

## 2.0 INVENTORY

The first step in the airport master planning process, as outlined in Federal Aviation Administration (FAA) Advisory Circular 150/5070-6B, *Airport Master Plans*, involves gathering information about the airport and its environs. An inventory of current conditions is essential to the success of a master plan since the information also provides a foundation, or starting point, for subsequent evaluations.

### 2.1 Airport Overview

Kanab Municipal Airport (KNB or the Airport) is owned and operated by the City of Kanab. Kanab City is the most populous community in Kane County, Utah. Kanab Municipal Airport is located approximately three miles south of the City's commercial business district. The south boundary of the airport is the Utah-Arizona border. The Airport also serves the community of Fredonia, Arizona, six miles south of the state border. The municipal boundaries of Kanab City have been drawn to include the airport property, but several of the adjacent parcels are outside of the city boundaries. This Airport Master Plan is being undertaken with a grant from the Federal Aviation Administration (FAA), and therefore is prepared in compliance with FAA Advisory Circular 150/5070-6B, *Airport Master Plans*.

### 2.2 Airport History<sup>1</sup>

The first landing strip for aircraft in Kanab was built on the Chamberlain farm in 1934 following the adoption of the federal Air Mail Act, but it was little more than cleared brush in a pasture<sup>2</sup>. At the end of World War II, several Kanab men who served in the Army Air Corps saw the potential of air service to boost the local economy. Emron F. Robinson, a veteran and flight officer, spearheaded the efforts. A plaque honoring his achievements is mounted in the current terminal building. With funds from the Federal Airport Act of 1946, the State of Utah, and a \$1,500 donation from the local Lions Club, a site approved by the Civil Aeronautics Authority (CAA) was purchased by Kanab City. The Airport included a ranch owned by a widow, Clara E. Spencer, who successfully sued the city, which had undervalued her land along Kanab Creek<sup>3</sup>.

Work on KNB began in the spring of 1948 by the contractor A. O. Thorn & Sons. By August, both the mile-long oiled runway and a shorter dirt runway were nearing completion. On October 24, 1948, the official dedication of KNB was conducted by Governor Herbert Maw. There was a crowd of approximately 2,000 in attendance, including movie stars flown in by the Universal Motion Picture Studio. Yvonne De Carlo christened a civilian twin-engine plane and the field<sup>4</sup>. Within a few months of the airport opening, Kanab City received money for three metal hangars.

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<sup>1</sup> "Architectural Resources Survey and Effects Assessment, Kanab Airport Terminal & Electric Vault Project" prepared by Korral Broschinsky, November, 2015

<sup>2</sup> Kane County Standard, March 16, 1934

<sup>3</sup> Salt Lake Magazine, May-June 1994: 35-36, 101

<sup>4</sup> Kane County Standard, October 29, 1948

**Kanab Municipal Airport  
2016 Airport Master Plan**

Between 1958 and 1959, Kanab City completed \$50,000 worth of improvements to the airport. The Whiting and Haymond Construction Company from Springville was the low bid for two miles of pipeline to supply culinary water, two parking aprons, two taxi strips, and re-oiling of the access road from US Highway 89<sup>1</sup>. See **Figure 2-1**.

A local Kanab builder, Clifford Heaton, was awarded the contract for a new airport administration building with a bid of \$10,835<sup>2</sup>. The administration building was a square brick structure with Modern-style sloped roof. The building also functioned as the main passenger terminal for the airport. The building was expanded with a frame addition around 1980. The addition included an outdoor waiting area under a sheltered canopy. Around this time, two additional hangars were built. Richard Brewer, the airport manager for seventeen years, lived in a house built just south of the terminal building (demolished in 2013).

FIGURE 2-1 – KANAB MUNICIPAL AIRPORT CIRCA 1960



Source: "Architectural Resources Survey and Effects Assessment, Kanab Airport Terminal & Electric Vault Project" prepared by Korral Broschinsky, Nov. 2015

At the turn of the twenty-first century, Kanab City built a long narrow hangar at the northeast end of the parking apron. A large private hangar was built south of the manager's house around 2003. The United Parcel Service (UPS) uses a storage shed just east of this hangar. Three additional private hangars were built around 2008. The largest building at KNB is the Kane County Sheriff's Department Search & Rescue facility (KCSAR) also built around 2008. The proposed new terminal

<sup>1</sup> Springville Herald, September 11, 1958

<sup>2</sup> Salt Lake Tribune, August 22, 1958

building and electrical vault are part of a long range plan for improvements to the airport, which is projected to have a steady increase in activity for through the next decade (KNB 2002 Master Plan).

### **2.3 Existing Documents**

Existing documentation relating to the airport has been obtained and reviewed. This includes the following documents, plans, and information:

- KNB airport engineering and construction projects. The City has completed a number of projects at the Airport, as listed in **Table 2-1**. The City is constructing a new terminal building, which will be completed in spring/summer 2016.<sup>1</sup> The existing terminal building will be removed when the new building is opened.

TABLE 2-1 – PAST PROJECTS COMPLETED AT KNB

<b>Year</b>	<b>Funding Source</b>	<b>Project</b>	<b>Amount</b>
2014	FAA	AIP-12 Security Fencing	\$418,773
2013	UDOT	Airport Pavement Maintenance (Crack Seal & Paint)	\$106,690
2012	FAA	AIP-11 - Replace Rotating Beacon and Record of Survey	\$86,283
2010	FAA	UDOT & AIP-09/10 - Apron Rehabilitation	\$1,051,292
2007	FAA	AIP-08 - Rehabilitate Runway Lighting & Signing	\$389,312
2006	UDOT	Airport Pavement Maintenance (Apron Crack Seal & Paint)	\$26,631
2005	FAA	AIP-07 - Runway Overlay	\$480,585
2003	FAA	AIP-06 - Rehabilitate Runway 1/19 and Lengthen to 6,200'	\$1,792,302
2002	FAA	AIP-05 - AWOS III Installation & Airport Layout Plan Update	\$150,475

Source: Kanab Municipal Airport, Creamer & Noble, and Jviation

- The previous KNB Airport Master Plan (AMP) was prepared in 2002. The forecasts of demand and the facility recommendations presented in the 2002 Master Plan were reviewed against actual recent trends in activity since the previous Plan. Based on activity trends in the late 1990s and early 2000s, as well as the forecasts and the then-current FAA design standards, the 2002 Master Plan recommends upgrading KNB to accommodate medium to large size corporate jets (see **Appendix C**).
- The Airport receives grants from Utah Department of Transportation (UDOT), and also accommodates aircraft operated by the State of Utah. The State of Utah has completed a number of studies as part of its continuous airport system planning process. In 2007 the State System Plan presented information about KNB (see **Appendix B**), as well as an economic impact study. Utah DOT classifies KNB as a regional airport.

<sup>1</sup> The terminal was completed in the summer of 2016.

- FAA’s Kanab Municipal Airport Terminal Area Forecast (TAF). The TAF is discussed in **Chapter 3, Aviation Activity & Forecasts**.
- Airport draft Minimum Standards, Tenant Leases, and Airport Budget. The FAA strongly recommends that airport sponsors adopt minimum standards, but does not require them. Minimum standards are a tool to ensure that the airport and its tenants are in compliance with the FAA grant assurances, and also ensure a level playing field for airport tenants by ensuring that everyone that provides aeronautical services on the airport is required to meet the same minimum standards. In addition to minimum standards, airports also typically have tenant leases, and in some cases airport operating rules and regulations, that are used as management tools. The FAA notes that minimum standards should be tailored to each individual airport, and they should also be consistent with the grant assurances. FAA does not approve minimum standards, although it will review and comment on them if requested to do so.
- Kanab City General Plan, Zoning Ordinance, and Guidance Documents. The City of Kanab adopted their latest General Plan in February, 2015. The Airport Master Plan must be consistent with the General Plan. The City’s vision statement notes, “Acknowledging our past and planning for the future, Kanab is a well-planned community that continues to:
  - Promote our western heritage, culture and values.
  - Retain a friendly small-town feel and charm.
  - Strive for a diversified economy and desirable development.
  - Provide a healthy and happy atmosphere of enrichment for all residents through all stages of life.
  - Act as a destination and gateway to regional parks, monuments and open spaces, and
  - Ensure an environment that promotes the highest quality of life for living, working, visiting, and playing.

The General Plan also specifically addresses KNB:

- Preserve industrial land use near the Airport
- Future possible areas of annexation include ... the County lands in the vicinity of the city airport.
- Encourage future industrial growth to occur primarily near the airport
- Plan airport improvements. Review and update Master Plan including needs for future air transportation in the region. Include the public and seek funding for improvements with transportation professionals.
- Airport Improvements. The Kanab Municipal Airport, located in the south end of Kanab, serves the business and tourist community with scenic flights and charter service. The paved runway is 6,193 feet long and 75 feet wide. As the community grows, more emphasis on expanded development and use of the airport will become an important issue. Updates of the Airport Master Plan should be completed using a public involvement process, utilizing professional transportation consultants, specializing in airport planning.

## 2.4 Acquire Aerial Imagery and Base Mapping

The FAA requires airport sponsors to have Airport Geographic Information System (AGIS) mapping prepared as part of airport master plans. The AGIS mapping is prepared for the FAA, and it is also used as a base for the Airport Layout Plan (ALP) drawing set that is included in the Airport Master Plan. The FAA published “A Guide to Airport Surveys” dated May 15, 2009<sup>1</sup> that explains the AGIS program. The FAA has also prescribed the mapping standards in three advisory circulars:

- Federal Aviation Administration, Advisory Circular 150/5300-16A, *General Guidance and Specifications for Aeronautical Surveys: Establishment of Geodetic Control and Submission to the National Geodetic Survey*. February 13, 2006.
- Federal Aviation Administration, Advisory Circular 150/5300-17C, *Standards for Using Remote Sensing Technologies in Airport Surveys*. September 30, 2011.
- Federal Aviation Administration, Advisory Circular 150/5300-18B, *General Guidance and Specifications for Submission of Aeronautical Surveys to NGS: Field Data Collection and Geographic Information System (GIS) Standards*. February 24, 2014. Note: FAA issued AC 150/5300-18C, *Survey and Data Standards for Submission of Aeronautical Data Using Airports GIS*, on September 30, 2015. However, FAA AC 150/5300-18B is the guiding document for the mapping undertaken for this Master Plan.

The FAA adopted the Airports Surveying Geographic Information System (AGIS) to help the Agency collect airport and aeronautical data to meet the demands of the Next Generation National Airspace System. One of the primary goals of the AGIS program is to streamline the airport survey process and centralize airport data storage into one integrated web-based Geographic Information System (GIS), called “Airports-GIS (AGIS).” Both the FAA and the National Geodetic Survey (NGS) review and approve the AGIS mapping for each airport when it is uploaded to FAA’s web site.

A number of lines of business within the FAA use the AGIS data, including Flight Procedures, Aeronautical Information Services, Air Traffic, and Airports, among others. The AGIS system is designed to be a complete “one-stop-shopping” site for obtaining and maintaining airport data for not only the FAA but airport sponsors as well.

Woolpert, Inc. acquired aerial imagery and mapping for the AGIS for KNB in the fall of 2015. Woolpert will upload the AGIS files to FAA’s web site in the spring of 2016, where it will be reviewed and accepted by the FAA and the National Geodetic survey (NGS). In addition to the mapping for the AGIS, Woolpert also collected the mapping necessary for the 14 CFR Part 77 imaginary surfaces that are shown in the Airport Layout Plan (ALP) drawing set. The areas that were mapped for the AGIS and Part 77 imaginary surfaces are shown in **Figure 2-2** and **Figure 2-3**.

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<sup>1</sup> FAA, [https://airports-gis.faa.gov/public/data/Airport\\_Survey\\_White\\_Paper.pdf](https://airports-gis.faa.gov/public/data/Airport_Survey_White_Paper.pdf)

**Kanab Municipal Airport  
2016 Airport Master Plan**

FIGURE 2-2 – LIMITS OF FAA AC-18B AGIS SURVEY



Source: Woolpert, Inc.

FIGURE 2-3 – LIMITS OF ALP MAPPING AND ONE FOOT CONTOURS



Source: Woolpert, Inc.

## 2.5 Existing Conditions

### 2.5.1 Airfield Facilities

Kanab Municipal Airport has a number of airside and landside facilities as shown in **Table 2-2**, **Table 2-3**, **Figure 2-4**, **Figure 2-5**, and **Figure 2-6**. See **Appendix D** and **Appendix E** for more information about airport facilities.

TABLE 2-2 – KNB AIRSIDE FACILITIES

Airside	Dimensions	Condition
Runway 1-19	6,193' x 75'	Fair
Taxiway	35' wide	Good
Transient parking – south apron	7,655 s.y. (530' x 130')	Excellent
Based aircraft tiedown – north apron	10,666 s.y. (200' x 480') 26 marked tiedowns	Excellent
Hangar 1	80' x 50' (approx. 4,000 s.f.)	Fair
Hangar 2	140' x 67' (approx. 9,380 s.f.)	Very Good
Hangar 3	57' x 50' (approx. 2,850 s.f.)	Good
Hangar 4	60' x 40' (approx. 2,400 s.f.)	Good
Hangar 5	32' x 30' (approx. 960 s.f.)	Fair
Hangar 6	47' x 28' (approx. 1,316 s.f.)	Good
Hangar 7	60' x 50' (approx. 3,000 s.f.)	Good
T-1 T-Hangars (10 units)	180' x 33' (approx. 5,940 s.f.)	Fair
100LL Avgas Storage Tank	Above Ground, 10,000 gals.	Good

Sources: Kanab Municipal Airport, Jviation, site visits, 2002 Airport Master Plan

Notes:

1. Building dimensions scaled off of aerial photos – buildings not measured.
2. Building condition assessment based on visual inspection. Engineering/structural/utility analysis not performed.

TABLE 2-3 – KNB LANDSIDE FACILITIES

Landside	Dimensions	Condition
Terminal Building (being replaced in 2016)	60' x 28' (approx. 1,680 s.f.)	Poor
Vehicle Parking Lot- Paved	90' x 90' (approx. 8,100 s.f.)	Good
Kane County Emergency Building	82' x 100' (approx. 8,200 s.f.)	Very Good
Airport access road – Paved two-lane	Approx. 20' wide	Good

Source: Kanab Municipal Airport, Jviation, site visits, 2002 Airport Master Plan, Creamer & Noble

**Kanab Municipal Airport  
2016 Airport Master Plan**

FIGURE 2-4 – KNB AERIAL, 2015



Source: Google Earth 2016



**Kanab Municipal Airport  
2016 Airport Master Plan**

**FIGURE 2-5 – KNB TERMINAL AREA, 2015**



Source: Jviation

Kanab Municipal Airport  
2016 Airport Master Plan

FIGURE 2-6 – KNB AIRPORT HANGARS



Source: Google Earth

Note: See **Table 2-2** for list of facilities

## 2.5.2 Airspace and Air Traffic Control (ATC)

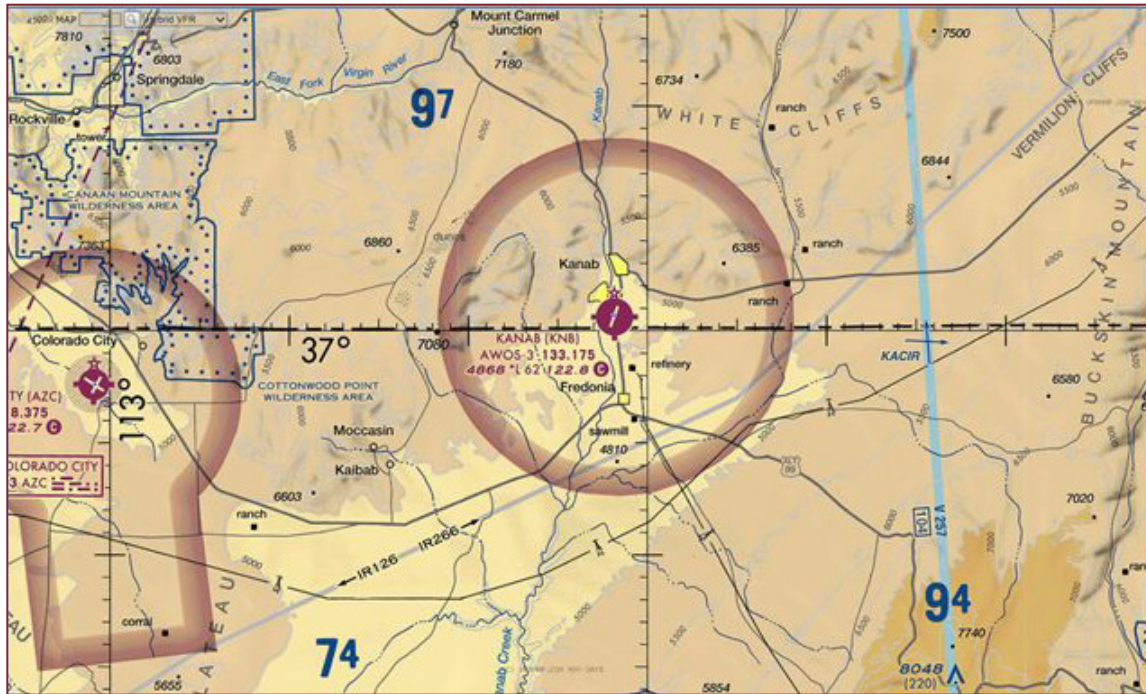
Kanab Municipal Airport does not have a control tower. Of the 47 public use airports in the State of Utah (source: UDOT), only three have control towers: Salt Lake City, Provo, and Ogden Hill AFB, north of Salt Lake City, also has a control tower.

Kanab Airport is situated in Class G airspace, which is defined by FAA as uncontrolled – i.e. air traffic controllers do not provide traffic separation for aircraft and aircraft do not issue ATC clearances to operate at Kanab Airport.

Starting at 700 feet above KNB elevation is Class E airspace, which is approximately four nm in radius and extends from 700 feet AGL up to 18,000 feet (**Figure 2-7**). Aircraft operators are only required to obtain a clearance from air traffic control (ATC) to fly within the Class E airspace when weather reports indicate that clouds are lower than 1,000 feet above the Airport and/or visibility is less than three miles. The weather at KNB is defined as Visual Flight Rules (VFR) more than 95% of the time. There is a low altitude instrument training route used by military aircraft that proceeds generally east-west, located approximately two miles south of KNB and just south of Fredonia, AZ (**Figure 2-7**). The military training route (MTR) has little impact on aircraft operations at the Airport.

For aircraft operating on instrument flight plans, Los Angeles Center is the controlling ATC facility. Radar and ATC communications coverage in the vicinity of Kanab does not extend below 9,000' above mean sea level (MSL). Due to the high percentage of time that the weather is visual (VFR), and that the majority of aircraft landing and departing Kanab operate under VFR, there are no delays reported by aircraft operators using the GPS Runway 1 approach, or with obtaining instrument approach clearances when operating at KNB. Los Angeles Center noted: "(Instrument – IFR) Traffic into and out of KNB is minimal." There is not a remote communications outlet (RCO) at the airport to allow pilots on or close to the ground at Kanab to talk directly with Los Angeles Center when obtaining instrument flight plan clearances or cancelling instrument clearances. Pilots use phones to call LA Center or a Flight Service station for clearances, which is less efficient and more time consuming than being able to use their radios via an RCO.

FIGURE 2-7 – AIRSPACE IN THE VICINITY OF KNB



Source: FAA

### 2.5.3 Instrument Approach and Departure Procedures

The FAA has published one instrument approach procedure to KNB – a non-precision (i.e. lateral guidance only) GPS approach to Runway 1. See **Appendix F** for the instrument approach and departure procedures. The lowest minimums on the approach are 569 above above airport elevation and one mile visibility. There is no approach light system to Runway 1. The minimums are higher than can be typically achieved with a non-precision GPS approach, indicating that there are obstructions in the vicinity of the airport. In addition, the departure procedures for aircraft operating under instrument flight rules (IFR) indicate the need to turn shortly after departing on Runway 1 to avoid high terrain north of the airport.

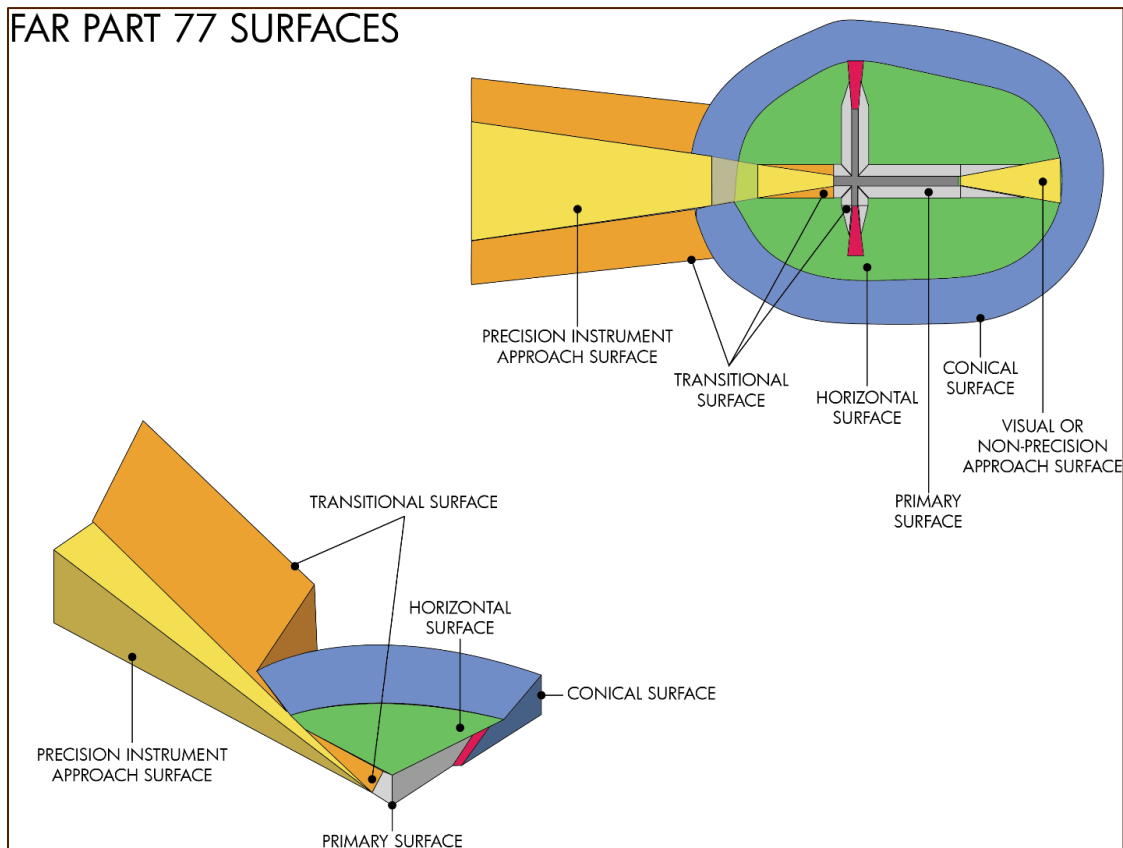
### 2.5.4 Obstruction Analysis

FAA defines the airspace in the vicinity of an airport in 14 CFR Part 77.25, *Safe, Efficient Use, and Preservation of the Navigable Airspace*. There are five imaginary surfaces (shown in **Figure 2-8**) that constitute airport-related airspace:

- **Primary surface.** A surface longitudinally centered on a runway. When the runway has a specially prepared hard surface, the primary surface extends 200 feet beyond each end of that runway.
- **Approach surface.** A surface longitudinally centered on the extended runway centerline and extending outward and upward from each end of the primary surface.

- **Transitional surface.** These surfaces extend outward and upward at right angles to the runway centerline and the runway centerline extended at a slope of 7 to 1 from the sides of the primary surface and from the sides of the approach surfaces.
- **Horizontal surface.** A horizontal plane 150 feet above the established airport elevation.
- **Conical surface.** A surface extending outward and upward from the periphery of the horizontal surface at a slope of 20 to 1.

FIGURE 2-8 – PART 77 SURFACES



Source: FAA

When an airport sponsor, such as the City of Kanab, accepts an FAA grant they agree to abide by the FAA's Sponsor Assurances. The FAA requires airport sponsors to adopt plans to address penetrations to the imaginary surfaces.

“20. Hazard Removal and Mitigation: It (the airport sponsor) will take appropriate action to assure that such terminal airspace as is required to protect instrument and visual operations to the airport (including established minimum flight altitudes) will be adequately cleared and protected by removing, lowering, relocating, marking, or lighting or otherwise mitigating existing airport hazards and by preventing the establishment or creation of future airport hazards.”<sup>1</sup>

<sup>1</sup> Source: FAA - Sponsor Grant Assurances

The 2004 Airspace Drawing prepared as part of the 2002 Airport Master Plan, identified nine penetrations to the imaginary surfaces in the vicinity of KNB. Among the penetrations are the mountains situated north of the airport, which penetrate the conical surface. The FAA acknowledges that sponsors are not able to remove certain natural objects such as mountains from imaginary surfaces, in which case obstruction lights can be installed. Woolpert, Inc. is mapping the airport and the surrounding airspace to identify the penetrations to the imaginary surfaces. Based on the type, location, number, and extent of the penetrations, an obstacle clearance plan will be developed.

### **2.5.5 Terminal Building / Landside Facilities**

The existing terminal building was constructed in 1958 with an addition constructed in 1980. It is a one story structure, constructed of mixed materials including brick, cinder block and wood, and includes offices, public lounge, and restrooms. It is approximately 1,680 square feet in size, and is connected with electricity, water, phone, and a septic system.

FIGURE 2-9 – EXISTING KNB TERMINAL BUILDING



Source: Jviation

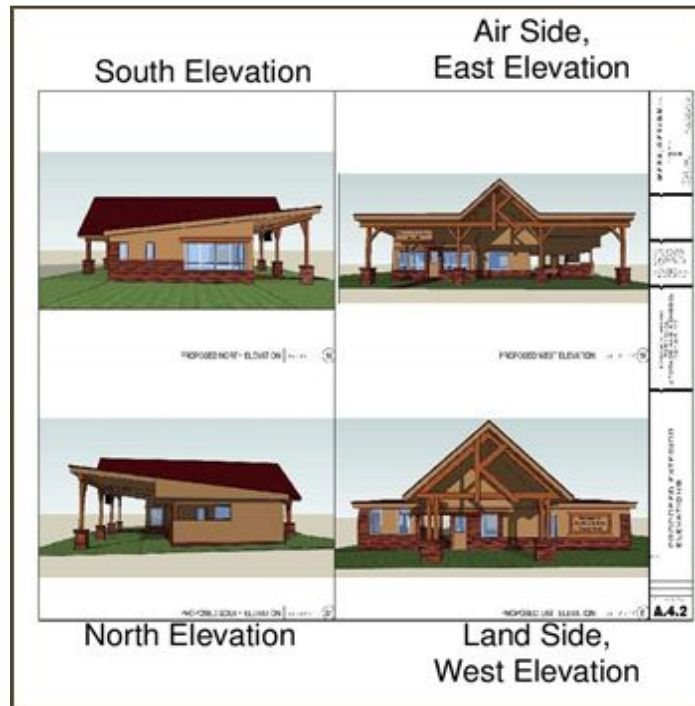
The City is planning to replace the existing terminal building in 2016 (**Figure 2-10** and **Figure 2-11**). The new terminal building was designed by Mesa Design, and draft exterior plans are shown in **Figure 2-10**. The new building will be one story, approximately 2,186 square feet in size, located east of the existing terminal building (i.e. further away from Runway 1-19). After the new building is constructed the existing terminal building will be demolished and removed.<sup>1</sup>

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<sup>1</sup> The new terminal building was completed in the summer of 2016.

**Kanab Municipal Airport  
2016 Airport Master Plan**

FIGURE 2-10 – PROPOSED KNB TERMINAL BUILDING



Source: City of Kanab website

FIGURE 2-11 – PROPOSED KNB TERMINAL AERIAL LAYOUT



Source: Jviation, Google Earth

### **2.5.6 Aircraft Storage & Parking Facilities**

There are seven conventional hangars and ten T-hangar units nested in a row. The total aircraft storage capacity in the hangars ranges from 20 to 40 aircraft depending on what type and size of aircraft are stored. There are 26 tie-downs for based aircraft. The transient parking apron can accommodate between 20 and 40 aircraft depending on the type and size of the aircraft parked, and how they are parked. The FAA's Airport Master Record Form 5010 for KNB lists 20 based airplanes (18 single engine and two multi-engine), which is less than the storage capacity available. The tie-down and transient parking aprons are in good condition with appropriate pavement markings.

### **2.5.7 Airport Ground Access and Parking**

KNB is accessible to cars, trucks, and emergency vehicles utilizing US Highway 89 and US Highway 89-A (Alternate). Highway 89 is located approximately three miles north of the Airport and U.S. Highway 89-A roughly parallels the airport one quarter mile to the east. The airport access road is two-lane, paved, and is large enough for commercial and emergency vehicles. There is a stop sign at the end of Airport Road at the intersection with Highway 89.

### **2.5.8 Utilities**

As noted above, the terminal building has electricity, water, phone, and septic system hook-ups.

### **2.5.9 Airport Support/Maintenance Equipment**

Airports utilize a variety of equipment for airfield maintenance including snow plows, grass mowers, tugs for aircraft and vehicles, crack sealers, pickup trucks for airfield inspection and moving equipment and supplies around the airfield, etc. Many airports utilize municipal equipment such as snow plows on an as-needed basis, rather than owning and maintaining their own equipment. When airports own and maintain their own support equipment they often store them in equipment storage buildings. Currently there is not an equipment storage building on the Airport.

### **2.5.10 Navigation & Communications Aids**

As noted above, the existing published instrument approach to KNB utilizes satellite-based GPS. The nearest ground-based navigation aid (NAVAID) is Bryce Canyon VORTAC<sup>1</sup> (frequency 112.8 MHz, identifier = BCE), situated 42.1 nautical miles north of KNB. There are several radio communication aids available to pilots in the vicinity of the Airport, as shown in **Table 2-4**.

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<sup>1</sup> VORTAC = Very High Frequency Radio Range with Tactical Air Navigation. MHz = megahertz.  
Source: FAA, Kanab Municipal Airport Facility Directory



**Kanab Municipal Airport  
2016 Airport Master Plan**

TABLE 2-4 – COMMUNICATION AIDS

<b>Communications Aid</b>	<b>Frequency</b>	<b>Purpose/Function</b>
Unicom/Common Traffic Advisory Frequency (CTAF)	122.8 MHz	Airport advisories (other traffic in the vicinity, pilot intentions, runway in use, etc.)
Los Angeles Center	124.2 MHz	Instrument flight plan clearances and radar services. Limited to approx. 9,000' or higher in vicinity of KNB
AWOS-3	133.175 MHz	Weather observation

Source: Form 5010, KNB Chart Supplement

### **2.5.11 Wind Coverage and Runway Utilization**

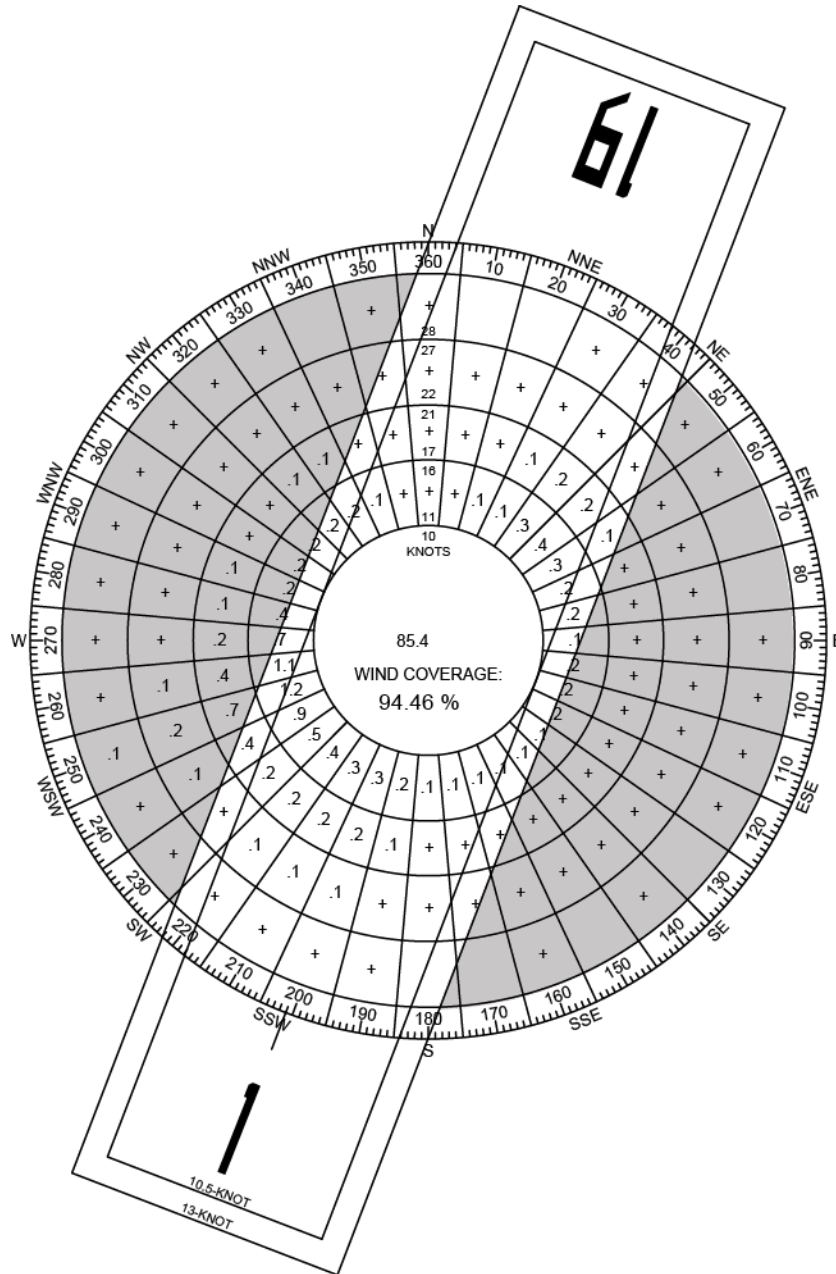
Whenever possible, pilots takeoff and land into the wind. Pilots are also trained to land and take off when the wind blows across runways (crosswind conditions). In addition, aircraft manufacturers are required by the FAA to publish the maximum allowable crosswind condition for each airplane. Airports with multiple runways typically have less crosswinds than single-runway airports, such as KNB.

The 2002 KNB Master Plan notes that Runway 19 accommodates approximately 70 percent of all takeoffs and landings, and Runway 1 accommodates approximately 30 percent of all operations. The 2002 Master Plan also notes that Runway 1-19 provides better than 95 percent wind coverage for 11.5-knot and 13-knot crosswinds. That exceeds FAA’s threshold for considering the need for a crosswind runway. As a result, there is no need to consider a crosswind runway at KNB.

Just for comparison, the wind analysis for the new St. George Regional Airport (SGU) concludes: “Through analysis of wind data collected by the Utah Department of Transportation at the proposed replacement airport site, it was determined that a Runway 01/19 alignment (oriented to magnetic headings of approximately 10 degrees and 190 degrees) would provide 94.1 percent wind coverage for the 10.5-knot crosswind component and 96.7 percent wind coverage for the 13-knot crosswind component. It would further provide 99 percent wind coverage for the 16-knot crosswind component.” SGU is the nearest airport with weather reporting and wind data, and the all-weather and IFR wind roses are shown in **Figure 2-12** and **Figure 2-13**.

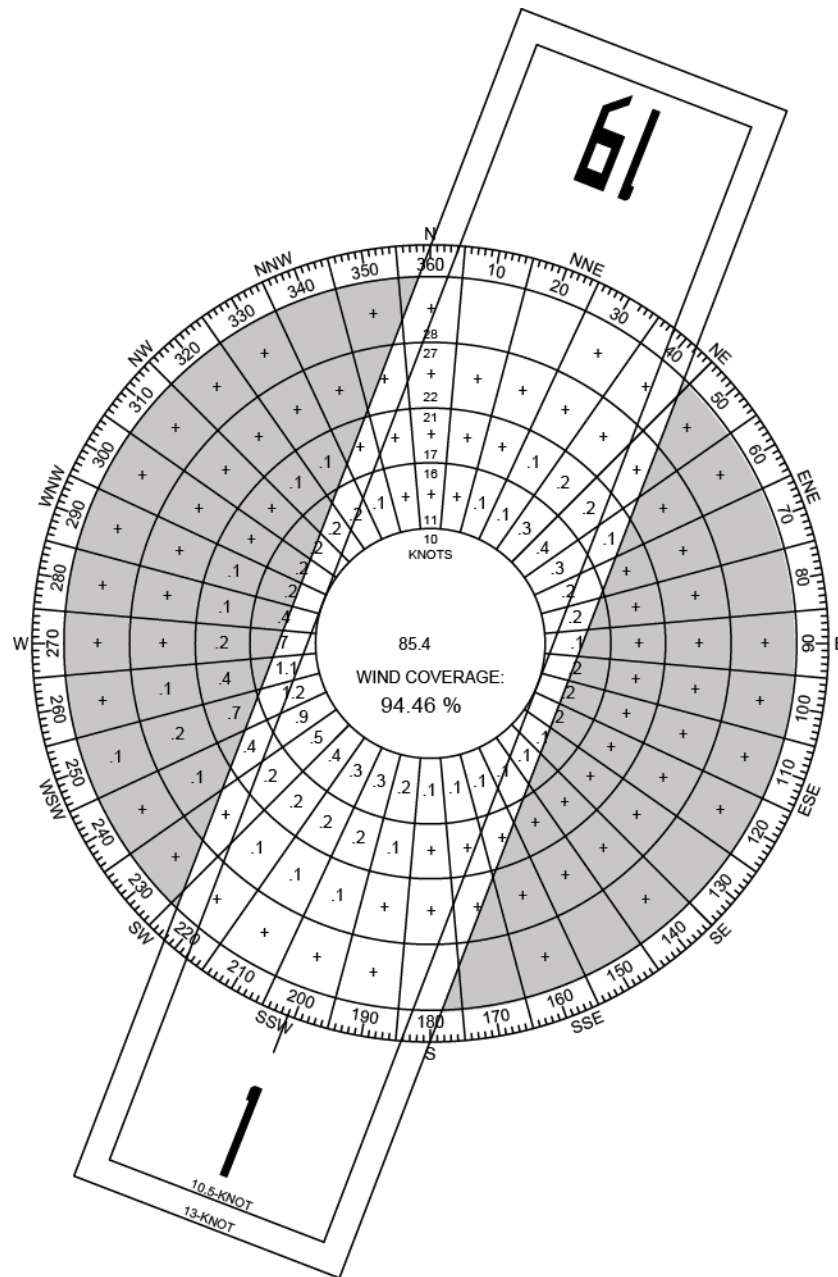
Kanab Municipal Airport  
2016 Airport Master Plan

FIGURE 2-12 – ALL-WEATHER WIND ROSE



Source: St. George Regional Airport, NCDC, Station 724754, Annual Period of Record: 2006-2015

FIGURE 2-13 – IFR WIND ROSE



Source: St. George Regional Airport, NCDC, Station 724754, Annual Period of Record: 2006-2015

## 2.5.12 Airport Operational Capacity

The FAA examines the Airport's operational capacity in relation to existing and future activity (demand) to determine when facility improvements are needed. A wide variety of factors affect an airports operational capacity and the extent of delays experienced by aircraft operators, including:

- The number of aircraft operations within a given time period
- Type of aircraft that operate within a given time period
- The percentage/mix of aircraft operations that are training (i.e. touch and go) vs. full-stop

- Weather conditions (visual, marginal, or instrument) when the majority of operations occur
- Percent/mix of aircraft that operate under visual (VFR) vs. instrument (IFR) flight rules
- The runway/taxiway system - specifically, the runway occupancy time by arriving and departing aircraft
- Air traffic control services and radar coverage

The operational capacity of KNB’s runway and taxiway exceeds the estimated current activity levels (Figure 2-14). KNB has a single runway, 1-19, with three taxiways in the middle, adjacent to the terminal building, and two taxiway turnarounds (aka run-up aprons) at each runway end. As a consequence, aircraft must back-taxi on the runway prior to departure, and many arriving aircraft also back-taxi after landing. The need to back-taxi increases the runway occupancy time, and reduces the operational capacity of the airport. Given the level of activity at KNB, however, there are no delays experienced by aircraft operators.

FIGURE 2-14 – KNB ACTIVITY VS. CAPACITY

	2015 KNB Operations	KNB Operational Capacity
<b>Annual Operations</b>	3,140	230,000
<b>Peak Hour Activity:</b>		
– Visual (VFR) Ops	4	98
– Instrument (IFR) Ops	2	54

Sources: FAA Terminal Area Forecast, FAA Advisory Circular 150/5060-2

The FAA recommends that, where feasible, runways have full parallel taxiways to eliminate back-taxiing on the runway and to enhance safety. KNB’s previous AMP recommends constructing a full parallel taxiway to Runway 1-19, with a separation of 400 feet between the runway and taxiway centerlines. The parallel taxiway was recommended to be 35 feet wide, which would meet FAA airport reference code (ARC) C-II design standards. A full parallel taxiway constructed to those standards would require property acquisition, as well as the cost of an environmental analysis, design and construction.

Due to the existing level of aviation activity at KNB and the lack of air traffic delays, a parallel taxiway to Runway 1-19 is not required to enhance operational capacity. However, a parallel taxiway would enhance operational safety by eliminating back-taxiing on the runway by arriving and departing aircraft. This will be examined further in the alternatives analysis.

## **2.6 Environmental Inventory & Data Collection**

The FAA AC 150/5070-6B, *Airport Master Plans* states, “The principal objective of an environmental overview is to document environmental conditions that should be considered in the identification and analysis of airport development alternatives.” This section will address various environmental factors that specifically apply to KNB.

FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*, and Order 5050.4B, *National Environmental Policy Act: Implementation Instruction for Airport Actions* addresses specific

environmental categories that are to be evaluated in environmental documents in accordance with the National Environmental Policy Act (NEPA).

### **2.6.1 Environmental Review Process**

FAA Order 1050.1F also presents the environmental review process and level of analysis required for each type of airport development project. Airport projects typically require the completion of an environmental assessment (EA) or can be categorically excluded through a documented categorical exclusion form (CATEX).

Actions normally requiring an EA include the establishment or relocation of approach light systems not on airport property and/or instrument landing system navigation aids, a new runway, construction or relocation of an airport entrance road, land acquisition associated with any of those improvements, etc.

Actions that are normally categorically excluded from further environmental analysis include administrative procedures, the installation/repair/upgrade of equipment necessary for safety and operations, the repair or replacement of infrastructure or facilities that are “generally minor in nature,” as well as other actions.

### **2.6.2 Airport Environment**

The following section inventories the applicable environmental categories and their existence at KNB. However, the following resources will not be discussed as they are not relevant to KNB and/or they relate to impacts from a specific project.

- Coastal Resources
- Climate
- Socioeconomic, Environmental Justice, and Children's Environmental Health and Safety Risks

#### *Air Quality*

Air quality analysis for federally funded projects must be prepared in accordance with applicable air quality statutes and regulations that include the Clean Air Act (CAA) of 1970<sup>1</sup>, the 1977 Clean Air Act Amendments<sup>2</sup>, the 1990 Clean Air Act Amendments<sup>3</sup>, and the National Ambient Air Quality Standards<sup>4</sup> (NAAQS). In particular, the air pollutants of concern in the assessment of impacts from airport-related sources include six “criteria pollutants:” carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO<sub>2</sub>), ozone (O<sub>3</sub>), particulate matter (PM-10 and PM-2.5), and sulfur dioxide (SO<sub>2</sub>).

All areas within the State of Utah are designated with respect to the NAAQS as being in attainment, nonattainment, maintenance, or unclassifiable. An area with air quality better than the NAAQS is

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<sup>1</sup> U.S. Code. The Clean Air Act of 1970. U.S. Congress, Public Law 91-604, 42 U.S.C. §7401

<sup>2</sup> U.S. Code. The 1977 Clean Air Act Amendments, U.S. Congress, Public Law 95-95, 42 U.S.C. §7401

<sup>3</sup> U.S. Code. The 1990 Clean Air Act Amendments, U.S. Congress, Public Law 101-549, 42 U.S.C. §7401

<sup>4</sup> 40 CFR Part 50, Section 121, National Ambient Air Quality Standard

designated attainment, while an area with air quality worse than the NAAQS is designated nonattainment. An area may also be designated unclassifiable when there is a lack of data to form a basis of attainment status.

KNB is located in Kane County, which is an attainment area for all pollutants.

***Biological Resources (Including Fish, Wildlife, and Plants)***

Requirements have been set forth by The Endangered Species Act<sup>1</sup>, The Sikes Act<sup>2</sup>, The Fish and Wildlife Coordination Act<sup>3</sup>, The Fish and Wildlife Conservation Act<sup>4</sup>, and the Migratory Bird Treaty Act<sup>5</sup> for the protection of fish, wildlife, and plants of local and national significance. The U.S. Fish and Wildlife Service’s (USFWS) Information, Planning, and Conservation (IPaC) System was used to identify species of concern.

It was found that various species listed by the USFWS as being threatened, endangered, or candidates may be found in the vicinity of the Airport. The identified species are depicted in **Table 2-5**. In addition to the species listed in **Table 2-5**, numerous migratory birds and eagles may exist in the area.

TABLE 2-5 – THREATENED AND ENDANGERED SPECIES NEAR KNB

<b>Group</b>	<b>Species</b>	<b>Scientific Name</b>	<b>Status</b>
<b>Birds</b>			
	California Condor	<i>Gymnogyps californianus</i>	Experimental population/non-essential
	Mexican Spotted Owl	<i>Strix occidentalis lucida</i>	Threatened
	Southwestern Willow Flycatcher	<i>Empidonax traillii extimus</i>	Endangered
	Yellow-billed Cuckoo	<i>Coccyzus americanus</i>	Threatened
<b>Flowering Plants</b>			
	Jones Cycladenia	<i>Cycladenia humilis var. jonesii</i>	Threatened
	Siler Pincushion Cactus	<i>Pediocactus sileri</i>	Threatened
<b>Mammals</b>			
	Utah Prairie Dog	<i>Cynomys parvidens</i>	Threatened
<b>Snails</b>			
	Kanab Amersnail	<i>Oxyloma haydeni kanebensis</i>	Endangered

Source: USFWS, Information, Planning, and Conservation System, Species Report, <https://ecos.fws.gov>, accessed January 2016

A survey would need to be completed prior to development to determine if any listed species occur on Airport property.

<sup>1</sup> Endangered Species Act of 1973, U.S. Congress, Public Law 93-205, 16 U.S.C §1531-1544

<sup>2</sup> Sikes Act, Amendments of 1974, U.S. Congress, Public Law 93-452

<sup>3</sup> Fish and Wildlife Coordination Act of 1958, U.S. Congress, Public Law 85-624, 16 U.S.C §661-666c

<sup>4</sup> Fish and Wildlife Conservation Act of 1980, U.S. Congress, Public Law 96-366, 16 U.S.C §2901-2912

<sup>5</sup> Migratory Bird Treaty Act of 1981, 16 U.S.C §703-712

### *Wildlife Management Planning*

In addition to the information presented above, UDOT prepared a Programmatic Sensitive Habitat Management Plan (HMP) in 2010. The HMP evaluated the potential for federally listed threatened, endangered, or candidate species, or state sensitive species to be present at each Utah Airport. From this report it was found that seven sensitive species have the potential to occur at KNB. **Table 2-6** depicts the species identified in the HMP.

TABLE 2-6 – POTENTIAL FOR SPECIES AT RISK NEAR KNB

<b>Common Name</b>	<b>Scientific Name</b>	<b>Status</b>	<b>Habitat Requirements</b>
Arizona Toad	<i>Bufo microscaphus</i>	Wildlife Species of Concern	Streams, washes, irrigated crop lands, reservoirs, and uplands adjacent to water
Burrowing Owl	<i>Athene cunicularia</i>	Wildlife Species of Concern	Usually inhabits open grassland and prairies, but also utilizes other open situations, such as golf courses, cemeteries, and airports; usually nests in mammal burrows, e.g., prairie dog, ground squirrel, or badger
Ferruginous Hawk	<i>Buteo regalis</i>	Wildlife Species of Concern	Open farmlands, grasslands, deserts, and shrub steppes; nest substrates may include trees and shrubs, cliffs, utility structures, ground outcrops, haystacks, or abandoned buildings; high elevations, forests, and narrow canyons are avoided; however, because of a strong preference for elevated nest sites, cliffs, buttes, and creek banks are usually present
Fringed Myotis	<i>Myotis thysanodes</i>	Wildlife Species of Concern	Inhabits caves, mines, and buildings, most often in desert and woodland areas
Great Plains Toad	<i>Bufo cognatus</i>	Wildlife Species of Concern	Desert, grassland, and agricultural areas
Southwestern Willow Flycatcher	<i>Empidonax traillii eximius</i>	Federally Endangered	Riparian habitats, especially areas of dense willow
Western Toad	<i>Bufo boreas</i>	Wildlife Species of Concern	Includes a variety of habitats, including slow moving streams, wetlands, desert springs, ponds, lakes, meadows, and woodlands

Source: UDOT, Programmatic Sensitive Habitat Management Plan, Volume II, May 2010

### *Department of Transportation Act, Section 4(f)*

The Department of Transportation (DOT) Act, Section 4(f) provides that the:

Secretary of Transportation will not approve any program or project that requires the use of any publicly owned land from a public park, recreation area, or wildlife and waterfowl refuge of national, state, or local significance or land from an historic site of national, state, or local significance unless there is no feasible or prudent alternative and the use of such land includes all possible planning to minimize harm resulting from the use.<sup>1</sup>

<sup>1</sup> U.S. Department of Transportation Act, section 4(f), recodified and renumbered as § 303(c) of 49 U.S.C.

The FAA has adopted the regulations the Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA) issued in March 2008 (23 CFR Part 774)<sup>1</sup> to address project-related effects on Section 4(f) resources.

For Section 4(f) purposes, a proposed action would eliminate a resource's use in one of two ways, physical use or constructive use.

**Physical Use:** Action physically occupies and directly uses the Section 4(f) resource. An action's occupancy or direct control (via purchase) causes a change in the use of the Section 4(f) resources. For example, building a runway safety area across a fairway of a publicly-owned golf course is a physical taking because the transportation facility physically used the course by eliminating the fairway.

**Constructive Use:** Action indirectly uses a Section 4(f) resource by substantially impairing the resource's intended use, features, or attributes. For example, a constructive use of an overnight camping area would occur when project-related aircraft noise eliminates the camping area's solitude. Although not physically occupying the area, the project indirectly uses the area by substantially impairing the features and attributes (i.e., solitude) that are necessary for the area to be used as an overnight camping area.<sup>2</sup>

KNB is located in a rural area, primarily surrounded by open agriculture and ranch land. The nearest Section 4(f) properties are located in the City of Kanab, approximately one mile north of KNB. None of the properties are located adjacent to the Airport.

### ***Farmlands***

The Farmland Protection Policy Act (FPPA) regulates federal actions that may impact or convert farmland to a non-agricultural use. FPPA defines farmland as "prime or unique land as determined by the participating state or unit of local government and considered to be of statewide or local importance."

The Natural Resources Conservation Service (NRCS) Web Soil Survey is commonly used to identify areas of prime and unique farmland; soil data was not available for the area surrounding KNB. Currently, no land within the airport property boundary is actively being used for farmland. However, land adjacent to the Airport is actively being farmed. If future development projects would extend off airport property, potential impacts to the existing farmland should be considered.

### ***Hazardous Materials, Solid Waste, and Pollution Prevention***

The Resource Conservation and Recovery Act (RCRA)<sup>3</sup>, Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)<sup>4</sup>, Superfund Amendments and Reauthorization Act

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<sup>1</sup> Vol. 73 Federal Register, page 13395, Mar. 2008.

<sup>2</sup> A de minimis use cannot occur if a project constructively uses a Section 4(f) property. This is because the substantial impairment associated with a constructive use is more severe than the minor effects to which de minimis provisions apply.

<sup>3</sup> U.S. Code, 1976, Resource Conservation and Recovery Act, 42 USC, §6901

<sup>4</sup> U.S. Code 1980, Comprehensive Environmental Response, Compensation and Liability Act, 42 USC, §9601-9628



(Superfund)<sup>1</sup>, and the Community Environmental Response Facilitation Act (CERFA)<sup>2</sup> are the four predominant laws regulating actions related to the use, storage, transportation, or disposal of hazardous materials, chemicals, substances, and wastes. Federal actions that pertain to the funding or approval of airport projects require the analysis of the potential for environmental impacts per the regulating laws. Furthermore, property listed or considered for the National Priority List (NPL) should be evaluated in relation to the Airport’s location.

According to the NPL, no sites are located on or near the Airport.

The Airport provides 100LL and JetA fuel, which are stored on Airport property, in above-ground storage tanks.

***Historical, Architectural, Archeological, and Cultural Resources***

The National Historic Preservation Act<sup>3</sup> and the Archaeological and Historical Preservation Act<sup>4</sup> regulate the preservation of historical, architectural, archaeological and cultural resources. Federal actions and undertakings are required to evaluate the impact on these resources.

For the purposes of this Master Plan, historic, archaeological and cultural resources are districts, sites, buildings, structures, objects, landscapes, and Native American Traditional Cultural Properties (TCPs) that are on or eligible for listing on the National Register of Historic Places (NRHP). The NRHP currently lists 10 properties in Kanab, as noted in **Table 2-7** and shown in **Figure 2-15**.

In addition, the Kaibab Indian Reservation is located southwest of the Airport, across the Arizona state border, and approximately half a mile from the Airport.

A survey is required prior to development to determine if any historic, archaeological and cultural resources occur on Airport property.

TABLE 2-7 – NATIONAL REGISTER OF HISTORIC PLACES NEAR KNB

<b>Property Name</b>	<b>Location</b>	<b>Date Added to Registry</b>
Bowman-Chamberlain House	14 E. 100 South	1975
Cottonwood Canyon Cliff Dwelling	Address Restricted	1980
Kanab Library	600 South 100 E.	1995
Parry Lodge	89 E. Center St.	2003
Kanab Hotel and Cafe	19 W. Center St.	2003
Kanab (Union Pacific) Lodge	86 S 200 W	2003
Stewart--Woolley House	106 W 100 N	2001
Johnson, William Derby, Jr., House	54 S. Main St.	2001
Rider--Pugh House	17 W 100 S	2001
Kanab Post Office	22 N Main St	2011

Source: National Register of Historic Places, [www.nationalregisterofhistoricplaces.com](http://www.nationalregisterofhistoricplaces.com), Accessed January 2016

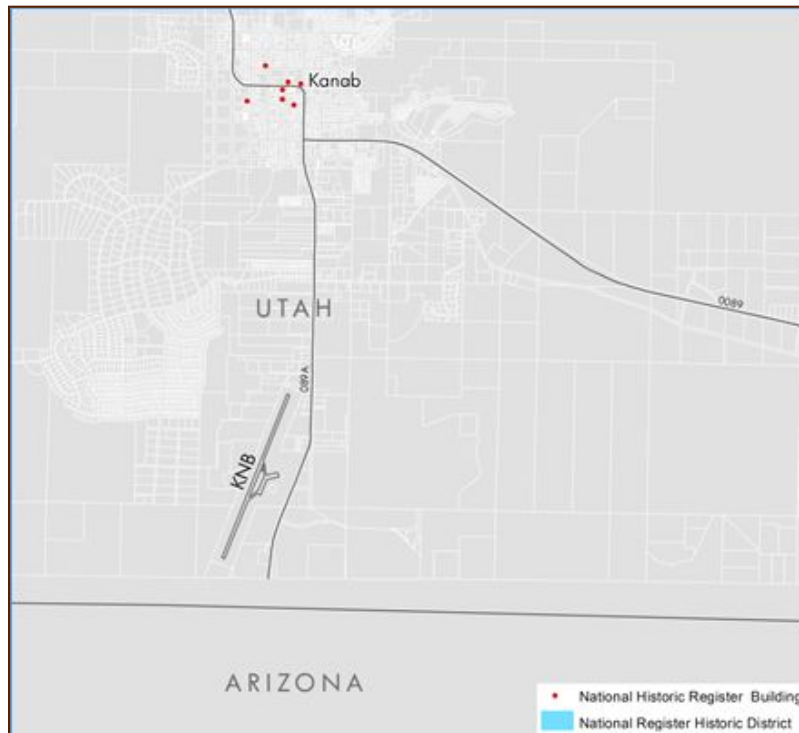
<sup>1</sup> U.S. Code 1986, Superfund Amendments and Reauthorization Act, 42 USC

<sup>2</sup> U.S. Code 1992, Community Environmental Response Facilitation Act, Public Law 102-426

<sup>3</sup> U.S. Code, 1966, National Historic Preservation Act of 1966, Public Law 89-665

<sup>4</sup> U.S. Code, 1974, Archaeological and Historical Preservation Act of 1974, 16 USC 469

FIGURE 2-15 – DESIGNATED HISTORIC SITES



Source: Utah State Geographic Information Database (SGID)

### *Land Use*

The compatibility of land uses promotes the safety, health, and welfare of airport users and surrounding neighbors by protecting airspace and ensuring appropriate uses of land within airport property boundaries, and surrounding an airport. Typically, development actions that may affect surrounding land uses are changes in airport fleet mix and/or the number of aircraft operations, air traffic changes, and new approaches.

Land within and surrounding the Airport property is zoned and regulated by the City of Kanab. The **Land Use** section below has zoning and land use information.

### *Noise and Noise Compatible Land Use*

Aircraft noise and noise sensitive land uses adjacent to airports are often important issues related to the airport environment. The FAA has established guidance on compatible land uses based on noise levels created by aircraft operations. The land uses adjacent to KNB are primarily open space and commercial. Based on the type of aircraft and level of existing aircraft activity at KNB, the land uses adjacent to the airport are considered to be compatible with aviation activity based on FAA's guidance.

### *Visual Effects (Including Light Emissions)*

Federal regulations do not specifically regulate airport light emissions; however, the FAA does consider airport light emissions on communities and properties in the vicinity of the airport. A

significant portion of light emissions at airports are a result of facilities, and safety and security equipment. KNB has four primary sources of light.

- Runway Lighting System
- Approach Lighting System
- Airport Beacon
- Apron/Parking Lights

All sources of light aid in the safety of operations at the airport and produce an insignificant amount of light on the surrounding area.

### *Water Resources*

Water resources are vital to society and include wetlands, floodplains, surface waters, ground waters, and Wild and Scenic Rivers. They provide drinking water and support recreation, transportation and commerce, industry, agriculture, and aquatic ecosystems. These resources act together as one integrated natural system. Impacts to one resource can disrupt the entire system. Water resources in the vicinity of the Airport are summarized in the following sections.

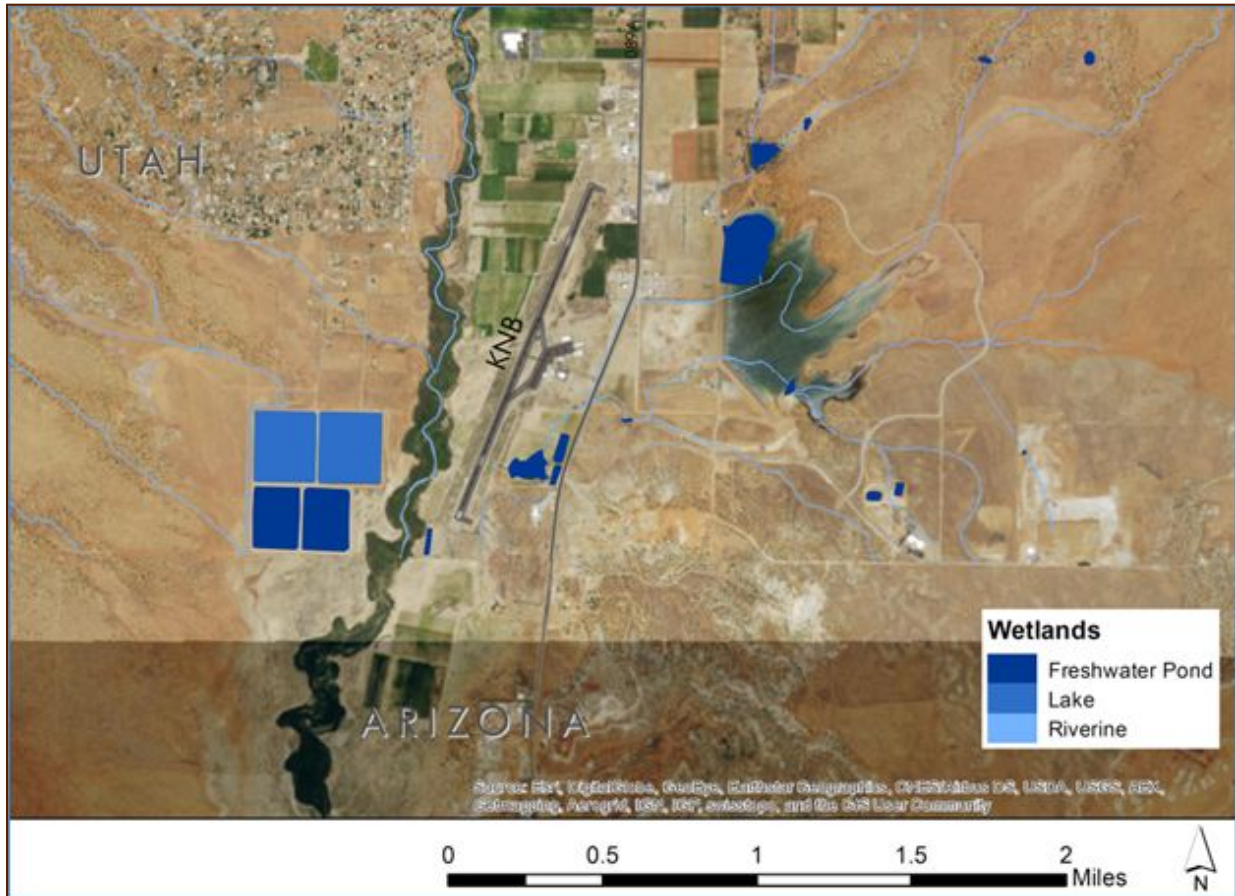
### *Wetlands*

Executive Order 11990, Protection of Wetlands, defines wetlands as “those areas that are inundated by surface or groundwater with a frequency sufficient to support and under normal circumstances does or would support a prevalence of vegetative or aquatic life that requires saturated or seasonally saturated soil conditions for growth and reproduction.”

As such, Federal agencies are required to minimize the destruction, loss, or degradation of wetlands. According to the Utah State Geographic Information Database (SGID), wetlands may exist on airport property as well as on adjacent land as show in **Figure 2-16**.

If future development is to occur in areas with the potential to have wetlands, a survey should be completed to determine the exact location of wetlands and potential impacts.

FIGURE 2-16 – WETLANDS IN THE VICINITY OF KNB



Source: Utah State Geographic Information Database (SGID)

### *Floodplains*

Executive Order 11988, Floodplain Management, directs federal agencies to “avoid to the extent possible the long and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative.”

According to the Federal Emergency Management Association (FEMA) Flood Insurance Rate Map (FIRM) panel number 4900850005A and 4900830039B, the Airport is within Zone C, an area of minimal flooding. Flood Zone A, an area of 100-year flood that has not had base flood elevations and flood hazard factors determined, exists to the east of the Airport along the Kanab Creek.

### *Surface and Ground Waters*

The Federal Water Pollution Control Act, as amended by the Clean Water Act<sup>1</sup> and the Safe Drinking Water Act, as amended, protect and regulate Federal actions that have the potential to impact surface and ground waters<sup>2</sup>.

The Kanab Creek is located to the east of the Airport and runs parallel to the runway. Additionally, the Spencer Number Two Reservoir is located approximately half a mile to the west of the Airport. Additionally, no ground water sites are present on or near the Airport.<sup>3</sup>

### *Wild and Scenic Rivers*

The Wild and Scenic Rivers Act, as amended, designates rivers and those eligible to be designated in the Wild and Scenic Rivers System. Wild and Scenic Rivers are designated as “rivers having remarkable scenic, recreational, geological, fish, wildlife, historic, or cultural values.” The Department of the Interior (National Park Service, U.S. Fish and Wildlife Service, and Bureau of Land Management) and the Department of Agriculture (U.S. Forest Service) are the oversight agencies for the Wild and Scenic Rivers System. Federal agencies with jurisdiction over lands the border upon, or are adjacent to any designated rivers, are required to take the necessary actions to protect the rivers, as stated in Section 12 of the Wild and Scenic Rivers Act.

Utah has one river listed in the National Wild and Scenic Rivers System, the Virgin River. The nearest designated portion of the River is approximately 30 miles northwest of the Airport.<sup>4</sup>

## **2.7 Land Use Plan**

The City of Kanab adopts and updates the Land Use Plan. Land around the Airport is designated as MD/GC/AG, which is mixed manufacturing, general commercial, and agricultural (**Figure 2-17**). Those land use types are typically compatible with aircraft activity and airport operations.

However, there are areas adjacent to the west and east of the airport that have been developed as medium density residential (MDR) and mixed medium residential (MDR), general commercial (G/C), agricultural (AG). Residential land uses are generally considered to be noise sensitive.

Based on the type of noise metrics used by the FAA, and the level and type of aircraft activity at KNB, the land uses adjacent to the Airport are compatible with airport and/or aircraft operations.

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<sup>1</sup> 33 U.S.C. Chapter 26.

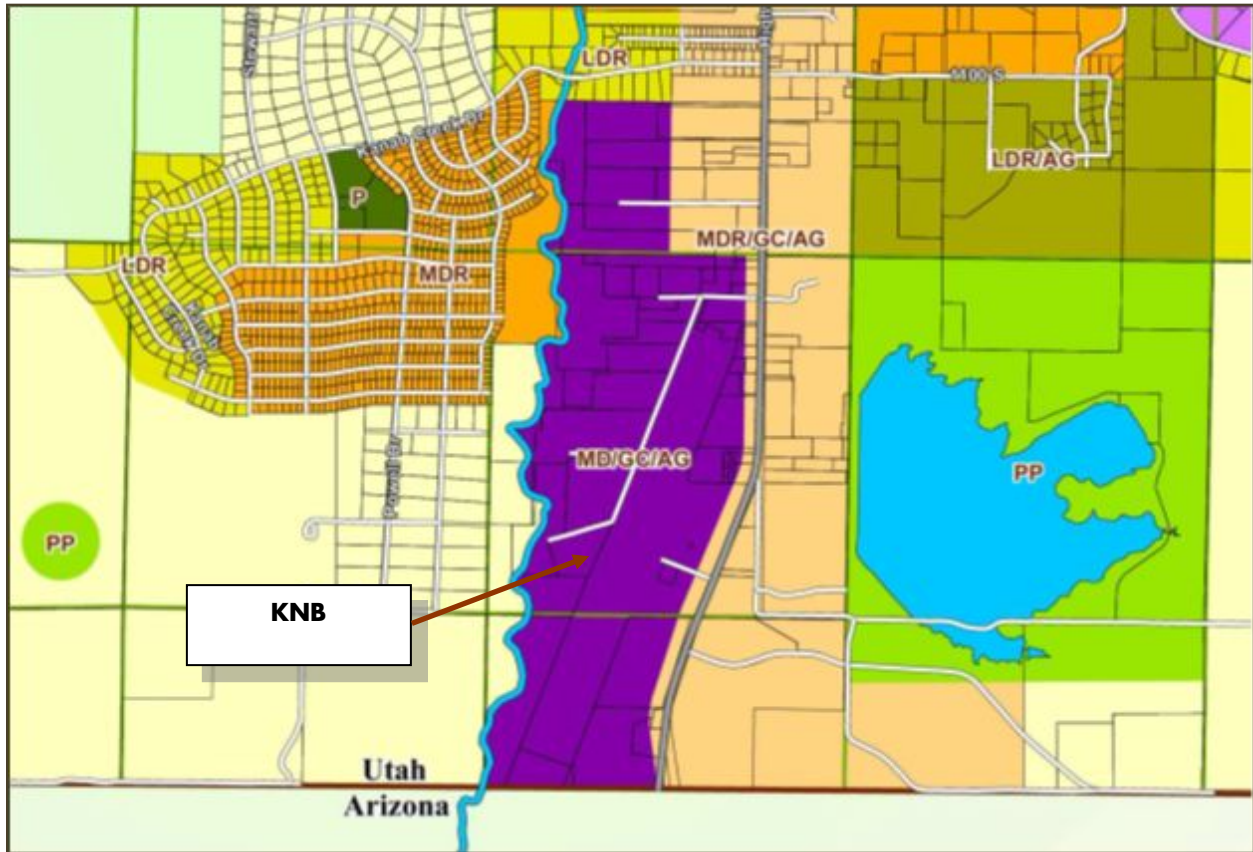
<sup>2</sup> 42 U.S.C. 300.f.

<sup>3</sup> USGWS, National Water Information System: Mapper, <http://maps.waterdata.usgs.gov/mapper/index.html?state=co>, Accessed January 2016

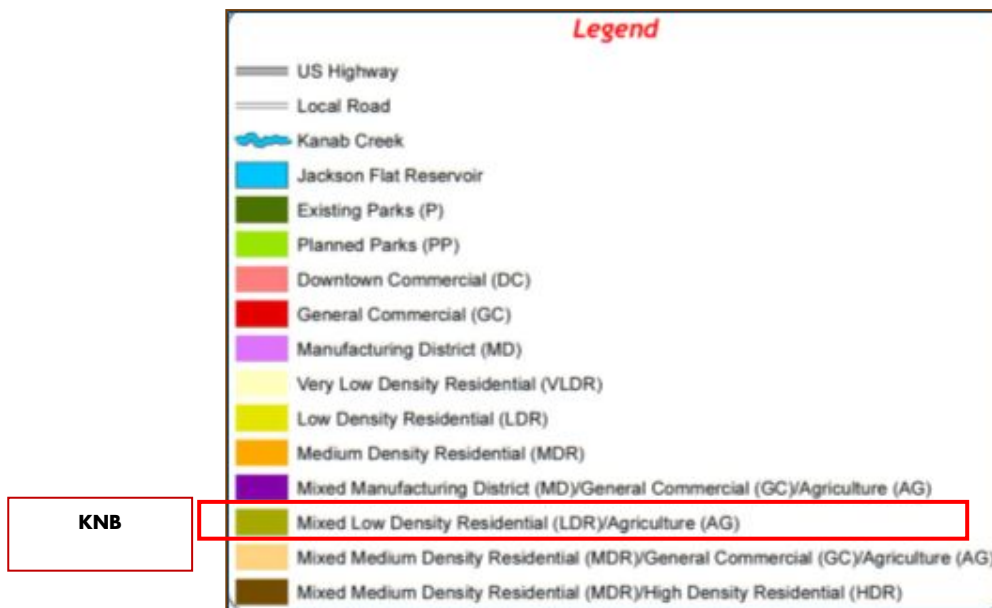
<sup>4</sup> National Wild and Scenic Rivers System, <http://www.rivers.gov/rivers/virgin.php>, Accessed January 2016

Kanab Municipal Airport  
2016 Airport Master Plan

FIGURE 2-17 – KNB GENERAL PLANNING – FUTURE LAND USE



Source: Kanab General Plan, 2015

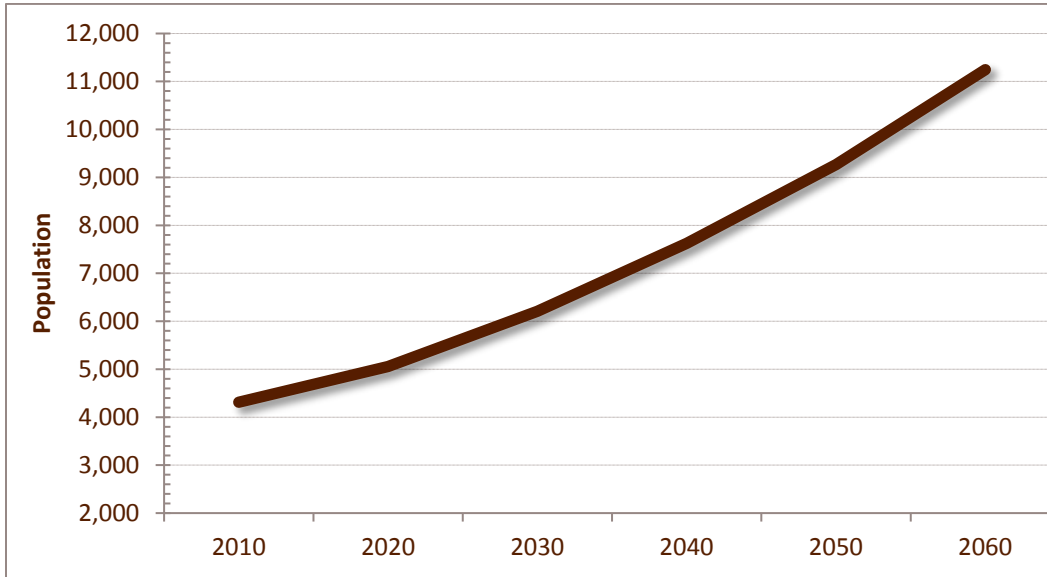


Source: Kanab General Plan, 2015

## 2.8 Demographics and Socioeconomic Analysis

According to the Utah Office of Management and Budget, the City of Kanab is projected to experience a 44% increase in population between 2010 and 2030. Between 2030 and 2060, the City's population is projected to increase by 81% (Figure 2-18 and Table 2-8).

FIGURE 2-18 – KANAB CITY POPULATION PROJECTIONS



Source: Utah State Office of Management and Budget, 2012

TABLE 2-8 – KANAB POPULATION PROJECTIONS

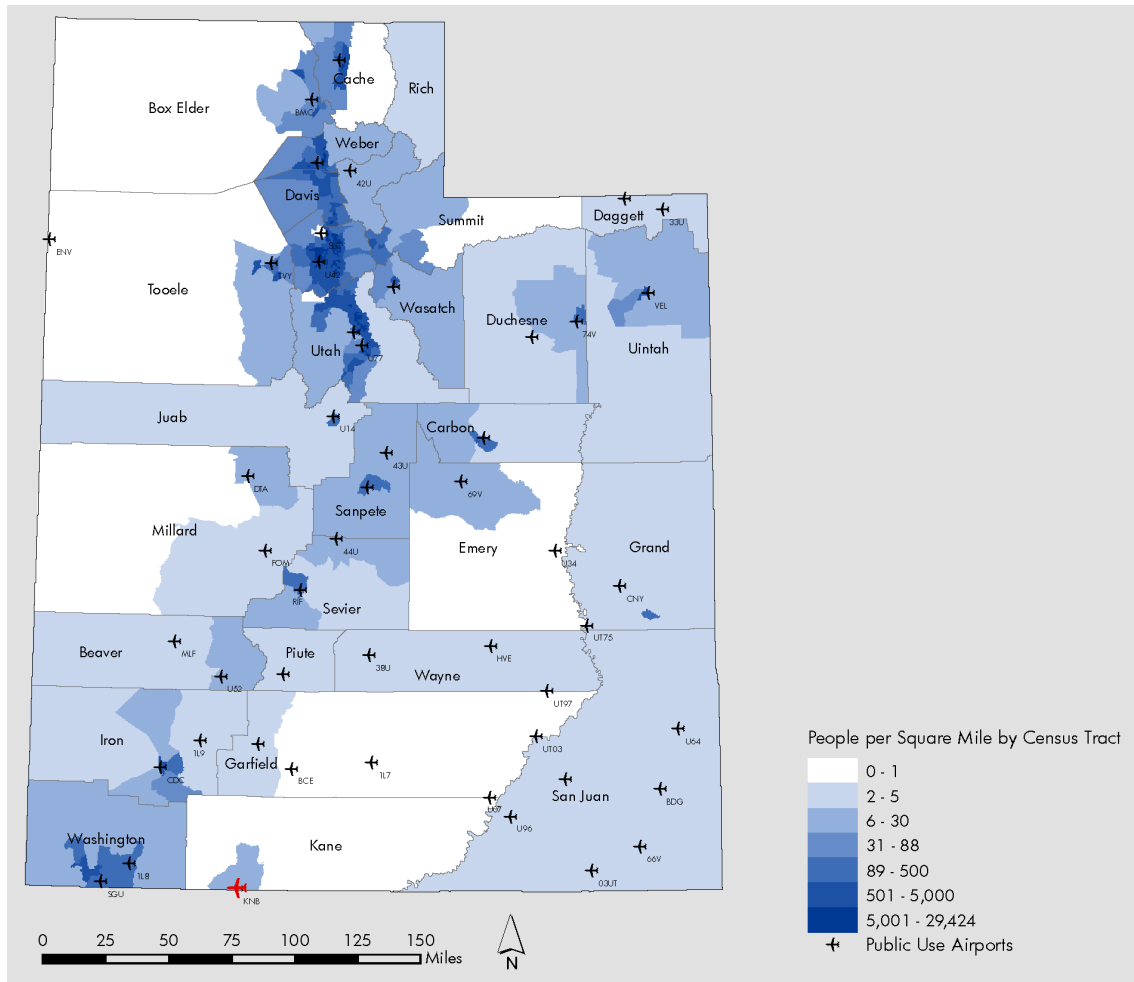
Year	Population
2010	4,312
2020	5,058
2030	6,209
2040	7,626
2050	9,268
2060	11,246

Source: Utah State Office of Management and Budget, 2012

Kane County, located on the southern border of Utah, adjacent to Arizona, has a relatively low population density. By 2040, the County's population is projected to increase by approximately 40%, but it will continue to be relatively low density (Figure 2-19 and Figure 2-20).

**Kanab Municipal Airport  
2016 Airport Master Plan**

**FIGURE 2-19 – KANE COUNTY POPULATION DENSITY**

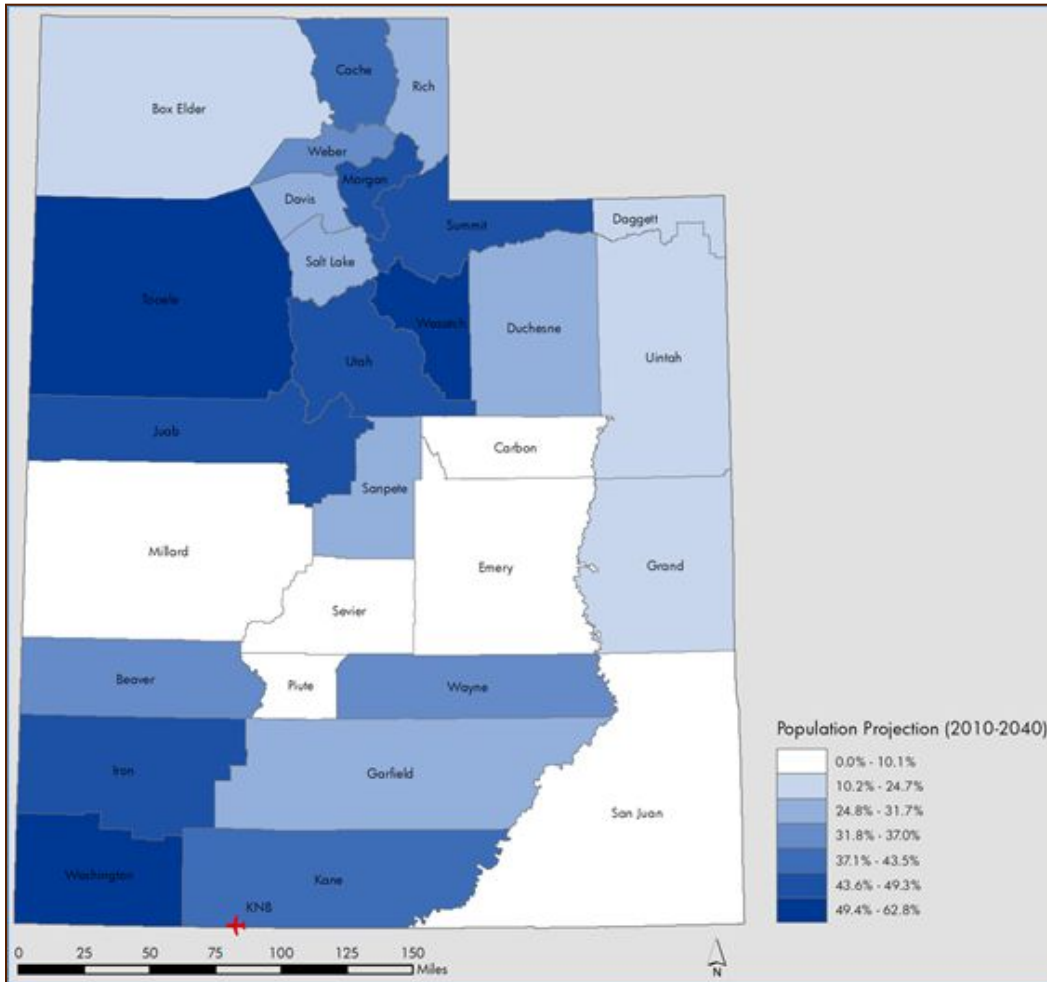


Source: Utah State Geographic Information Database (SGID)



Kanab Municipal Airport  
2016 Airport Master Plan

FIGURE 2-20 – KANE COUNTY POPULATION GROWTH RATE 2010-2040



Source: Utah State Geographic Information Database (SGID)