Chapter Three
Facility Requirements

INTRODUCTION

One of the primary objectives of this planning study is to determine the size and configuration of airport facilities needed to accommodate the types and volume of aircraft expected to utilize the airport. Data from Chapter 1 and forecasts from Chapter 2 are coupled with established planning criteria to determine what improvements are necessary to airside and landside areas. Then, having established the facility requirements, alternatives for providing these facilities are provided in Chapter 4 to determine the viability of meeting the facility needs.

The time frame for addressing development need usually involves short-term (0-5 years), medium-term (6-10 years) and long-term (11-20 years) planning periods. Long range planning primarily focuses on the ultimate role of the airport and is related to development. Medium-term planning focuses on a more detailed assessment of needs, while the short-term analysis focuses on immediate action items and may include details not geared towards long-term development.

Airport Reference Code

The Airport Reference Code (ARC) is a system established by the FAA that is used to relate airport design criteria to the operational and physical characteristics of the aircraft currently operating and/or intended to operate at the airport. The ARC has two components relating to the airport design aircraft. The first component, depicted by a letter, is the Aircraft Approach Category and relates to aircraft approach speed (operational characteristics). The second component, depicted by a Roman numeral, is the Aircraft Design Group and relates to aircraft wingspan (physical characteristic). Generally, aircraft approach speed applies to runway dimensional criteria and safety zones prior to and beyond the end of the runway. Aircraft wingspan is primarily associated with separation criteria involving taxiways and taxi lanes. Table 3-1 has been included to provide a definition of both Aircraft Approach Categories and Aircraft Design Groups. Figure 3-1 shows examples of aircraft and their Airport Reference Codes.

TABLE 3-1
AIRCRAFT APPROACH CATEGORIES AND DESIGN GROUPS

AIRCRAFT APPROACH CATEGORY: An aircraft approach category is a grouping of aircraft based on an approach speed of 1.3 times the stall speed of the aircraft at the maximum certificated landing weight.

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

AIRCRAFT DESIGN GROUP: The aircraft design group subdivides aircraft by wingspan. The aircraft design group concept links an airport's dimensional standards to aircraft approach categories or to aircraft design groups or to runway instrumentation configurations. The aircraft design groups are:

Design Group	Aircraft Wingspan
Group I	Up to but not including 49 feet
Group II	49 feet up to but not including 79 feet
Group III	79 feet up to but not including 118 feet
Group IV	118 feet up to but not including 171 feet
Group V	171 feet up to but not including 214 feet
Group VI	214 feet up to but not including 262 feet

To ensure that all airport facilities are designed to accommodate the expected air traffic and to meet FAA criteria, the specific ARC for the airport must be determined. In order to designate a specific ARC for an airport, aircraft in that ARC should perform a minimum of 500 annual itinerant operations.

AI
Primarily Single-Engine Propeller Aircraft, some light twins

Example Type: Cessna 172 Skyhawk

BI
Primarily Light Twin-Engine Propeller Aircraft

Example Type: Piper Navajo

BII
(<12,500 lbs)
Primarily Light Turboprops

Example Type: Beechcraft King Air

BII
(>12,500 lbs)
Mid-sized corporate jets and commuter airliners

Example Type: Cessna Citation II

A/BIII
Primarily large commuter-type aircraft

Example Type: De Havilland Dash 8

CI, DI
Primarily small and fast corporate jets

Example Type: Lear Jet 36

C/DII
Large corporate jets and regional-type commuter jets

Example Type: Gulfstream IV

C/DIII
Commercial airliners (approx. 100-200 seats)

Example Type: Boeing 737

C/DIV
Large commercial airliners (approx. 200-350 seats)

Example Type: Boeing 767

DV
Jumbo commercial airliners (approx. 350+ seats)

Example Type: Boeing 747

FIGURE 3-1 AIRCRAFT REFERENCE CODES

Facility design and planning is directly tied to the types of aircraft currently utilizing and anticipated to use Kayenta Airport. Establishing a design aircraft provides guidance for the dimensional requirements of the physical facilities at the airport. Items such as runway lengths and widths, taxiway dimensions and apron requirements relate to the design aircraft.

FIGURE 3-2 AIR AMBULANCE

Air Ambulance operators such as Eagle Air Med and Aero Care utilize the Kayenta Airport. The airplanes they fly into Kayenta are the King Air C-90 and the King Air 200, which are ARC B-II airplanes. The majority of aircraft currently using the airport range from category A-I to B-II and include single-engine piston aircraft and small to medium turbine aircraft. In evaluating these aircraft, the existing design ARC for the airport is predominately B-II with operations by aircraft weighing 12,500 pounds or less. The future design ARC is B-II with increasing numbers of operations by aircraft weighing over 12,500 pounds.

AIRSIDE FACILITY REQUIREMENTS

Airport airside facilities are described as the runway configuration, the associated taxiway system, the ramp and aircraft parking area and any visual or electronic approach aids. The establishment of recommended facility requirements are derived from the development of the based aircraft and annual operations forecasts. In addition, unique factors influencing growth at the airport are also considered.

RUNWAY CAPACITY

Hourly airport capacities and annual aircraft delay computations are needed to design and evaluate airport development and improvement projects. Capacity is a measure of the maximum number of aircraft operations which can be accommodated on an airport in one hour. While delay is the difference between constrained and unconstrained operating time.

FAA Advisory Circular 150/5060-5, Airport Capacity and Delay, provides guidance for calculating the runway utilizations, which produce the highest sustainable capacity consistent with current air traffic control rules and practices. In order to facilitate this comparison, computations were made to determine the hourly capacity of a single runway configuration in visual flight rules (VFR) and instrument flight rules (IFR). The calculations were made using the assumptions recommended in the AC for the particular airport layout and conditions, combined with the forecast operational data generated with this study. For operations from Runway 5/23, in the existing configuration, VFR runway capacity is 79 operations per hour and IFR capacity is 58 operations per hour. Thus, with forecasted peak hourly operations of 5.9 operations per hour, the existing runway configuration is considered adequate for capacity considerations.

The annual service volume (ASV) is the calculated reasonable estimate of an airport's annual capacity; taking into account differences in runway utilization, weather conditions and aircraft mix that would be encountered annually. When compared to the existing and forecasted operations of an airport, an ASV will give an indication of the adequacy of a facility in relation to its activity levels. The information used to calculate the Kayenta Airport ASV is based on the following assumptions: arrivals equal departures; there are no airspace limitations affecting runway use; the airport does not have radar coverage or an instrument landing system. The capacity is then calculated by selecting the airport configuration, determining the percentage of touch-and-go operations and utilizing the tables provided in AC 150/5060-5 to read the range of hourly VFR and IFR capacities.

The FAA recommends the initiation of actions to increase the capacity begin when actual activity levels reach 60 percent of ASV and that improvements should commence when actual activity levels reach 80 percent of ASV. Forecasted annual demand for Kayenta is 10,712 operations. The calculated ASV for Kayenta Airport is 230,000 operations, indicating that Kayenta Airport's existing configuration of a single runway is adequate to serve both the existing and future forecasted operational levels.

RUNWAY LENGTH

The FAA has developed a computer based program for estimating the recommended runway lengths by performing the calculations specified in AC 150/5325-4A, Runway Length Requirements for Airport Design. This program requires the following information: airport elevation; mean daily maximum temperature of the hottest month; and the maximum difference in runway centerline elevations. This information for Kayenta Airport is summarized below:

Airport Elevation	5,710 feet
Mean Max Temp of Hottest Month	91.5 ^{o} F
Runway Centerline Elevation Difference	75 feet

With this data the Airport Design Program provides several runway length recommendations for both small and large aircraft according to varying percentages of aircraft fleet and associated takeoff weights. A summary of the results is provided in Table 3-2.

Using only the results of the FAA's computer program, it is suggested that the runway have a minimum length of 5,050 feet to accommodate 75 percent of small airplanes with less than ten passenger seats, 7,150 feet to accommodate 100 percent of small aircraft with ten or more passenger seats and 9,350 feet to accommodate 75 percent of large aircraft at 90 percent useful load.

TABLE 3-2
RECOMMENDED RUNWAY LENGTHS

	Feet
Existing Runway	7,140
Small Aircraft (< 10 passenger)	
75 percent of these small airplanes	5,050
95 percent of these small airplanes	7,150
100 percent of these small airplanes	7,150
Large Aircraft (< 60,000 lbs.)	
75 percent at 60 percent useful load	7,820
75 percent at 90 percent useful load	9,350
100 percent at 60 percent useful load	11,750
100 percent at 90 percent useful load	11,750

Source: Airport Design Version 4.2d

When determining runway length requirements for any airport, it is important to also consider the types of aircraft, including aircraft design group and critical aircraft, that will be using the airport and their respective takeoff distance requirements. Figure 3-3 provides examples of takeoff distance requirements for typical aircraft currently using and expected to use Kayenta Airport in the future. Based on this information the existing length of 7,140 feet is sufficient to allow access by 100 percent of small airplanes and a selection of large airplanes.

RUNWAY STRENGTH AND WIDTH

Runway strength requirements are normally based upon the design aircraft that is expected to use the airport on a regular basis. The majority of air tour operators are flying the Twin Otter and the Jetstream 32, which have a maximum takeoff weight of 12,500 pounds and 18,629 pounds respectively. The King Air B-200 has a takeoff weight of 12,500 pounds. The airport pavements at Kayenta Airport are rated for aircraft weighing 12,500 pounds single wheel gear (SWG), although heavier aircraft may utilize the airport on an occasional basis without additional strengthening. The runway shows signs of rutting resulting from use by heavier aircraft. The pavements should be strengthened to 30,000 pounds single wheel gear (45,000 pounds dual wheel gear).

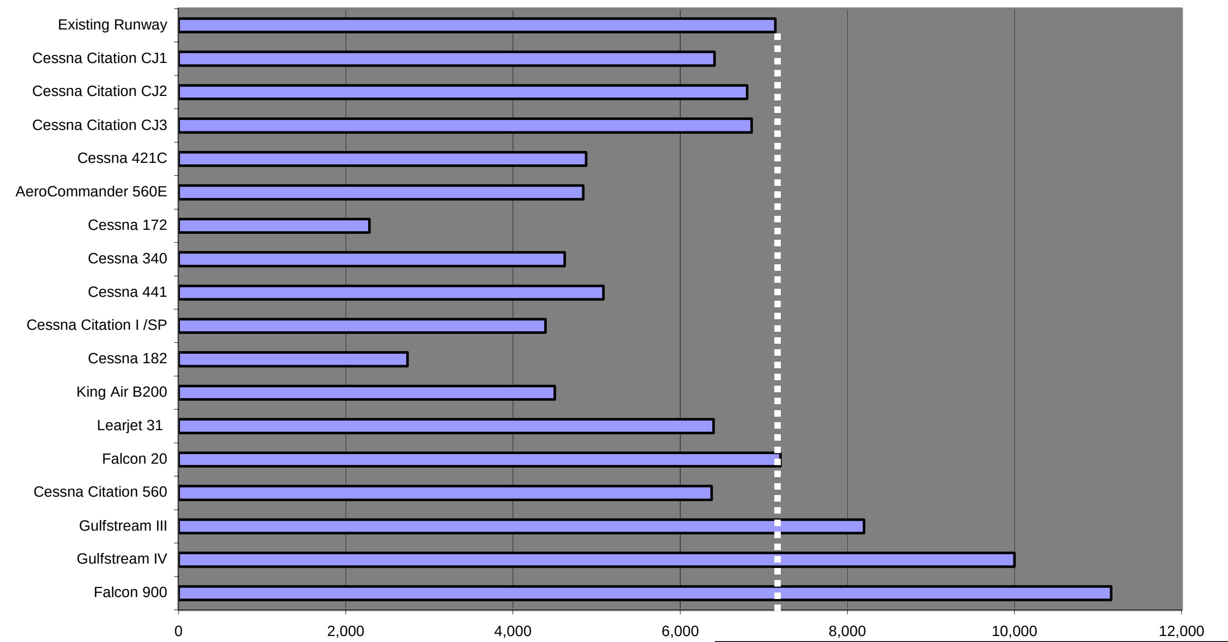
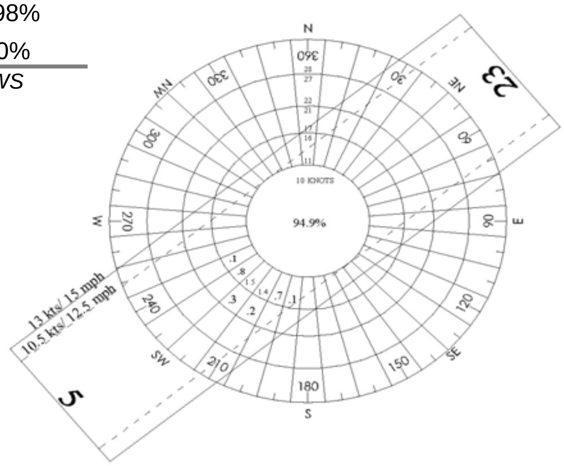


FIGURE 3-3 RUNWAY LENGTH REQUIREMENTS

SOURCE: AIRCRAFT MANUFACTURERS DATA

Wind Data	
Crosswind (knots)	All Weather Coverage
10.5	99.98%
13.0	100%

Source: Buckskin Lo Arizona RAWS September 2002-July 2004



SOURCE: BUCKSKIN LO ARIZONA RAWS SEPTEMBER 2002-JULY 2004

FIGURE 3-4 ALL-WEATHER WINDROSE

CROSSWIND RUNWAY REQUIREMENTS

As discussed in Chapter 1, an analysis of wind conditions is essential for planning runway alignments and runway system configurations. The primary runway should be oriented as closely as practicable in the direction of the prevailing winds. The crosswind component or winds perpendicular to the aircraft can restrict aircraft operations. The maximum allowable crosswind generally depends on the size and speed of the aircraft. The FAA recommends that runways be oriented to provide 95% crosswind coverage. This allows aircraft operations at least 95 percent of the time with allowable crosswind components not exceeding specified limits based upon the ARC. If a single runway alignment cannot meet the recommended 95 percent wind coverage, construction of an additional runway may be advisable.

Hourly wind data for Kayenta was obtained from a Remote Automated Weather Station (RAWS) near Kayenta. RAWS are usually owned and operated by wild land fire agencies and are placed in locations where they can monitor fire danger. RAWS wind speed and direction data is available from the Western Regional Climatic Center (WRCC) based on a 36-point wind rose. The RAWS station where data was collected is Buckskin Lo Arizona, located approximately 31 nautical miles southwest of the airport. A wind rose was created with 24 months of observations from the Buckskin Lo Arizona RAWS. The information obtained confirmed the existing runway configuration provides adequate wind coverage.

TAXIWAY REQUIREMENTS

The primary function of a taxiway system is to provide access between runways and the terminal area. The taxiways should be located so that aircraft exiting the runway will have minimal interference with aircraft entering the runway or remaining in the traffic pattern. Taxiways expedite aircraft departures from the runway and increase operational safety and efficiency. The construction of a parallel taxiway system is considered essential at airports having at least 20,000 annual operations or those served by commercial service.

According to FAA Advisory Circular 150/5300-13, Airport Design, the minimum recommended runway to taxiway centerline separation for an airport with an ARC of B-II is 240 feet and the minimum recommended width is 35 feet. Based on funding availability, construction phasing of a full-length parallel taxiway should be considered. Initially, by-pass taxiways should be constructed at each runway end, followed by a partial parallel taxiway from the apron area to the northeast end, then finishing with a partial parallel taxiway to the southwest runway end.

AIRCRAFT APRON

The key to a desirable airport layout is to provide the shortest taxiing distance from the terminal area or apron to the departure ends of the runway and to minimize the taxiing distance for landing aircraft as much as possible. Developing a functional apron layout involves evaluating aircraft parking and tiedown requirements, taxilanes, hangar and building development and proximities and overall apron space to accommodate existing and forecasted aircraft.

Aircraft tiedowns should be provided for those small and medium sized aircraft utilizing the airport. These aircraft risk damage in sudden wind gusts if not properly secured. A number of tiedowns are required to accommodate the peak daily transient and overnight transient aircraft plus based aircraft that are not hangared.

Generally speaking, an apron tiedown area for small aircraft should allow approximately 360 square yards per transient aircraft and 300 square yards per based aircraft. This square yardage per aircraft provides adequate space for tiedowns, circulation and fuel truck movement. Table 3-3 shows based and transient aircraft demand and tie-down requirements. The utilization of hangars may reduce the number of tie-downs required. A factor of .5 tiedown per based aircraft and 1.5 tiedowns per transient aircraft is expected to provide adequate space for parking since multiple tiedowns can be used by one large aircraft.

TABLE 3-3 APRON TIE-DOWN REQUIREMENTS

Year	Based Aircraft	Based Aircraft Tie-downs	Transient Aircraft	Transient Aircraft Tie-downs	Apron Area (SY)
2005	2	1	6	9	2,760
2010	6	3	8	12	4,680
2015	11	6	10	15	6,900
2020	12	6	12	18	7,920
2025	12	6	14	21	8,640

*Hangared aircraft will reduce based aircraft tiedown requirements

HELIPAD/HELICOPTER PARKING

Helicopter parking should be provided based on expected helicopter demand from the fleet mix in chapter 2. Type I, II and III helicopters are expected to use the airport. A parking apron with type II pads is recommended for the airport.

AIRFIELD LIGHTING, SIGNAGE AND MARKING

Airport lighting enhances safety during periods of inclement weather and nighttime operations by providing visual guidance to pilots in the air and on the ground. Lighting and visual aids can consist of a variety of equipment or a combination thereof as described in Chapter 1. The airfield lighting at Kayenta Airport are Medium Intensity Runway Lighting (MIRL); provide lighting at night on Runway 5/23. Runway 5/23 has visual markings which are in poor condition.

VISUAL AIDS

Visual Aids include a Visual Approach Slope Indicator (VASI) on Runway 23, which provide vertical guidance to pilots, wind indicator, segmented circle and a rotating airport beacon. The

VASI is currently out of service. It is recommended that the airport install pilot controlled lighting, precision approach path indicators (PAPIs) to replace the VASIs and rehabilitate the airport lighting system.

NAVIGATIONAL AIDS

A Navigational Aid (NAVAID) is any ground based visual or electronic device used to provide course or altitude information to pilots. NAVAIDs include Very High Frequency Omnidirectional Range (VORs), Very High Frequency Omnidirectional Range with Tactical Information (VOR-TACs), Nondirectional Beacons (NDBs) and Tactical Air Navigational Aids (TACANs) as examples. There are no ground based NAVAIDs at the Kayenta Airport. Ground based NAVAIDs are not needed or recommended at this time.

TRAFFIC PATTERN PROCEDURES

Right hand traffic patterns should be put into place for Runway 5, preventing aircraft from over-flying residential areas to the north of the runway.

APPROACH PROCEDURES

Non-precision Global Positioning System (GPS) approaches do not require ground-based facilities on or near the airport for navigation. The GPS receiver uses satellites for navigation allowing remote installation. Therefore, it involves little or no cost for the Airport Sponsor. GPS was developed by the United States Department of Defense for military use and is now available for civilian use. GPS approaches are rapidly being commissioned at airports across the United States. Approach minimums as low as 300-foot ceilings and 1-mile visibility are typical for this type of approach. An instrument approach will increase the utility of the airport by providing for the capability to operate in inclement weather conditions. This is especially important for air medivac/air ambulance, physician transport and business flights. It is also useful for conducting training and maintaining instrument currency and proficiency requirements.

There are no published instrument approach procedures at the Kayenta Airport, however a non-precision GPS approach should be implemented as soon as possible.

LANDSIDE FACILITIES

Airport landside facilities are an important compliment to airside facilities. Landside facilities serve as the processing interface between the surrounding community and the airport operating environment and often offer travelers the first impression of the area. These facilities house the support infrastructure for airside operations and can generate revenues for the airport.

FIGURE 3-5 LANDSIDE FACILITIES

AIRPORT SERVICES/FIXED BASE OPERATOR/TERMINAL

Kayenta Airport is unattended and currently no services are available. It is recommended that fuel, pilot/passenger lounge (i.e. terminal) and a courtesy car and or shuttle to hotels/town be provided at the airport for the general aviation public, as well as for the air tour operators and air ambulance operations. These services could possibly be incorporated with a cultural center on the airport allowing tourists to see what Kayenta has to offer.

HANGARS

Hangars are typically constructed in two forms: Box hangars or T-hangars. Box hangars are inherently more flexible and can accommodate a larger breadth of aircraft while T-hangars offer significant space savings. It is recommended that designated areas for both box hangars and T-hangars be provided to accommodate existing and future demand.

Hangars can be constructed through a variety of means. The airport sponsor can construct them with their own funds (a less common means) or choose to lease out portions of the airport property for hangars. In this case, an interested party obtains a long-term lease on the land and constructs a hangar (or hangars) on the airport property. This is beneficial to both parties because it provides a needed facility to the aircraft owner at no capital cost to the airport, it also generates airport revenue from the lease and generates property tax revenue to the Township from the hangar and based aircraft. An interested party may construct several T-hangars, using one while leasing out the remaining hangars as an aeronautical business.

ACCESS ROUTES

Airport access systems consist of parking facilities and connecting roadways that enable originating and terminating airport users to enter and exit the airport landside facilities. The airport is located adjacent to Arizona State Highway 160, which intersects Arizona State Highway 163 just west of the airport. Westbound State Highway 160 merges with State Highway 89 approximately 82 miles west of the Town of Kayenta. An asphalt two-lane road that enters the apron area provides current road access. Relocating the primary airport entrance to midfield is recommended. Arizona State Highway 160 should be outfitted with turn lanes for the airport in order to minimize traffic disruption from turning vehicles. Two airport signs should be installed along Highway 160 as well as an entrance sign for the airport.

AUTOMOBILE PARKING

Automobile parking facilities are necessary to provide access to the airport facilities for originating and terminating airport users. It is important that vehicular parking is adequate to serve the needs of all airport users. Peak hour demand estimates were developed in Chapter 2 and were used to determine vehicle-parking requirements. The peak hour estimates would require a minimum of 10 vehicle-parking spaces for pilots, employees, visitors and passengers in the short term and 12 vehicle-parking spaces in the medium to long term. A paved automobile parking area to accommodate automobiles, courtesy vans and occasional motor coach buses is recommended.

UTILITIES

Utilities should be provided to the airport. Power has been installed at the airport and is considered to be adequate for some development; however increased power should be considered with the development of the corporate parcels. A four-inch water line should be put into place as well as sewer or septic system. The hospital is planning a sewer line to run from the new hospital to the sewer lagoon. It is recommended that the line be run beneath the runway in a utility sleeve. The sleeve should be installed during the period of the reconstruction/shift of the runway. The sewer line for the hospital should be designed with enough capacity to allow for the airport's utilization as well. Gas should initially be provided to the airport using propane tanks. Two 1,000-gallon propane tanks should be considered adequate for future development. A gas line should be stubbed from the main line running along Highway 160 when the terminal and corporate parcels are developed. Telephone service should be installed allowing multiple lines to be provided with separate numbers. Electrical power in Kayenta is provided by Navajo Tribal Utility Authority. Telephone service is provided by Navajo Communications Co. Inc. Water and sewer services are provided by the Navajo

Utility Authority. All installation of future utilities should consider the corporate parcels and the possible demand, which may exist.

Weather Reporting

It is recommended that an Automated Weather Observation System (AWOS) be installed. AWOS uses various sensors, a voice synthesizer and a radio transmitter to provide real-time weather data. There are four types of AWOS. An AWOS-A only reports altimeter setting while an AWOS-1 also measures and reports wind speed, direction, gust, temperature and dew point. AWOS-2 provides visibility information in addition to everything reported by an AWOS-1. The most capable system, the AWOS-3, also includes cloud and ceiling data. The AWOS transmits over VHF frequency or the voice portion of a navaid. The transmission can be received within 25 nautical miles of the site or above 3,000 feet above ground level (AGL). The frequencies for AWOS are published on Aeronautical charts as well as in airport facility directories. The AWOS can also be implemented into the telephone service therefore allowing transient pilots to check current conditions at the airport before departure. An AWOS 3 requires a 1,000' diameter clear area this would require the airport to acquire more property.

Fencing

Fencing at the Kayenta Airport consists of perimeter fencing and a cattle guard; however there is unrestricted access to the runway via the entrance road. Chain-link fences and electric security access gates should be installed to bolster security in the apron area. Fencing design should incorporate sediment control to avoid sand drifts and fence line breaches by cattle.

Fuel Facilities

Retail fuel is not available at the Kayenta Airport, however consideration should be given to provide AV-Gas as well as Jet fuel. Providing fuel facilities will allow air tour operators a fuel stop, as well as making Kayenta a fuel stop for traffic flying through the Kayenta area. A fuel concession would also generate revenue for the airport sponsor.

Aircraft Rescue and Fire Fighting (ARFF)

Airport Rescue and Fire Fighting (ARFF) equipment is not required at airports that serve scheduled passenger service with aircraft having 10 or less passenger seats. Local municipal or volunteer fire departments typically provide fire protection to general aviation airports in their district. Mutual aid agreements may also be provided for nearby fire departments to assist in emergency situations. In any case, procedures should be in place to ensure emergency response in case of an accident or emergency at the airport. Although statistically very safe, the most likely emergency situations at general aviation airports are an aircraft accident, fuel or aircraft fire or hazardous material (fuel) spill. The level of protection recommended in FAA Advisory Circular 150/5210-6D, Aircraft Fire and Rescue Facilities and Extinguisher Agents, for small general aviation airports is 190 gallons of aqueous film forming foam (AFFF) supplemented with 300 pounds of dry chemical. Proximity suits should be utilized for fire fighter protection. Aviation rated fire extinguishers should be immediately available in the vicinity of the aircraft apron and fueling facilities. Adequate facilities should be provided to store any ARFF vehicle(s) or equipment that is acquired.

Currently, the Kayenta Fire Department responds to emergencies at the airport. It is recommended that the Kayenta Fire Department meet the recommendation in FAA Advisory Circular 150/5210-6D.

Land Acquisition/Releases

The airport should consider releasing the property within a 280' strip running along the north side of Highway 160. The property could be released and zoned commercial allowing for more business growth for Kayenta. The FAA requires that property to be released must show no signs of being used for aeronautical uses and all revenue generated from the release must be used for airport purposes. The airport should also obtain an avigation easement for the future RPZ that is to extend over the Township boundary into the Kayenta Chapter property. The easement should prevent development that is considered to be incompatible as well as include a height restriction on the property. By implementing an avigation easement as well as zoning regulations the airport will be protected from encroachment and uses that are considered non-compatible with the airport.

DESIGN STANDARDS

As previously discussed, the ARC system relates airport design criteria to the operational and physical characteristics of the critical aircraft intended to operate at the airport. FAA AC 150/5300-13, *Airport Design*, establishes design standards for airports based on its airport reference code. Kayenta Airport has an existing ARC of B-II. Table 3-4 shows the existing and future design standards for this category of airport.

TABLE 3-4 SUMMARY OF DIMENSIONAL STANDARDS

	Existing	Future
Design Criteria	5/23	5/23
Airport Reference Code	B-II	B-II
Approach Type	Visual	Non-Precision
Runway centerline to parallel taxiway centerline	240'	240'
Runway centerline to edge of aircraft apron	250' (350' actual)	250'
Runway width	75'	75'
Runway shoulder width	10'	10'
Runway Safety Area width	150'	150'
Runway Safety Area length beyond runway end	300'	300'
Runway Object Free Area width	500'	500'
Runway Object Free Area length beyond runway	300'	300'
Runway Obstacle Free Zone width	400'	400'
Runway Obstacle Free Zone beyond runway	200'	200'
Runway Protection Zone	500' x 700' x 1,000'	500' x 700' x 1,000'
Taxiway width	35'	35'
Taxiway Safety Area width	79'	79'
Taxiway Object Free Area width	131'	131'
Taxilane Object Free Area width	115'	115'
Runway centerline to aircraft hold lines	200'	200'
Part 77 Airspace Surfaces		
Primary Surface width	250'	500'
Primary Surface length beyond runway ends	200'	200'
Approach Surface Dimensions	250' x 1,250' x 5,000'	500' x 3,500' x 10,000'
Approach Surface slope	20:1	34:1
Transitional Surface slope	7:1	7:1

LAND USE COMPATIBILITY AND CONTROL

HEIGHT RESTRICTION ZONING

Areas around airports can pose certain hazards to air navigation if appropriate steps are not taken to ensure that buildings and other structures do not penetrate the FAR Part 77 imaginary surfaces described in Chapter 1. In order to mitigate potential hazards, the FAA recommends that airport sponsors implement compatible land use and height restriction zoning in the vicinity of the airport. A recommended Compatible Land Use and Height Restriction Zoning Ordinance is included in the Appendix of this report.

COMPATIBLE LAND USE ZONING

In addition to ensuring that the FAR Part 77 surfaces are free from current and future obstructions, it is recommended that the airport sponsor make every effort to protect the areas in the vicinity of the airport from incompatible development. Incompatible development includes those land uses which would be sensitive to aircraft noise or overflight, such as residences, schools, churches and hospitals and those uses which could attract wildlife and cause a hazard to aircraft operations such as landfills, ponds and wastewater treatment facilities.

The FAA states in FAA AC 150/5200-33, Hazardous Wildlife Attractants On or Near Airports, that landfills and transfer stations are incompatible land uses with airports. Therefore, these types of facilities should be located at least 5,000 feet from any point on a runway that serves piston type aircraft and 10,000 feet from any point on a runway that serves turbine type aircraft. Furthermore, any facility which may attract wildlife, especially birds, such as sewage treatment ponds and waste water treatment plants, should also be located this same distance from any point on a runway. Water retention in the lower areas of the adjacent gravel pits must be closely monitored, as these may become a possible attractant for birds. Development proposals should also be reviewed to ensure compatibility in the vicinity of the airport.

The purpose of zoning is to maximize the compatibility of land uses in the vicinity of the airport by enhancing safety and minimizing noise exposure for persons on the ground and enhancing safety for aircraft operators. This is accomplished by regulating those uses near the airport which result in:

- The congregation of people;
- The presence of flammable, explosive or hazardous material;
- The presence of objects that could worsen the effects of an aircraft mishap; and/or
- The presence of vertical objects that could cause a hazard in navigable airspace.

Zoning should be enacted by the Township of Kayenta to preclude potential flight hazards or incompatible land uses. A recommended Compatible Land Use and Height Restriction Zoning Ordinance is included in the Appendices of this report.

SUMMARY OF FACILITY REQUIREMENTS

In summary, the facility requirements for Kayenta Airport are based on the types and volume of aircraft expected to use the airport in the short and long-term timeframes. These facilities will enable the airport to serve its users in a safe and efficient manner. The recommended airside and landside facilities are summarized in Table 3-5.

TABLE 3-5 SUMMARY OF AIRPORT FACILITY REQUIREMENTS

	Facility	Existing	Recommended
		5/23	5/23
Runway			
	Length	7,100'	7,100'
	Width	75'	75'
	Strength (000)	12.5 SWG	30 SWG/45 DWG
Taxiways			
	Type	Stub Turnaround and connector	Full length Parallel
	Width	35'	35'
	Strength (000)	Same as RW	Same as RW
Navaids			
	Approaches	Visual	GPS
Lighting & Visual Aids			
	Runway Edge	MIRL	MIRL
	Taxiway/Apron	MITL	Retroreflectors
	REILs	No	Yes
	Approach Slope Indicator	VASI	PAPI
	Segmented Circle/Wind Cone/Beacon	Yes	Yes
	MALSR	No	No
Access & Parking			
	Automobile	6 (dirt)	12 (paved)
Hangar Facilities & Tiedowns			
	T-Hangars	0	6
	Conventional Box	0	3
	Tiedowns	10	27
Fuel Storage			
	100 LL (gallon)	None	Yes
	Jet-A (gallon)	None	Yes
	Fuel Service	None	24-hour
Other			
	AWOS	No	Yes
	Unicom	Yes	Yes
Terminal			
	Pilot and Passenger Lounge	None	1,500 S.F.