lost by corporate aircraft operations during the 2009 recession still remains to be recaptured, but modest improvements in international flight activity and in United States operations in general have been seen in recent months."

3.3 Historical Aviation Activity

As noted previously, KNB does not have a control tower, so activity levels are estimated as opposed to actual traffic counts[1]. The FAA's Terminal Area (TAF) estimated historical operations and based aircraft at the KNB (**Figure 3-9** and **Figure 3-10**). The estimates were developed based on

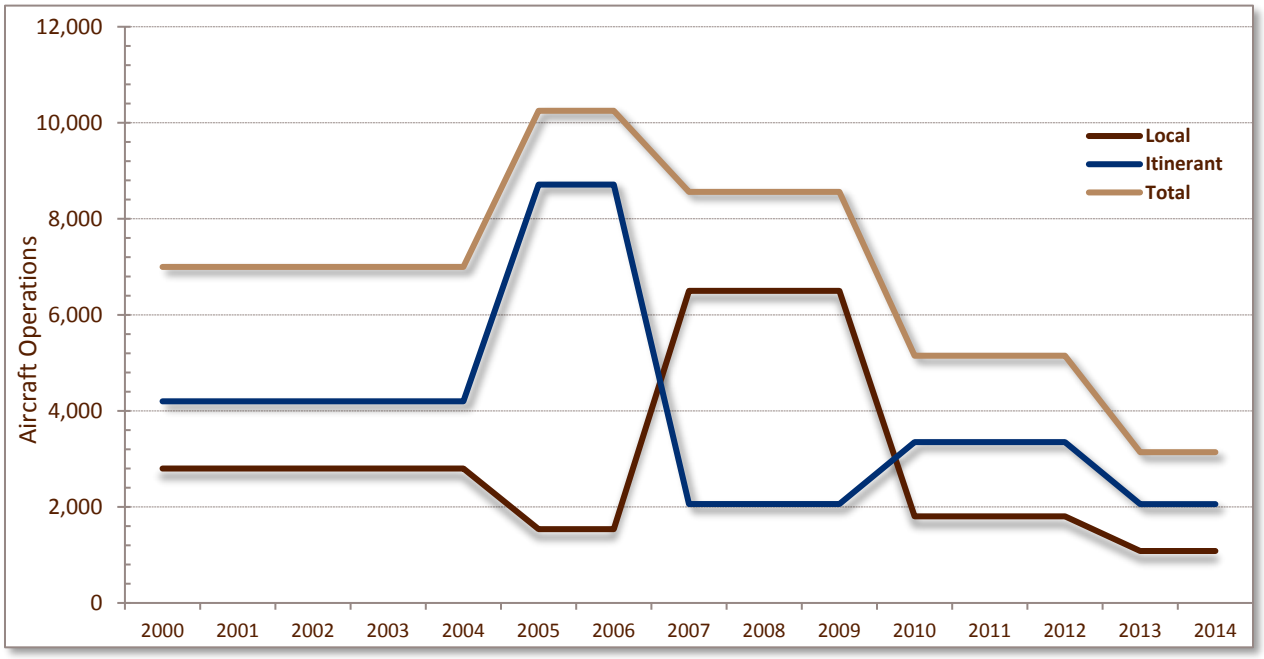
[1] Both acoustical and video monitors have been used to count activity at non-towered airports. The Airport Cooperative Research Program (ACRP) has sponsored studies of the various counters, including their cost and reliability. Aircraft activity data generated by acoustical and/or video monitors are useful in validating activity estimates compiled from a variety of sources such as FAA's Form 5010, previous airport master plans, airport tenants, etc.

discussions with the airport manager, and other planning studies such as the State Airport System Plan and previous airport master plan.

The FAA estimated that activity levels at KNB fluctuated considerably between 2000 and 2014, but does not explain why such variations occurred over that period. Recent discussions with airport management indicate that activity levels in 2015 appear to be close to FAA's estimate of approximately 3,000 operations per year, or nine takeoffs and landings per day.

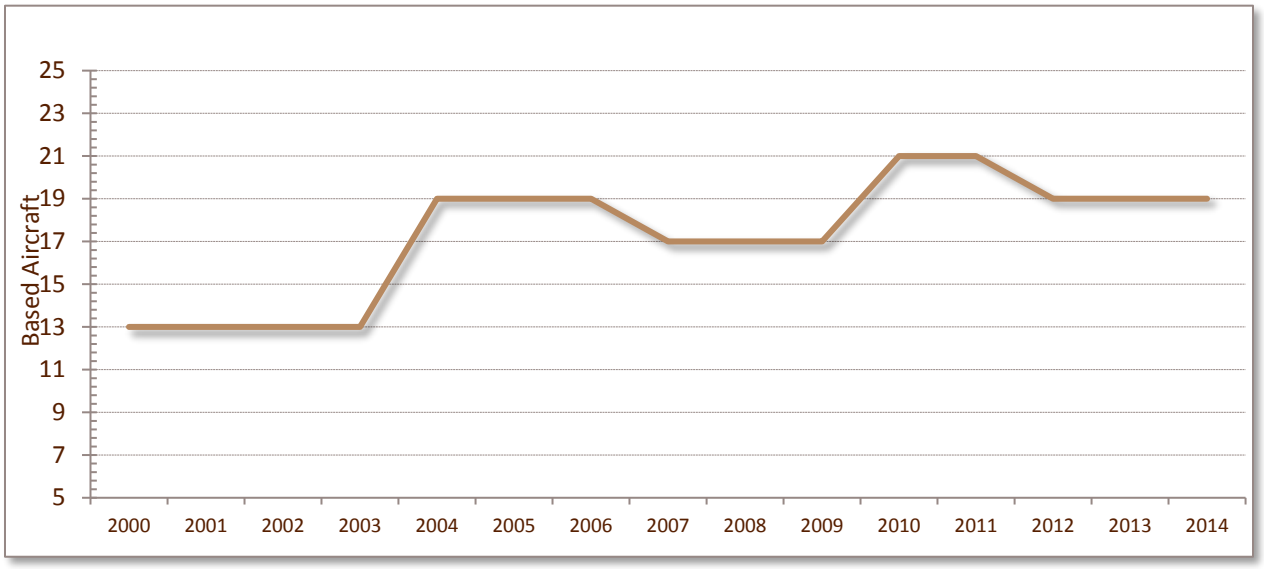
Typically, large changes in activity levels are caused by events such as an FBO opening or closing, a runway closed for a period for reconstruction, the basing of a new corporate flight department at the airport, construction or demolition of T-hangars or community hangars, etc. However, those events do not appear to be the case at KNB.

FIGURE 3-9 – HISTORIC AIRCRAFT OPERATIONS - KNB



Source: FAA Terminal Area Forecast (TAF)

FIGURE 3-10 – BASED AIRCRAFT AT KNB



Source: FAA Terminal Area Forecast (TAF)

The 2002 Airport Master Plan estimated that historical activity levels at KNB were approximately 9,500 operations per year, or 26 takeoffs and landings each day (**Table 3-4**). That is consistent with FAA's estimate of activity for the same period. The 2007 Utah Continuous Airport System Plan estimated that activity at KNB was approximately 7,000 operations per year in 2004 and 2005 (**Table 3-5**).

TABLE 3-4 – HISTORIC OPERATIONS AT KNB

Year	GA Aviation Operations
1997	9,360
1998	9,410
1999	9,470
2000	9,540
2001	9,620

Sources: KNB Master Plan, 2002; UDOT Records; KNB Management

TABLE 3-5 – LOCAL AND ITINERANT OPERATIONS - KNB

Year	GA Operations		
	Local	Itinerant	Total
2004	4,161	2,829	7,040
2005	4,307	2,930	7,286

Source: UDOT Continuous Airport System Plan, 2007

The State's Airport System Plan estimated less activity than FAA's Terminal Area Forecast in 2005, but the State's estimated activity represented a downward trend from the late 1990s and early 2000s. FAA estimated that the downward trend in activity occurred after 2006/2007 (**Figure 3-11**).

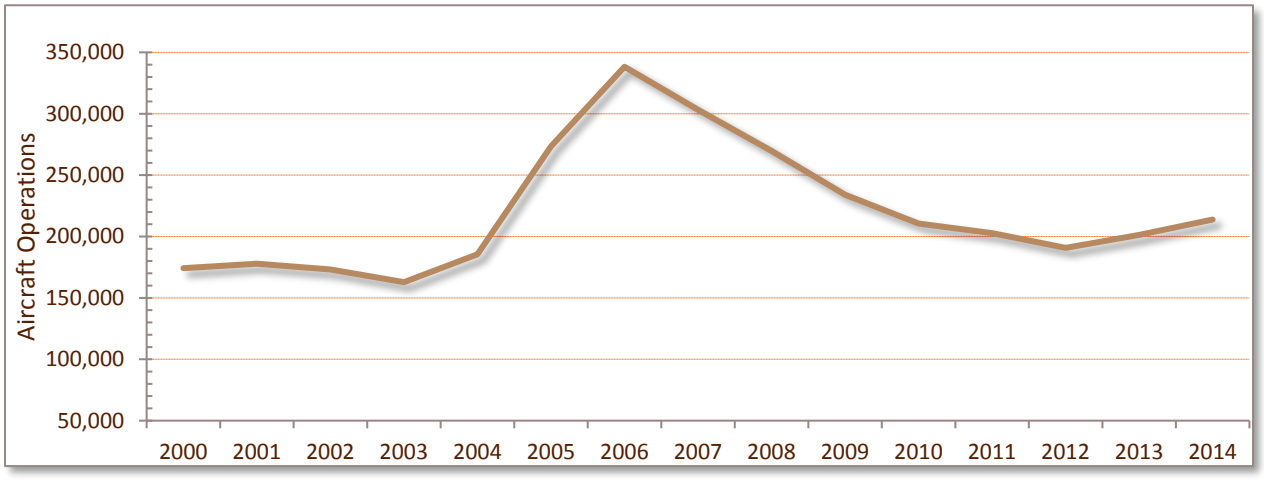
FIGURE 3-11 – KNB AIRCRAFT OPERATIONS - 1997-2013

Sources: 2002 AMP = KNB Master Plan, 2002/2004: UDOT SASP = Utah Department of Transportation State Airport System Plan, 2007; FAA TAF = FAA Terminal Area Forecast, Jan. 2015

General aviation aircraft operations at towered airports in Utah experienced a decline between 2006 and 2012, with a slight upturn in CY 2013 and 2014 (**Figure 3-12**). The GA activity counts include corporate aircraft as well as piston engine airplanes.

Between the peak periods in 2006 and 2013, GA aircraft operations at towered airports in Utah declined by 40.5%, with local (training) operations declining by 48.3%. Those trends in GA operations are consistent with towered airports in other states, and nationally as well. The decline in activity estimated at KNB is consistent with trends seen throughout Utah, and the region.

FIGURE 3-12 – GA AIRCRAFT OPERATIONS - UTAH TOWERED AIRPORTS, 2000-2014



Source: FAA Air Traffic Activity Data System

3.4 Current Aviation Activity at KNB

The KNB Airport Manager provided estimates of activity for 2015, as shown in **Table 3-6**. Based on the data available it is not possible to annualize the operations counts. The manager noted that the counts are based on part-time observation, four days per week. The observations included:

- 50 pilots used the courtesy car.
- 16 based aircraft, including one helicopter.
- Hangars off-airport may have airplanes that use KNB.
- Fuel sales first FY 2016 higher than all CY 2015.

TABLE 3-6 – RUNWAY EVENTS AT KNB
6/1/15 - 12/31/15

Month	Prop	Jet	Heli
June	57	11	30
July	39	16	33
August	27	12	35
September	94	16	31
October	45	19	40
November	28	12	40
December	27	10	20
Total	**317**	**96**	**229**

Source: KNB Airport Manager

The FAA's Airport Master Record Form 5010 and Terminal Area Forecast estimate that in 2014 and 2015 there were 3,140 annual aircraft operations, or an average of nine takeoffs and landings per day at KNB. The FAA also estimates there are 20 based aircraft at KNB; 18 single engine pistons and two multi-engine. The FAA typically updates their records based on information provided by the Airport Manager. The number of based aircraft at every airport fluctuates over time, and there are also different definitions of what constitutes a based aircraft based on how long it is parked at a specific airport. As a result, different sources often provide different estimates of the number of based aircraft at a specific airport depending on their time frame and definition of based aircraft.

TABLE 3-7 – 2014 KNB BASED AIRCRAFT

Aircraft Type	Amount
Single Engine (SE)	18
Multi Engine (ME)	2
Jet (J)	0
TOTAL FIXED WING (SE + ME + J)	**20**
Helicopters	0
Gliders	0
Military	0
Ultra-Light	0

Sources: FAA's Airport Master Record Form 5010 and Terminal Area Forecast

TABLE 3-8 – OPERATIONS FOR 12 MONTHS ENDING 01/01/2012

Aircraft type	Amount
Air Carrier	0
Air Taxi	100
General Aviation Local	1,082
General Aviation Itinerant	1,958
Military	0
Total Operations	**3,140**

Source: FAA Airport Master Record, Form 5010

The FAA and private flight tracking companies such as FlightAware, Passur, and GCR download data from flight plans filed by aircraft operators with FAA. That data indicates that there were approximately 26 operations by business jets and turboprops in CY 2014 at KNB. The aircraft include turboprops such as the Beech King Air and Pilatus PC-12, as well as jets; the Cessna Citation, Raytheon Premier, Astra SPX, Lear 45, etc. The companies that flew aircraft into KNB are shown in **Table 3-9**. The information was compiled from aircraft registration data and flight plans maintained by the FAA.

TABLE 3-9 – COMPANIES THAT FLEW INTO KNB

Company Names			
AVN Air	RR and D Ltd.	Whiskey Tango LLC	Tenax Aviation Services LLC
Raging River Management	Empire LLC	M&J Leisure	McCoy Corportation
Flax Services Corp.	DBS Air LLC	MetAir	CTE II LLC
Keeton Riemen Schneider	Aero Film	GBB (Hawaii)	HFP LLC
Southern California Piper	State of Utah	Smithfield Foods	
Mango Air Inc.	Strongwell Corp.	Management Company Holdings	

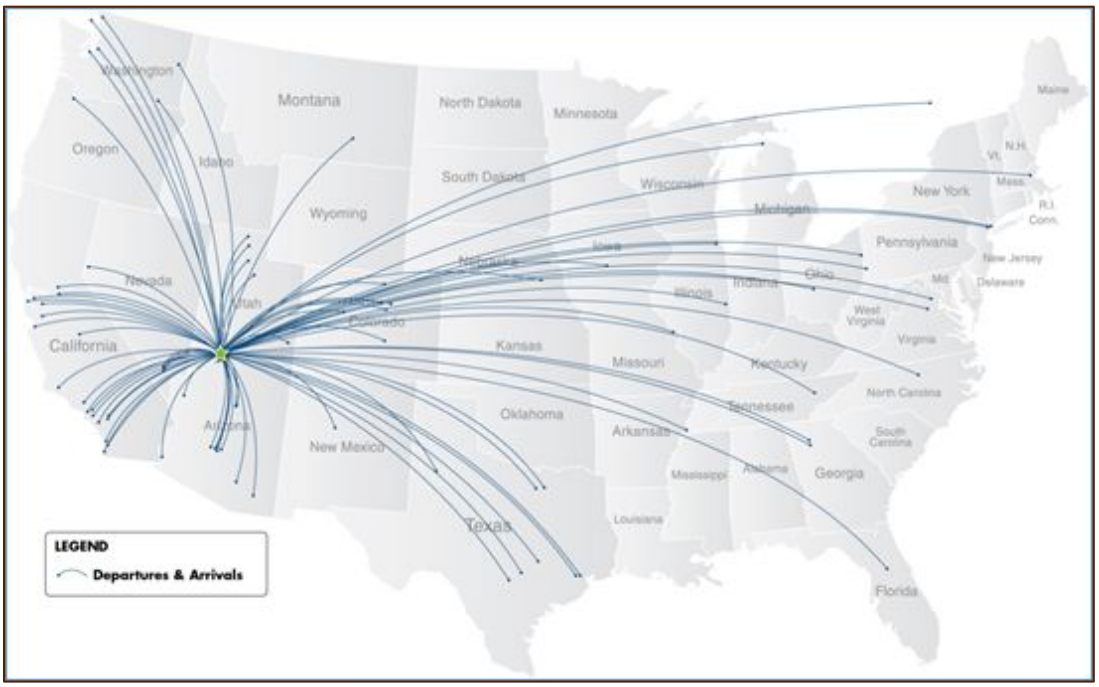
Source: FAA and GCR, Inc.

The number of turboprop and corporate jet operations at KNB are well below FAA's threshold for determining airport design standards. As noted in FAA Order 5090.3C, *Field Formulation of the National Plan of Integrated Airport Systems*, Chapter 3: "Airport dimensional standards (such as runway length and width, separation standards, surface gradients, etc.) should be selected which are appropriate for the critical aircraft that will make substantial use of the airport in the planning period. Substantial use means either 500 or more annual itinerant operations, or scheduled commercial service.

The critical aircraft may be a single aircraft or a composite of the most demanding characteristics of several aircraft. The critical aircraft (or composite aircraft) is used to identify the appropriate Airport Reference Code for airport design criteria."

Based on the flight plan data for CY 2014, which includes origins and destinations, corporate and business aircraft fly throughout the country to and from KNB (**Figure 3-13).** The fact that aircraft can fly non-stop to the East Coast from KNB, as well as the Pacific Northwest, indicates that the existing runway length (6,193 feet) does not significantly constrain aircraft operations.

FIGURE 3-13 – NON-STOP FLIGHTS TO/FROM KNB, CY 2014



Source: GCR and FAA

3.4.1 Critical Design Aircraft & Airport Reference Code (ARC)

Based on the various sources of activity data, and FAA's definition of substantial use (i.e. a minimum of 500 itinerant operations per year), the current Airport Reference Code (ARC) for KNB is B-II. The majority of operations are conducted by single-engine piston airplanes, followed by multi-engine airplanes, turboprops such as Beech King Airs and PC-12s, and small corporate jets such as Cessna Citations. KNB can accommodate the occasional operations conducted by mid- or large-size corporate jets such as the Gulfstream G-IV/450, Hawker 800, Falcon 2000, Challenger 300, etc.

The FAA classifies airports in the United States with a coding system known as the Airport Reference Code (ARC). This classification helps apply design criteria appropriate to operational and physical characteristics of the aircraft types operating at each airport. The design standards are presented in various FAA advisory circulars, primarily in FAA AC 150/5300-13A, *Airport Design*.[1]

The ARC is made up of two separate components: the Aircraft Approach Category (AAC) and the Airplane Design Group (ADG). The approach category for an airport is determined by the approach speed of the fastest aircraft that operates at the Airport at least 500 times per year, with Category A being the slowest approach speed and E being the fastest. Approach Categories are summarized in **Table 3-10**.

[1] FAA, AC 150/5300-13A, *Airport Design*, Sept. 2013.

TABLE 3-10 – AIRCRAFT APPROACH CATEGORY

Approach Category	Approach Speed
Category A	Speed less than 91 knots
Category B	Speed 91 knots or more but less than 121 knots
Category C	Speed 121 knots or more but less than 141 knots
Category D	Speed 141 knots or more but less than 166 knots
Category E	Speed 166 knots or more

KNB Airport

Source: FAA AC 15/5300-13A, Airport Design

The ADG is a numerical classification of aircraft based on wingspan and tail height. If an airplane's wingspan and tail height is in two categories, the most demanding category is used. Similar to the approach category, the ADG for an airport is determined by the largest aircraft operating at least 500 times per year at the airport. ADG classifications are summarized in Table 3-11.

TABLE 3-11 – AIRPLANE DESIGN GROUP (ADG)

Group #	Tail Height (ft)	Wingspan
I	<20	<49
II	20≤30	49≤79
III	30≤45	79≤118
IV	45≤60	118≤171
V	60≤66	171≤214
VI	66≤80	214≤262

KNB Airport

Source: FAA AC 15/5300-13A, Airport Design

3.4.2 Runway Design Code (RDC)

The RDC is specific to each runway at each airport. The most critical aircraft which uses a runway at least 500 times per year is used to determine the RDC. The RDC uses the same AAC, and ADG criteria utilized to determine the ARC, but adds a visibility minimums component. The current RDC for Runway 1-19 at KNB is B-II-5000. The reference to 5000 in the RDC is related to approach visibility minimums.

3.4.3 Taxiway Design Group (TDG)

Taxiways are designed using the Airplane Design Group and the Taxiway Design Group. The Main Gear Width (MGW) and the Cockpit to Main Gear Distance (CMG) to determine the TDG for each taxiway. The current taxiway design criteria for KNB is TDG-1A, which can accommodate a maximum gear width of 15 feet and cockpit to main gear distance of 20 feet. That encompasses ARC B-I and most B-II aircraft. The existing taxiways at KNB meet FAA's criteria for TDG-1A aircraft.

FIGURE 3-14 – FAA AIRPORT REFERENCE CODES (ARC) & AIRCRAFT

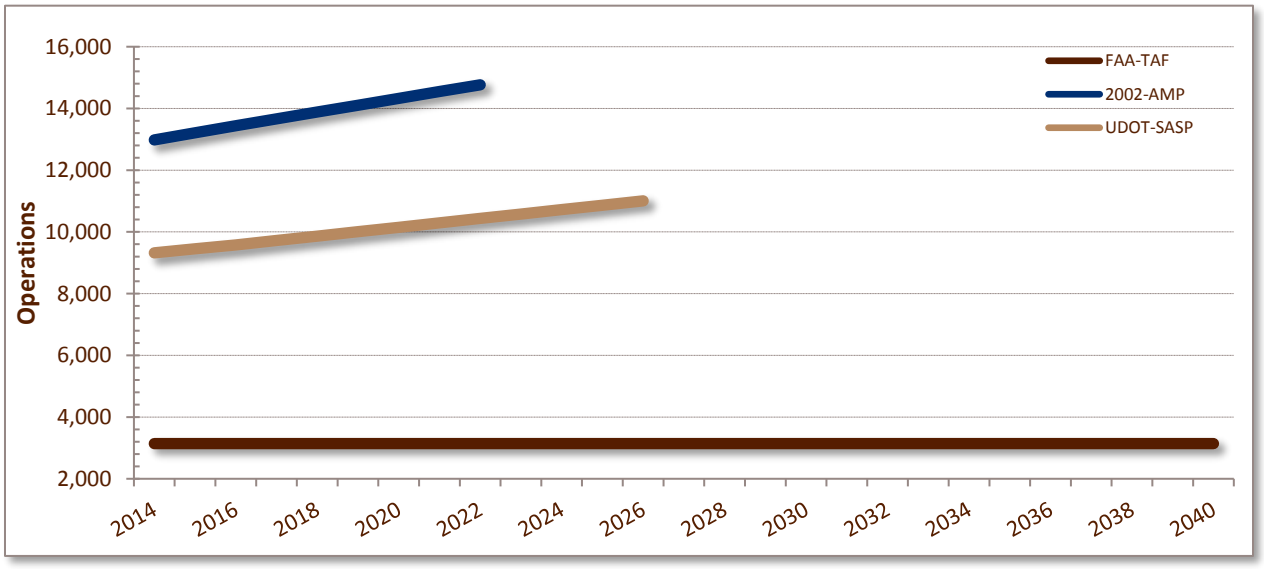
Source: Jviation

3.5 Previous Aviation Activity Projections

Previous forecasts of aviation activity prepared for KNB were examined in this chapter to identify a potential range of activity in the future, and also to compare against recent trends. In addition, recent historic trends in activity as well as certain external factors (discussed previously in the forecast scenarios) were evaluated in developing new forecasts for this Master Plan. The previous forecasts were based on higher historical estimated traffic levels compared to current trends.

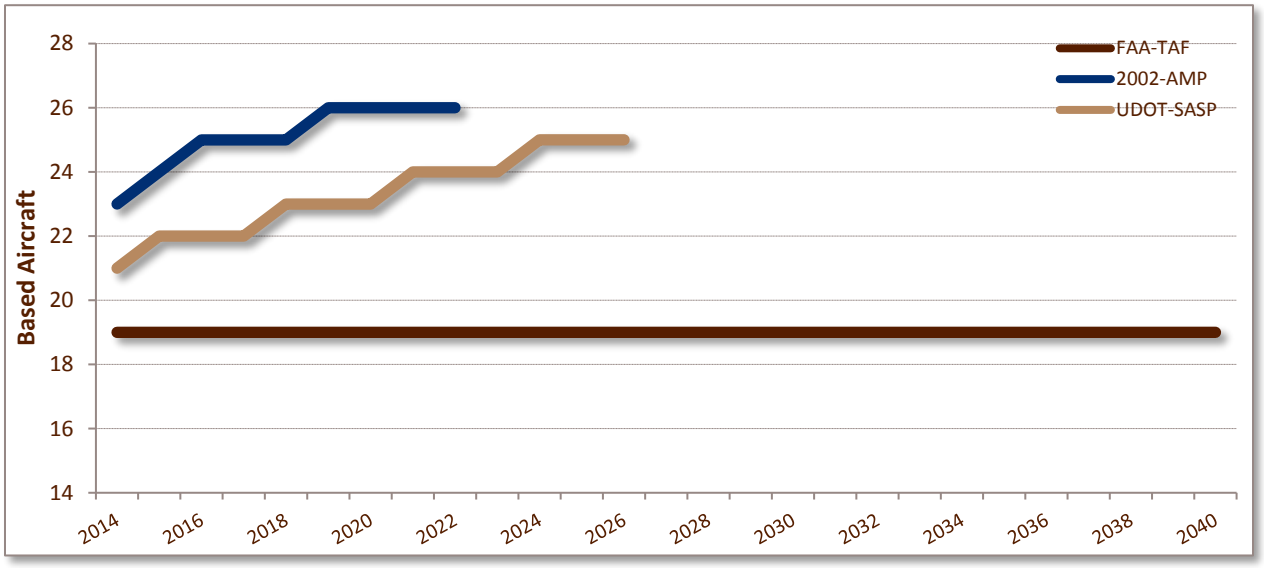
Three different sources forecasted aviation activity at KNB previously; the FAA's TAF issued January 2015; the Airport Master Plan prepared in 2002; and the Utah State Airport System Plan prepared in 2007. Each forecast was prepared in different periods and started with different base year data (**Figure 3-15** and **Figure 3-16**).

FIGURE 3-15 – PREVIOUS AIRCRAFT OPERATIONS FORECASTS - KNB



Source: FAA's Terminal Area Forecast (TAF) issued January 2015; the Airport Master Plan prepared in 2002; and the Utah State Airport System Plan prepared in 2007

FIGURE 3-16 – PREVIOUS BASED AIRCRAFT FORECASTS - KNB



Source: FAA's Terminal Area Forecast (TAF) issued January 2015; the Airport Master Plan prepared in 2002; and the Utah State Airport System Plan prepared in 2007

The 2002 Master Plan was the most optimistic of the three sources in terms of future activity, in part because activity was at higher levels when that master plan was prepared. In addition, trends prior to that master plan were indicating potentially strong growth at KNB. The most recent FAA TAF, issued in January 2015, projected no growth in aircraft operations or based aircraft through

2040. The FAA provided no specific reasons why they anticipate no growth in activity, but this FAA approach is typical for small airports like KNB.

3.6 Activity Forecast Periods

The FAA recommends that forecasts for airport master plans extend for a period of twenty years. The forecasts for KNB are divided into three periods:

- Short Term: 2016-2020
- Medium Term: 2021-2025
- Long Range: 2026-2035

The short term planning period has the highest confidence level in terms of future activity. By 2020 and beyond, an increasing number of external events may occur that could affect aviation activity at KNB, such as those discussed in earlier sections of this chapter. At many airports, for example, corporate activity has not returned to the levels experienced in 2005-2007, prior to the start of the economic recession that depressed corporate and GA activity. The continued steady growth of the stock market and corporate profits will be key factors to the long-term growth of corporate aviation activity, but economic conditions are subject to significant changes.

It is recommended that actual activity levels at KNB be compared against the forecasts on an annual basis to determine if the assumptions used remain valid and the growth rate matches the forecasted levels. If differences between the forecasts and actual operations are noted in the future, facility requirements should be re-examined.

3.7 Forecast Scenarios for KNB

Based on all of the factors and variables discussed above, three forecast scenarios were developed in an effort to capture the range of possible activity at KNB:

Forecast Scenario 1 – Growth: This scenario assumed that the cost of aircraft ownership and operation, including fuel prices, will not increase any faster than the overall rate of inflation; that the economy in the City of Kanab and Kane County will grow steadily throughout the forecast period, including population, employment and per capita income; and that demand for pilots by the airlines, private companies, and government agencies will continue to increase. This scenario also assumed that second home owners and area visitors will continue to fly into KNB, and that a full-time flight school would be located at KNB, which would generate both local and transient operations. In this scenario, aircraft activity and based aircraft would grow at approximately 1.7% per year through 2035.

Forecast Scenario 2 – No Growth: This scenario assumed that current trends will continue, namely that the cost of aircraft ownership and operation will continue to fluctuate, occasionally rising faster than the overall rate of inflation; the local economy will grow steadily; there will be no full-time flight school located at the Airport; demand for professional pilots will fluctuate; second home owners and visitors will continue to fly into KNB, but not increase significantly, and the

overall size of the pilot population will hold steady. In this scenario, aircraft activity and based aircraft will remain at current levels through 2035.

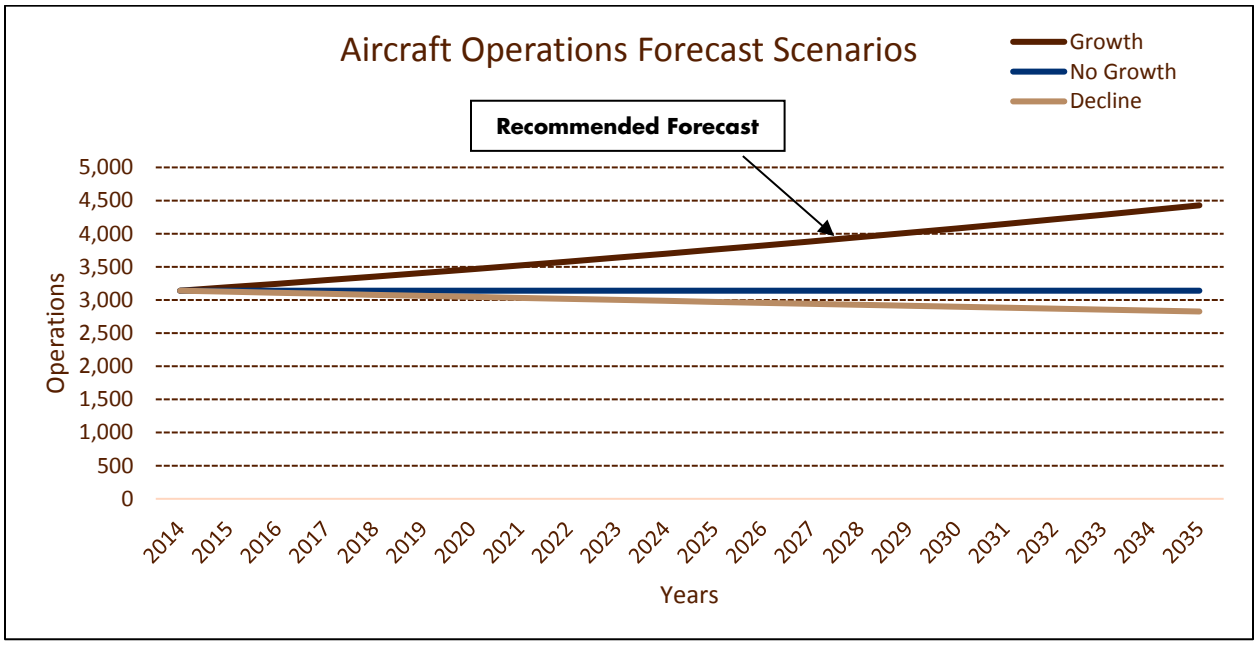
Forecast Scenario 3 – Decline: This scenario assumed that the cost of aircraft ownership and operation will increase faster than the overall rate of inflation, including the price of aviation fuel; second home owners and visitors flying into KNB will decrease; 100LL avgas, used in piston aircraft engines will become scarce, a drop-in replacement fuel will not become available at the same cost as existing 100LL avgas; the local economy will not grow as rapidly as projected; the number of active pilots will continue to decline; and no new operators will locate at the Airport to offer new services such as flight instruction, aircraft rental, charters, etc. In this scenario, aircraft activity would decline at 0.5% per year throughout the forecast period.

3.8 Preferred Aircraft Activity Projection

There are both positive and negative influences that have affected aviation activity at KNB, and the GA industry over the last 10 to 15 years. And as discussed in this chapter, those trends may continue throughout the forecast period. It is difficult to predict future trends, such as economic conditions locally, regionally, and nationally, as well aviation factors such as the cost of aircraft ownership and operation, and the long-term future of 100LL avgas. Based on the assumption that the forces acting on general aviation activity in the future will be reasonably balanced, and the proactive economic development program undertaken by the City of Kanab will be successful, the Growth Scenario appears to be the most reasonable.

There are risks to the forecast. For example, it is possible that aviation fuel prices may rise faster than predicted, as well as the overall cost of aircraft ownership, and that new security regulations may be imposed on general aviation airports, as well as airspace. It is important, therefore, to monitor the forecasts and the underlying assumptions against actual activity and events on regular basis, at a minimum annually, and adjust the forecasts and resulting facility requirements if conditions change substantially from what was anticipated.

FIGURE 3-17 – AIRCRAFT OPERATIONS FORECAST SCENARIOS - KNB



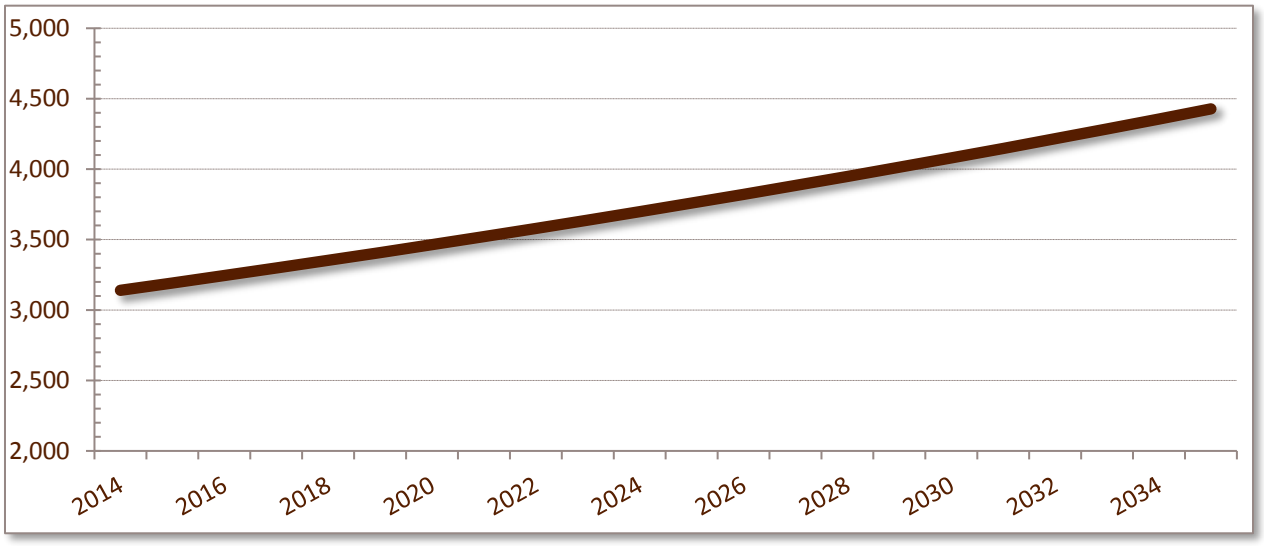
Source: Jviation. Note: Growth = 1.7% per year growth rate. No Growth (recommended) = 0% growth rate. Decline = -0.5% per year.

3.8.1 Recommended Forecast Rationale

Scenario 1 Growth is the likeliest of the three scenarios to occur at KNB, for the following reasons:

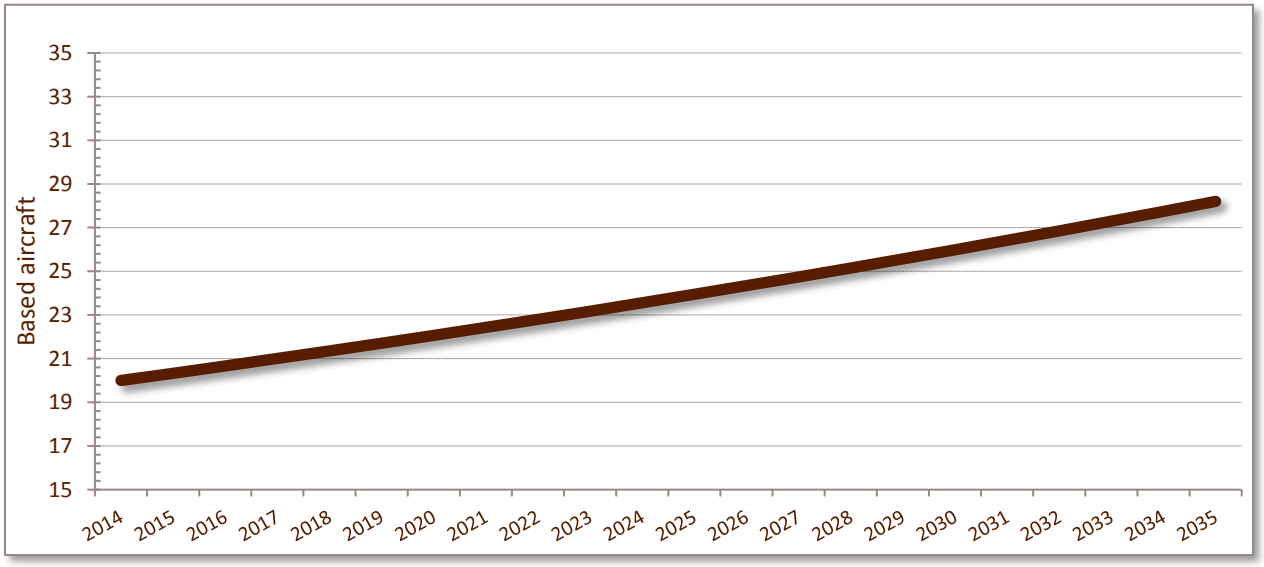
- It represents a balanced approach in terms of rising costs of aircraft ownership and operation, the growth of the local economy, and external factors such as demand for professional pilots, availability of 100LL avgas, etc. The recommended forecast is shown in **Figure 3-1**8 is within reasonable tolerances from the FAA's TAF.
- Scenario 1 anticipates that the local economy will continue to expand, although it does not assume any significant change to the economy (e.g. no significant shift in industry types, employers, or rapid growth in urbanization), and the local demographics will not change significantly. Tourism will continue to be a large component of the local economy.
- The operation of a full-time flight school and/or the basing of an active corporate flight department could generate more traffic at KNB than anticipated in the Growth Scenario.
- The price of avgas has dropped over the last year and a half, which has helped stimulate GA traffic. Energy analysts anticipate that fuel prices will remain low compared to levels seen in 2010-2014, which will continue to stimulate GA demand. In addition, the FAA and industry are working on finding an unleaded "drop-in" replacement for 100LL avgas, and FAA anticipates it will certify a replacement fuel within two years.
- Numerous aviation organizations including EAA, AOPA, NBAA, etc., are actively promoting general aviation. Programs like the EAA's Young Eagles have generated interest in GA among young people. It is anticipated that such programs will continue to generate more GA activity.

FIGURE 3-18 – RECOMMENDED AIRCRAFT OPERATIONS FORECAST - KNB



Source: Jviation. Note: Growth = 1.7% per year growth rate.

FIGURE 3-19 – RECOMMENDED BASED AIRCRAFT FORECAST - KNB



Source: Jviation. Note: Growth = 1.7% per year growth rate

3.9 Comparison Between Recommended Forecast and FAA TAF

The FAA AC 150/5070-6B, *Airport Master Plans*, states: "Planners should compare their forecast results with those contained in the most recent FAA Terminal Area Forecast (TAF). The general requirement for FAA approval of the master plan study's forecasts is that they are supported by an acceptable forecasting analysis and are consistent with the TAF. Master plan forecasts for operations, based aircraft, and enplanements are considered to be consistent with the TAF if they meet the following criteria: Forecasts differ by less than 10 percent in the 5-year forecast and 15 percent in the

10-year period." While the percentage difference between the master plan forecast and the FAA's TAF in 2025 exceeds FAA's guidelines, the actual numbers are relatively small and differences viewed as reasonable considering historical levels of activity. As noted previously, a full-time flight school and/or the location of corporate flight department at KNB could generate more traffic than projected in the Growth Scenario.

TABLE 3-12 – COMPARISON OF FORECASTS AND TAF FORECASTS, 2014-2029 (FAA FORMAT)

Operations	Airport Master Plan Forecast	FAA TAF[1]	AMP Forecast / TAF % Difference
GA Aircraft Operations			
– Base Year (2015)	3,140	3,140	0.0%
– 2020	3,464	3,140	10.3%
– 2025	3,759	3,140	19.7%
– 2035	4,428	3,140	41.0%
Based Aircraft			
– Base Year (2015)	16	20	-20.0%
– 2020	22	20	10.0%
– 2025	24	20	20.0%
– 2035	28	20	40.0%

Source: Jviation
[1] TAF data is on a U.S. Government fiscal year basis (October through September)

3.10 Future Critical Design Aircraft, Airport Reference Code

The FAA notes that to qualify as the critical design aircraft, and determine the airport reference code (ARC), they must generate a minimum of 500 itinerant operations per year, which is almost one takeoff and landing every day over a year. Based on the factors described in the Growth Scenario, the future airport reference code (ARC) and critical design aircraft will remain the same as existing; ARC B-II, and the Beech King Air and Cessna Citation CJ series (**Figure 3-20**) as the critical design aircraft.

FIGURE 3-20 – CRITICAL AIRCRAFT

Source: Google Images

ARC B-II accommodates a wide range of piston and turbine aircraft, as shown below, in addition to almost every piston engine aircraft. Therefore, the importance of the B-II designation is that it represents a broad range, or family of aircraft, that encompasses most of the general aviation fleet that fly to KNB on a regular basis. In addition, KNB will continue to accommodate transient corporate aircraft, including occasional large corporate jets such as the Gulfstream IV, Falcon 2000,

and Challenger 605, etc., but they will not generate sufficient levels of activity to meet FAA's threshold for "substantial use," 500 itinerant operations per year.

TABLE 3-13 – AIRPORT REFERENCE CODE (ARC) B-II AIRCRAFT

Aircraft	Make & Model
Beechcraft	1900
Beechcraft	KING AIR C90
Beechcraft	SUPER KING AIR 200/250
Bombardier	BD-300/350
Cessna	208 Caravan
Cessna	CITATION CJ-1, CJ-2, CJ-3, MUSTANG, M@, SOVEREIGN
Dassault Falcon	50
Dassault Falcon	900
Dassault Falcon	2000
Embraer	Phenom 100/300
Fokker	F-28-1000/2000
Grumman	GULFSTREAM I
Honda	HondaJet HA-420
Pilatus	PC-12NG
Rockwell	Aero Commander 500/560/680
Sabreliner Corp	SABRELINER 65
Socata	TBM 900

Source: Burns & McDonnel Aircraft Characteristics