

5.0 ALTERNATIVES ANALYSIS

5.1 Introduction

As noted in FAA's AC 150/5070-6B, *Airport Master Plans*: "Airports have a wide variety of development options, so an organized approach to identifying and evaluating alternative development options is essential for effective planning. The key elements of this process are:

1. Identification of alternative ways to address previously identified facility requirements.
2. Evaluation of the alternatives, individually and collectively, so that planners gain a thorough understanding of the strengths, weaknesses, and other implications of each.
3. Selection of the recommended alternative."

5.1.1 Identify Alternatives

KNB has been operational for more than 60 years, and the Airport's physical facilities have been developed over that period to meet aviation demand in conformance with appropriate FAA design standards in effect at those times.

The existing and future aviation demand identified in this Master Plan can be accommodated within the boundaries of the existing Airport, and future development will be consistent with existing facilities. The identification and evaluation of alternatives was accomplished based on the need to accommodate demand and meet appropriate FAA design criteria.

Six areas were identified for alternatives evaluation, each of which is discussed below:

1. Upgrade KNB from FAA airport reference code (ARC) B-II to C-II design standards, as recommended in the 2004 Master Plan and the 2007 State System Plan.
2. Construct a full parallel taxiway to Runway 1-19, or use the existing taxiway system.
3. Publish another instrument approach procedure to Runway 1 with lower minimums, and potentially publish a new instrument approach to Runway 19.
4. Develop portions of the terminal area for non-aeronautical development purposes, primarily to generate additional revenue for the airport.
5. Remove the obstruction lights on the utility poles situated approximately 2 miles north of the airport.
6. Do nothing/no action.

5.1.2 Evaluate Alternatives

Five alternatives were identified and evaluated below. Each alternative analysis addresses unique issues, however, a common theme is the concept of the cost-benefit. For example, upgrading Kanab Airport to FAA airport reference code (design standards) C-II, or constructing a full parallel taxiway, or removing the utility poles and obstruction lights situated north of the airport, would require significant financial investments. FAA and UDOT could potentially award grants to cover some of the cost, but the City would be required to also contribute their share. Based on the existing and forecasted traffic levels at the airport, this analysis determined that the costs associated with some of the improvements cannot be justified by the potential benefits.

Alternative 1 - Upgrade KNB from ARC B-II to C-II	
<p>PROS KNB would meet design standards for C-II corporate jets, such as the Hawker 800, Challenger 605, Gulfstream G-III, G-IV</p>	<p>CONS KNB currently accommodates occasional C-II corporate jets, and can continue to do so in its present configuration.</p> <p>The existing and forecasted level of operations by ARC C-II aircraft does not meet FAA's substantial use threshold of a minimum of 500 itinerant operations per year. Many corporate jets, including the Cessna Citation series, Embraer Phenom, Falcon 50, 900, 2000, among others, are classified as B-II. The critical design aircraft for KNB, the Beech King Air 200/250 and the Cessna Citation CJ-3, fall within B-II.</p> <p>To meet C-II standards would require property acquisition, expanding the runway, moving the existing tie-down apron and some buildings, plus increasing pavement weight bearing capacity.</p> <p>The cost to upgrade KNB to C-II standards could range between \$18 million to \$22 million, including a new parallel taxiway to Runway 1-19. The actual cost will depend on a number of variables such as the cost to acquire property, facility relocation, etc.</p> <p>FAA funding for facility upgrades to C-II standards would be subject to FAA priority ranking, which places safety projects in the highest category, as well as funding availability.</p> <p style="text-align: center;">Recommended Alternative</p> <p>Maintain KNB in conformance with FAA Airport Reference Code (ARC) B-II standards within the planning period. To preserve future opportunity for C-II capabilities identified in the previous master plan, however, an ultimate plan to achieve C-II status beyond the planning period should be maintained.</p>

Alternative 2 - Construct Full Parallel Taxiway to Runway 1-19	
<p>PROS Enhance operational safety by moving back-taxiing aircraft from the runway to the taxiway.</p> <p>Increase operational capacity of the runway/taxiway system.</p>	<p>CONS Jviation estimated the cost to construct a full parallel taxiway would be approximately \$4 to \$5 million depending on the specific design standards applied.</p> <p>The existing taxiway system includes three mid-runway exits plus taxiway turnarounds/run-up pads at each runway end. The amount of time an aircraft spends back taxiing on the runway is 2-3 minutes.</p> <p>There are no operational delays at KNB. The line of sight from aircraft on the parking apron to both runway ends and the traffic pattern is clear.</p> <p style="text-align: center;">Recommended Alternative</p> <p>Construct a full-length parallel taxiway to enhance safety and the level of service to users. The taxiway should be constructed to C-II standards to comply with long-term, ultimate development potential.</p>

**Kanab Municipal Airport
Airport Master Plan**

Alternative 3 - Publish Additional Instrument Approach to Runway 1 and New Approach Runway 19

PROS

Enhance access to KNB during periods of poor weather, particularly by corporate aircraft.

CONS

FAA Flight Procedures has indicated that the mountains to the north of KNB require steep climb-out on the missed approach to Runway 1, which limits the approach minimums that can be published on an instrument approach.

FAA Flight Procedures has indicated that the mountains to the north of KNB prevent an instrument approach to Runway 19 from meeting their criteria in FAA Order 8260.3B, TERPS.

The predominant weather throughout the year at KNB are visual meteorological conditions (VMC), which decrease the need for low minimums on an instrument approach.

Publishing new instrument approaches would increase the size of the imaginary surfaces that would need to be clear, and potentially require the installation of additional obstruction lights in the vicinity of the airport.

Recommended Alternative

FAA maintain existing Non-Precision GPS approach to Runway 1. If changes in instrument approach criteria in the future allow, FAA should publish a Localizer Performance with Vertical Guidance (LPV) instrument approach to Runway 1. No approach light system is recommended to Runway 1 due to its construction and on-going maintenance cost, including the need to acquire property, as well as potential light impacts on residents south of KNB. Study and coordinate with the FAA on the ability to install a PAPI on Runway 19.

Alternative 4 – Develop Non-Aeronautical Land Uses on Kanab Municipal Airport

PROS

The Master Plan accommodated projected aviation demand needs beyond the 20-year planning period, and also identified property surplus for aviation purposes that could be developed for non-aeronautical purposes.

Generates needed revenue for the airport.

Will be done in full compliance with FAA requirements.

CONS

FAA will not permit non-aeronautical development if property is needed for existing or future aviation activity.

City of Kanab is responsible for ensuring that all non-aeronautical development is in full compliance with FAA requirements.

City may need to make investments in utilities, access roads, etc. to accommodate future non-aeronautical development, although that can be negotiated with future tenants/developers.

Recommended Alternative

Property designated surplus for non-aviation related purposes should be developed commercial, light industrial, and other non-aeronautical uses in order to generate revenue for the airport. City of Kanab, as the airport sponsor, is responsible for ensuring that all future non-aeronautical development will fully comply with FAA requirements.

**Kanab Municipal Airport
Airport Master Plan**

Alternative 5 – Remove the Obstruction Lights on Utility Poles Approx. 2 miles north of KNB

PROS

Would remove annoying lights and glare for residents and visitors to City.

CONS

FAA has determined that the obstruction lights are required because the utility poles penetrate the 14 CFR Part 77 Horizontal surface. The utility company could bury the powerlines and remove the utility poles and obstruction lights. This would be potentially expensive, and the construction would be disruptive to local residents, businesses and visitors. The utility company could relocate the powerlines and wires outside of the Horizontal surface, and then remove the obstruction lights. This would be potentially expensive, and given the rising terrain in the area, it would be challenging to meet the utility company needs for pole height and spacing, and also remain clear of the Horizontal Surface.

Recommended Alternative

Maintain the utility poles and obstruction lights north of the airport as they are. Relocating the utility poles and wires outside of the Horizontal Surface would likely be costly with no FAA assistance.

Alternative 6 – Do Nothing Alternative

PROS

This option assumes that no further improvements are made to KNB once the new terminal is completed. It represents the lowest cost option.

CONS

It does not address safety and convenience issues associated with the taxiway. It also would not allow future private hangar development, nor future non-aeronautical development that could potentially generate needed revenue for the airport.

Recommended Alternative

While the lowest cost of each of the options, the 'Do Nothing' option does not address specific issues, and could result in lost revenue to the airport.

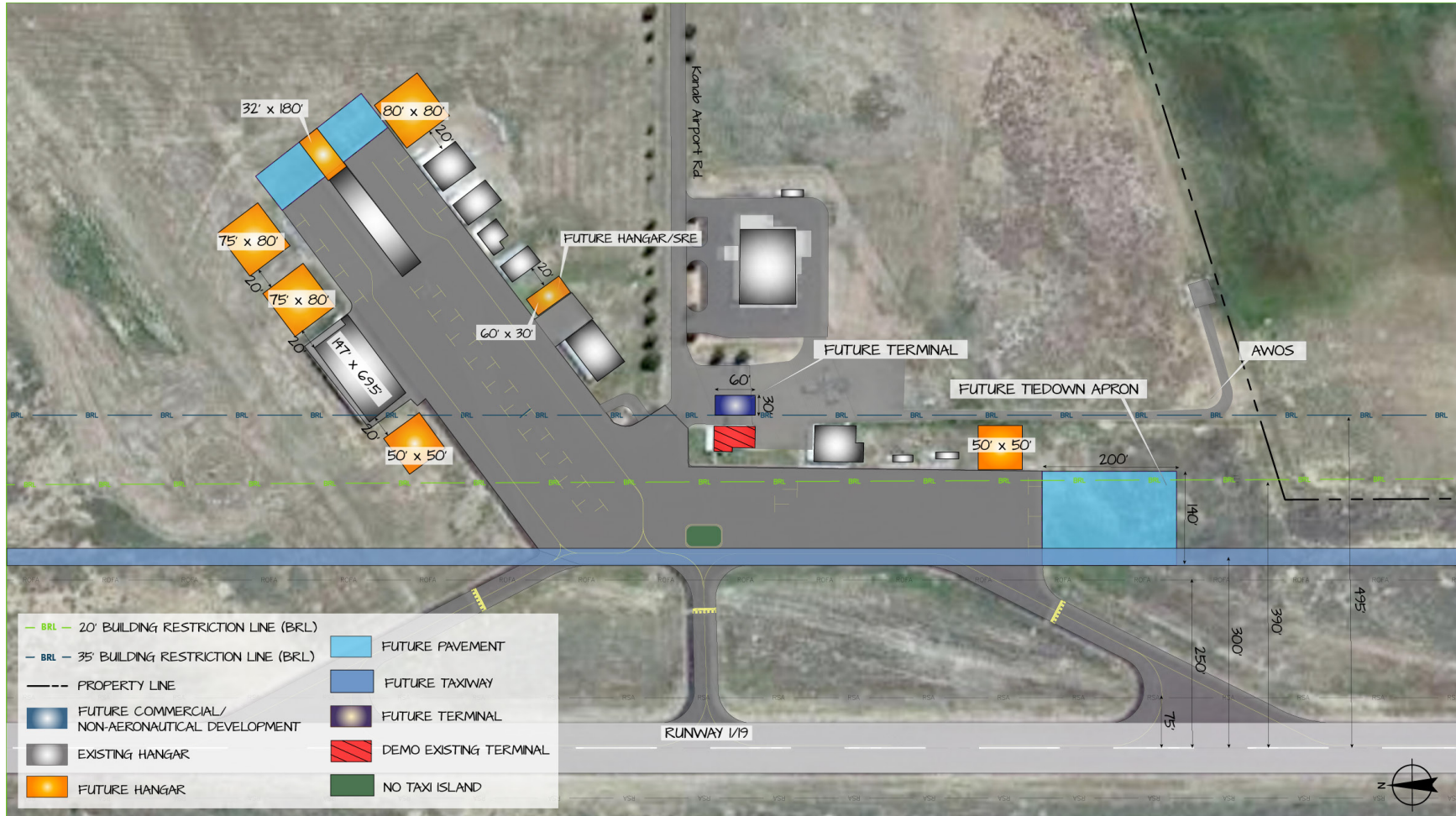
5.2 Preferred Alternatives

Based on the foregoing analysis the recommended preferred alternatives are listed below and shown in **Figure 5-1** and **Figure 5-2**:

- Maintain KNB as FAA airport reference code (ARC) B-II within the planning period. KNB currently meets B-II design standards, and the Airport presently accommodates occasional operations by C-II corporate jets. The forecasts of demand do not project that activity by C-II aircraft will meet FAA's substantial use threshold of a minimum of 500 itinerant operations per year by the end of the planning period. FAA has stated that they will fund facility upgrades only when aviation demand has been clearly documented that it requires the upgrade. An ultimate plan to achieve and maintain C-II status should be developed in order to preserve development in the previous master plan and allow for opportunities beyond the 20-year planning horizon.
- Construct a full parallel taxiway to better serve airport users and enhance safety. Direct apron to runway access taxiways should be altered to avoid possible runway incursions.
- FAA Flight Procedures has indicated that, given their current design standards, it is not feasible to publish another instrument approach procedure to Runway 1 with lower minimums, or to publish a new instrument approach to Runway 19 due to the mountains and high terrain to the north of the City. If FAA design standards change in the future, FAA should publish a Localizer Performance with Vertical Guidance (LPV) instrument approach to Runway 1. No approach light system is recommended to Runway 1 due to its construction and on-going maintenance cost, including the need to acquire property, as well as potential light impacts on residents south of KNB. Additionally, a PAPI for Runway 19 should be considered and studied.
- A Remote Communications Outlet (RCO) should be considered to improve communication capabilities with Los Angeles Center.
- Terminal area improvements include the expansion of the T-hangar, in-fill conventional hangar development, and itinerant tie-down expansion as demand warrants. The airport has on-going plans to replace/improve the terminal building, auto parking and Jet A fuel storage. Included in this area is the development of a snow removal equipment building.
- FAA should concur in the designation of property identified as surplus for aviation needs, and the City of Kanab should promote non-aeronautical development in designated areas on the airport in order to generate more revenue for the airport. The City will be responsible for ensuring the non-aeronautical development will be in full compliance with FAA requirements.
- The City should maintain the utility poles and obstruction lights north of the Airport as they are, based on their compliance with FAA obstruction awareness and 14 CFR Part 77 guidelines.

Kanab Municipal Airport Airport Master Plan

FIGURE 5-1 KANAB MUNICIPAL AIRPORT – FUTURE TERMINAL LAYOUT



Kanab Municipal Airport
Airport Master Plan

FIGURE 5-2 KANAB MUNICIPAL AIRPORT – FUTURE AIRPORT LAYOUT

