KINGMAN AIRPORT

Chapter Three

FACILITY REQUIREMENTS

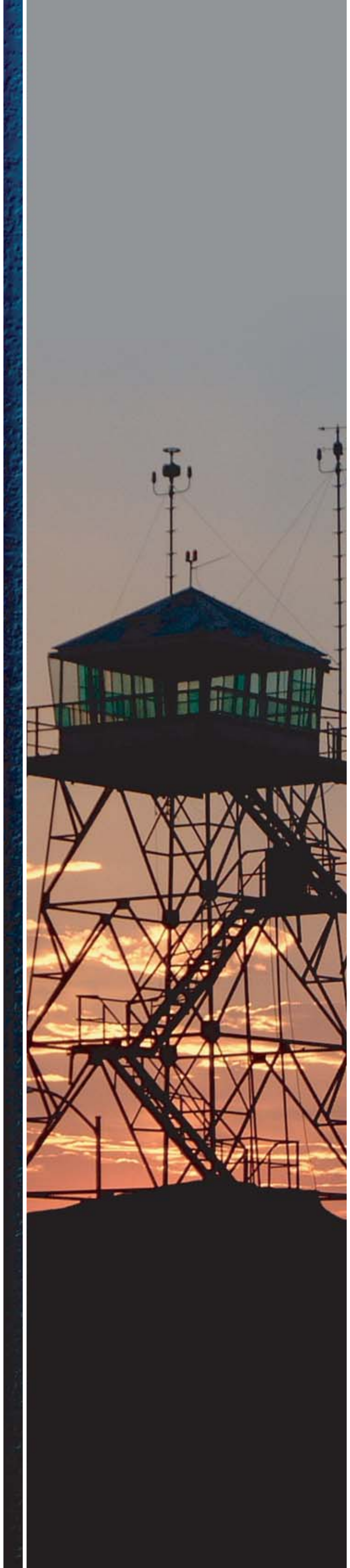
FACILITY REQUIREMENTS

To properly plan for the future of Kingman Airport, it is necessary to translate forecast aviation demand into the specific types and quantities of facilities that can adequately serve this identified demand. This chapter uses the results of the forecasts conducted in Chapter Two, as well as established planning criteria to determine the airfield (i.e., runways, taxiways, navigational aids, marking and lighting) and landside (i.e., hangars, terminal building, aircraft parking apron) facility requirements.

The objective of this effort is to identify, in general terms, the adequacy of the existing airport facilities, outline what new facilities may be needed, and when these may be needed to accommodate forecast demands. Having established these facility requirements, alternatives for providing these facilities will be evaluated in Chapter Four to determine the most cost-effective and efficient means for implementation.

The cost-effective, efficient, and orderly development of an airport should rely more upon actual demand at an airport than on a time-based forecast figure. In order to develop a Master Plan that is demand-based rather than time-based, a series of planning horizon milestones have been established for Kingman Airport that take into consideration the reasonable range of aviation demand projections prepared in Chapter Two. It is important to consider that the actual activity at the airport may be higher or lower than projected activity levels.

KINGMAN AIRPORT



By planning according to activity milestones, the resultant plan can accommodate unexpected shifts or changes in the area's aviation demand.

The most important reason for utilizing milestones is that they allow the airport to develop facilities according to need generated by actual demand levels. The demand-based schedule provides flexibility in development, as development schedules can be slowed or expedited according to actual demand at any given time over the planning period. The resultant plan provides airport officials with a financially responsible and needs-based program. **Table 3A** presents the planning horizon milestones for each activity demand category.

TABLE 3A
Planning Horizon Activity Levels

	Historical	Short Term Planning Horizon	Intermediate Term Planning Horizon	Long Term Planning Horizon
Air Carrier Activity				
Enplaned Passengers	2,313	5,400	6,800	15,000
Annual Operations	1,582	2,800	2,900	3,800
General Aviation Activity				
Based Aircraft	112	130	150	200
Annual Operations	45,320	52,700	61,500	85,000
Air Taxi Operations	5,300	6,000	6,300	7,100
Stored Aircraft	152	175	175	175
Total Annual Operations	47,980	56,700	65,800	90,700

AIRFIELD REQUIREMENTS

Airfield requirements include the need for those facilities related to the arrival and departure of aircraft. These facilities are comprised of the following items:

- Runways
- Taxiways
- Navigational Aids
- Airfield Lighting and Marking

The adequacy of existing airfield facilities at Kingman Airport is analyzed from a number of perspectives within each of these components, including (but not limited to): airfield capacity, runway length, runway pavement strength, Federal Aviation Administration (FAA) design standards, airspace configuration, and air traffic control.

AIRFIELD CAPACITY

A demand/capacity analysis measures the capacity of the airfield facilities (i.e., runways and taxiways) in order to identify a plan for additional development needs. The capacity of the airfield is affected by several factors, including airfield layout, meteorological conditions, aircraft mix, runway use, aircraft arrivals, aircraft touch-and-go activity, and exit taxiway locations. An airport's airfield capacity is expressed in terms of its annual service volume (ASV). Annual service volume is a reasonable estimate of the maximum level of aircraft operations that can be accommodated in a year.

Pursuant to FAA guidelines detailed in the FAA Advisory Circular (AC) 150/5060-5*, Airport Capacity and Delay*, the annual service volume of a two- runway configuration normally exceeds 230,000 operations. Since the forecasts for the airport indicate that activity throughout the planning period will remain below 230,000 annual operations, the capacity of the existing airfield system will not be reached, and the airfield is expected to meet operational demands. Therefore, no additional runways are needed for capacity reasons.

RUNWAY ORIENTATION

For the operational safety and efficiency of an airport, it is desirable for the primary runway of an airport's runway system to be oriented as close as possible to the direction of the prevailing wind. This reduces the impact of wind components perpendicular to the direction of travel of an aircraft that is landing or taking off (defined as a crosswind).

FAA design standards specify that additional runway configurations are needed when the primary runway configuration provides less than 95 percent wind coverage at specific crosswind components. The 95 percent wind coverage is computed on the basis of crosswinds not exceeding 10.5 knots for small aircraft weighing less than 12,500 pounds and from 13 to 16 knots for aircraft weighing over 12,500 pounds.

The airport is presently served by primary Runway 3-21 (oriented in a northeast-southwest direction) and Runway 17-35 (oriented in a north-south direction). **Table 3B** summarizes the wind coverage for the closest reporting station to Kingman Airport. As shown in the table, neither Runway 3-21 nor Runway 17-35 meet or exceed the minimum 95 percent wind coverage established by the FAA for crosswinds of 10.5 knots. Runway 3-21 meets the wind coverage requirements for crosswind components greater than 13 knots. Therefore, two runway orientations are needed at Kingman Airport. The combined wind coverage exceeds 95 percent for all crosswind components. Based on this analysis, the runway system at the airport is properly oriented to prevailing wind flows and aircraft operational safety is maximized. No additional runway orientations are needed at Kingman Airport.

TABLE 3B Wind Coverage Summary All-Weather Conditions				
	10.5 knots	**13 knots**	**16 knots**	**20 knots**
Runway 3-21	93.26%	96.09%	98.59%	99.58%
Runway 17-35	88.22%	94.33%	98.35%	99.69%
Combined Coverage	97.64%	99.06%	99.71%	99.92%
Source: NOAA National Climatic Center – Asheville, North Carolina.				

PHYSICAL PLANNING CRITERIA

The selection of appropriate Federal Aviation Administration (FAA) design standards for the development and location of airport facilities is based primarily upon the characteristics of the aircraft which are currently using or are expected to use the airport. Planning for future aircraft use is of particular importance since design standards are used to plan separation distances between facilities. These standards must be determined now since the relocation of these facilities will likely be extremely expensive at a later date.

The FAA has established a coding system to relate airport design criteria to the operational and physical characteristics of aircraft expected to use the airport. This code, the airport reference code (ARC), has two components. The first component, depicted by a letter, is the aircraft approach speed (operational characteristic); the second component, depicted by a Roman numeral, is the airplane design group and relates to aircraft wingspan (physical characteristic). Generally, aircraft approach speed applies to runways and runway-related facilities, while aircraft wingspan primarily relates to separation criteria involving taxiways, taxilanes, and landside facilities.

According to FAA Advisory Circular 150/5300-13, *Airport Design*, an aircraft's approach category is based upon 1.3 times its stall speed in landing configuration at that aircraft's maximum certificated weight. The five approach categories used in airport planning are as follows:

Category A: Speed less than 91 knots.
Category B: Speed 91 knots or more, but less than 121 knots.
Category C: Speed 121 knots or more, but less than 141 knots.
Category D: Speed 141 knots or more, but less than 166 knots.
Category E: Speed greater than 166 knots.

The airplane design group (ADG) is based upon the aircraft's wingspan. The six ADGs used in airport planning are as follows:

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 or greater.

Exhibit 3A provides a listing of typical aircraft and their associated ARC. The FAA advises designing airfield facilities to meet the requirements of the airport's most demanding aircraft, or critical aircraft. In order to determine facility requirements, an ARC should first be determined, and then appropriate airport design criteria can be applied. This begins with a review of aircraft currently using the airport and those expected to use the airport through the planning period.

Kingman Airport is currently used by a wide variety of aircraft, ranging from aircraft used for scheduled airline service to general aviation recreational aircraft, general aviation business aircraft, and a limited number of helicopters. Helicopters are not included in this determination as they are not assigned an ARC.

Commercial Aircraft

The primary aircraft used for scheduled airline service is the 19-seat Beechcraft 1900 turboprop aircraft. This aircraft falls within ARC B-II. The aviation demand forecasts noted the potential to shift to larger turboprop and regional jet aircraft as the air service market expands. Larger seating capacity turboprops include the DeHavilland Dash-8 (ARC B-III), Bombardier Q series of aircraft (ARC B-III) and Embraer and Canadair regional jets (ARC C-II).

For planning purposes, an increase in the size of air cargo aircraft is anticipated. While a forecast of enplaned air cargo has not been prepared, enplaned air cargo can be expected to grow through the planning period as the local economy grows and new industries are developed in the region. It is expected that air cargo service would continue to be regional in nature, with feeder cargo aircraft continuing to serve nearby hub airports. This would limit the size of aircraft to multi-engine piston and turboprop aircraft. A wide variety of piston engine and turboprop aircraft could be used in air cargo service; however, it is not expected that this would include aircraft larger than ARC B-II.

Taking into consideration the potential changes in scheduled airline and air cargo aircraft, the critical commercial aircraft are expected to fall within ARC C-II. This accounts for the potential introduction of regional jet aircraft in the market.

General Aviation

General aviation aircraft using the airport include small single and multi-engine aircraft, which fall within approach categories A and B and ADG I, and business turboprop and jet aircraft, which fall within approach categories B, C, and D and ADGs I and II. The majority of based aircraft fall within ARC A-I and ARC B-I. Representative based aircraft include the Cessna 210 and Beechcraft Bonanza.

A wide range of transient business jets operate at the airport. These include aircraft within the Cessna Citation family of business jets, Gulfstream business jets, Learjet, and Raytheon jet aircraft. Based upon data available from the FAA, there were an estimated 300 operations by business jet aircraft in 2003.

When compared with the single and multi-engine piston aircraft, and business turboprop aircraft, business jets are the most demanding general aviation aircraft to operate at the airport. This is due to their longer wing span, higher approach speed, and higher landing and takeoff weights. Therefore, business jet aircraft comprise the critical design aircraft for the general aviation segment of activity at the airport. Presently, the critical business jets fall within ARC C-II. The aviation demand forecasts projected business jet activity to increase through the planning period. Therefore, it is expected that activity within Approach Category D would increase in the future.

Stored Aircraft

A business located on the airport provides aircraft maintenance and storage services to the airline and air cargo industry. In 2003, there were approximately 152 aircraft stored at Kingman Airport. This included a wide range of aircraft, from turboprop aircraft within ARC B-II to large transport jet aircraft in ARC C-III, C-IV. It is expected in the future that large transport aircraft would continue to be part of the storage and maintenance mix. For stored aircraft, the critical design aircraft is ARC C-III. This covers the DC-9, MD-80, and 737 series aircraft.

Critical Design Aircraft Conclusion

For planning purposes, stored aircraft up to ARC C-III define the airport's critical aircraft. These are the largest and most demanding aircraft to operate at the airport. While these aircraft conduct only limited operations at the airport, their wingspan and landing gear configurations are vastly different than the remaining segments of activity at the airport. The wingspan and landing gear configurations of the transport aircraft become critical for the proper separation distances between the runway and taxiways, and taxiways and landside facilities. The landing gear configurations and width between landing gear struts contributes to the design width of the runways and taxiways. Business jets share the same approach speeds with the larger transport jets that will use the airport for storage and maintenance activities. Some larger business jets such as the Global Express and Gulfstream V fall within ADG III.

ARC C-III design requirements have been applied to Kingman Airport since the 1991 Master Plan. This review of the critical design aircraft confirms the need to continue to plan airfield facilities to ARC C-III.

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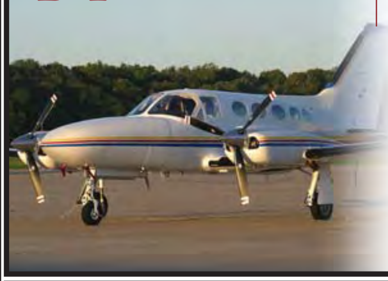
A-I

- Beech Baron 55
- **Beech Bonanza**
- Cessna 150
- Cessna 172
- Piper Archer
- Piper Seneca

C-I, D-I

- **Lear** 25, **35**, 55
- Israeli Westwind
- HS 125

B-I less than 12,500 lbs.



- Beech Baron 58
- Beech King Air 100
- Cessna 402
- **Cessna 421**
- Piper Navajo
- Piper Cheyenne
- Swearingen Metroliner
- Cessna Citation I

C-II, D-II

- **Gulfstream** II, III, **IV**
- Canadair 600
- Canadair Regional Jet
- Lockheed JetStar
- Super King Air 350

B-II less than 12,500 lbs.

- **Super King Air 200**
- Cessna 441
- DHC Twin Otter

C-III, D-III

- Boeing Business Jet
- B 727-200
- **B 737-300 Series**
- MD-80, DC-9
- Fokker 70, 100
- A319, A320
- Gulfstream V
- Global Express

B-I, II over 12,500 lbs.

- Super King Air 300
- Beech 1900
- Jetstream 31
- Falcon 10, 20, 50
- Falcon 200, 900
- **Citation** II, **III**, IV, V
- Saab 340
- Embraer 120

C-IV, D-IV

- **B-757**
- B-767
- DC-8-70
- DC-10
- MD-11
- L1011

A-III, B-III

- DHC Dash 7
- **DHC Dash 8**
- DC-3
- Convair 580
- Fairchild F-27
- ATR 72
- ATP

D-V

- **B-747** Series
- B-777

Note: Aircraft pictured is identified in bold type.

Exhibit 3A
AIRPORT REFERENCE CODES

Runway 3-21 provides the greatest length at the airport and presently serves as the primary runway for large aircraft. This runway should ultimately consider ARC C-III design requirements. The wind analysis indicated that a crosswind runway was needed for crosswind components to 10.5 knots. This includes aircraft through ARC B-II. Therefore, ARC B-II planning standards should be used in the ultimate design and construction of crosswind Runway 17-35.

The design of taxiway and apron areas should consider the wingspan requirements of the most demanding aircraft to operate within that specific functional area on the airport. The airfield taxiways and main transient apron area should consider ADG III design requirements to accommodate the wingspan requirements of business jet aircraft. Other transient general aviation apron and aircraft maintenance and repair hangar areas should consider ADG II requirements to accommodate larger piston and turboprop aircraft, as well as typical business jet aircraft. T-hangar and small conventional hangar areas should consider ADG I requirements as these commonly serve smaller single and multi-engine piston aircraft.

AIRFIELD SAFETY STANDARDS

The FAA has established several imaginary surfaces to protect aircraft operational areas and keep them free from obstructions that could affect the safe operation of aircraft. These include the object free area (OFA), obstacle free zone (OFZ), runway protection zone (RPZ), and runway safety area (RSA).

The OFA is defined as "a two-dimensional ground area surrounding runways, taxiways, and taxilanes, which is clear of objects except for objects whose location is fixed by function." The RSA is "a defined surface surrounding the runway prepared or suitable for reducing the risk of damage to airplanes in the event of an undershoot, overshoot, or excursion from the runway." The OFZ is a "defined volume of airspace centered above the runway centerline whose elevation is the same as the nearest point on the runway centerline and extends 200 feet beyond each runway end." The RPZ is a two-dimensional trapezoidal-shaped surface located along the extended runway centerline to protect people and property on the ground. The FAA expects these areas to be under the control of the airport and free from obstructions.

The dimensional requirements for ARC-III are summarized on **Table 3C** and **Exhibit 3B**. A cursory review of these design requirements at Kingman Airport indicates that these design requirements are fully met. A project in 2003 improved the Runway 3-21 RSA to meet ARC C-III standards. Design standards will be more fully reviewed within the Alternatives Analysis (Chapter Four).

The current RPZ requirements are met on existing airport property. The alternatives analysis will examine future RPZ land acquisition needs considering the design standard and upgraded instrument approach recommendations of this Master Plan.

TABLE 3C **Airfield Safety Area Dimensional Standards (ft.)**	
	C-III
Runway Safety Area	
Width	400
Length Beyond Runway End	1,000
Object Free Area	
Width	800
Length Beyond Runway End	1,000
Precision Object Free Area	
Width	800
Length Beyond Runway End	200
Obstacle Free Zone	
Width	400
Length Beyond Runway End	200
Source: FAA Airport Design Software Version 4.2D, Change 7 to AC 150/5300-13	

Runway Length

Runway length requirements are based upon five primary elements: airport elevation, the mean maximum daily temperature of the hottest month, runway gradient, critical aircraft type expected to use the runway, and the stage length of the longest non-stop trip destination.

Aircraft performance declines as elevation, temperature, and runway gradient factors increase. For calculating runway length requirements at Kingman Airport, elevation is 3,446 feet above mean sea level (MSL); the mean maximum daily temperature of the hottest month is 97.1 degrees Fahrenheit. Runway end elevations vary by 17 feet (Runway 3-21) and 89 feet (Runway 17-35).

In examining runway length requirements at the airport, the primary runway should be designed to accommodate the most demanding aircraft currently serving the airport, as well as aircraft expected to serve the airport in the future. Business jets will be the most demanding aircraft for runway length determinations at the airport. These aircraft are most likely desiring to operate at maximum payload to carry both passengers and fuel to their destination. While the stored aircraft are critical for design standard considerations, these aircraft will rarely be operating at maximum takeoff weights, as they will not be carrying passengers or cargo.

Business jets are most affected by the existing runway length, especially during the warm summer months when payload must be reduced to meet takeoff requirements. Business jets may reduce payload at the airport during the warm summer months to be able to depart on the available runway lengths at the airport. Long term facility planning should consider providing additional runway length for longer stage length flights should

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EXISTING	SHORT TERM NEED	LONG TERM NEED
RUNWAYS		
Runway 3-21 ARC C-II • 6,831' x 150' 45,000 SWL • 85,000 DWL 125,000 DTWL • 265,000 DDTWL ***Runway Safety Area*** 200' each side of runway centerline 1,000' beyond each runway end ***Object Free Area*** 400' each side of runway centerline 1,000' beyond each runway end ***Runway Protection Zone Each End*** Inner Width - 500' • Outer Width - 1,010' Length - 1,700'	Runway 3-21 ARC C-III • 6,831' x 150' 45,000 SWL • 85,000 DWL 125,000 DTWL • 265,000 DDTWL ***Runway Safety Area*** 200' each side of runway centerline 1,000' beyond each runway end ***Object Free Area*** 400' each side of runway centerline 1,000' beyond each runway end ***Runway Protection Zone Each End*** Inner Width - 500' • Outer Width - 1,010' Length - 1,700'	Runway 3-21 ARC C-III • 7,000' x 150' 45,000 SWL • 85,000 DWL 125,000 DTWL • 265,000 DDTWL ***Runway Safety Area*** 250' each side of runway centerline 1,000' beyond each runway end ***Object Free Area*** 400' each side of runway centerline 1,000' beyond each runway end ***Precision Object Free Area*** 400' each side of runway centerline 200' beyond each runway end ***Runway Protection Zone Primary End*** Inner Width - 1,000' • Outer Width - 1,750' Length - 2,500' ***Runway Protection Zone Other End*** Inner Width - 500' • Outer Width - 1,010' Length - 1,700'
Runway 17-35 ARC B-II • 6,725' x 75' 22,000 SWL • 60,000 DWL ***Runway Safety Area*** 75' each side of runway centerline 300' beyond each runway end ***Object Free Area*** 250' each side of runway centerline 300' beyond each runway end ***Runway Protection Zone Each End*** Inner Width - 500' • Outer Width - 700' Length - 1,000'	Runway 17-35 ARC B-II • 6,725' x 75' 22,000 SWL • 60,000 DWL ***Runway Safety Area*** 75' each side of runway centerline 300' beyond each runway end ***Object Free Area*** 250' each side of runway centerline 300' beyond each runway end ***Runway Protection Zone Each End*** Inner Width - 500' • Outer Width - 700' Length - 1,000'	Runway 17-35 ARC B-II • 6,725' x 75' 22,000 SWL • 60,000 DWL ***Runway Safety Area*** 75' each side of runway centerline 300' beyond each runway end ***Object Free Area*** 250' each side of runway centerline 300' beyond each runway end ***Runway Protection Zone Each End*** Inner Width - 500' • Outer Width - 700' Length - 1,000'
TAXIWAYS		
Runway 3-21 Full-length Parallel Taxiway A - 75' wide 522.5' from runway centerline Taxiway D1 - 150' wide Taxiway D2 - 75' wide Taxiway D3 - 75' wide Taxiway D4 - 150' wide	Runway 3-21 Full-length Parallel Taxiway A - 75' wide 522.5' from runway centerline Taxiway D1 - 150' wide Taxiway D2 - 75' wide Taxiway D3 - 75' wide Taxiway D4 - 150' wide **Add Exit Taxiways**	Runway 3-21 Full-length Parallel Taxiway A - 75' wide **Relocate to 400' from runway centerline** Taxiway D1 - 150' wide Taxiway D2 - 75' wide Taxiway D3 - 75' wide Taxiway D4 - 150' wide **Reserve for east full-length parallel taxiway**
Runway 17-35 Partial Parallel Taxiway C - 75' wide 522.5' from runway centerline Taxiway C1 - 150' wide Taxiway A - 75' wide Taxiway B - 75' wide	Runway 17-35 Partial Parallel Taxiway C - 75' wide 522.5' from runway centerline Taxiway C1 - 150' wide Taxiway A - 75' wide Taxiway B - 75' wide **Taxiway Access to Industrial Park**	Runway 17-35 Taxiway C - 75' wide **/ Extend to Runway 35 End** **Relocate to 400' from runway centerline** Taxiway C1 - 150' wide **Add Exit Taxiways** **Reserve for east full-length parallel taxiway** Taxiway A - 75' wide Taxiway B - 75' wide **/ Extend to the west** Taxiway Access to Industrial Park
HELICOPTER OPERATIONS		
(2) Helicopter Parking Positions Along Taxiway C	(2) Helicopter Parking Positions Along Taxiway C **Transient Helipad on Main Apron** **Hardstands on Main Apron**	(2) Helicopter Parking Positions Along Taxiway C Transient Helipad on Main Apron Hardstands on Main Apron

KEY

SWL - Single wheel loading
DWL - Dual wheel loading
DTWL - Dual-tandem wheel loading
DDTWL - Double dual-tandem wheel loading

Exhibit 3B
AIRCRAFT OPERATIONAL AREA REQUIREMENTS

that be needed by specific operators at the airport. The appropriate planning category for ARC C-III is 75 percent of large aircraft at 90 percent useful load. As shown in **Table 3D**, a runway length of 7,000 feet is recommended for this category. Therefore, long term facility planning should consider an ultimate runway length of 7,000 feet for Runway 3-21.

The 1991 Master Plan and current Airport Layout Plan (ALP) depict an ultimate length of 10,000 feet on Runway 3-21. While the entire 10,000 feet cannot be justified at this time based on the existing and projected fleet mix, consideration could be given to reserving airport property to accommodate this length of runway in the future so that this property is not developed for other uses. Reserving property for a 10,000-foot runway provides flexibility in the types of businesses and operators that the airport can market to in the future. Additionally, since the ultimate length of the runway impacts airspace planning as defined in 14 CFR Part 77, and used in local height and hazard zoning, reserving the potential for a 10,000-foot runway can ensure that the surrounding communities do not construct buildings or towers that would obstruct a 10,000-foot runway approach surfaces should the need for this runway length materialize in the future. The alternatives analysis will consider the design requirements for both a 7,000-foot primary runway length, as well as a 10,000-foot ultimate runway length on Runway 3-21.

The appropriate planning category for Runway 17-35 is "Small airplanes with 10 or more passenger seats". Additional runway length is not needed on Runway 17-35 since this runway currently exceeds the minimum 5,300 feet of length recommended by the FAA.

TABLE 3D
Runway Length Requirements

AIRPORT AND RUNWAY DATA	
Airport elevation	3,446 feet
Mean daily maximum temperature of the hottest month	97.1° F
Maximum difference in runway centerline elevation	89 feet
Length of haul for airplanes of more than 60,000 pounds	500 miles
RUNWAY LENGTHS RECOMMENDED FOR AIRPORT DESIGN	
Small airplanes with 10 or more passenger seats	5,300 feet
Large airplanes of 60,000 pounds or less	
75 percent of large airplanes at 60 percent useful load	7,000 feet
100 percent of large airplanes at 60 percent useful load	9,200 feet

Reference: FAA's airport design computer software utilizing Chapter Two of AC 150/5325-4A, *Runway Length Requirements for Airport Design*, no changes included.

Runway Width

Runway width is primarily determined by the planning ARC for the particular runway. FAA design standards specify a minimum width of 150 feet for Runway 3-21 (ADG III), while a minimum of 75 feet should be provided for Runway 17-35 (ADG II). Each runway currently meets the standard established by the FAA and should satisfy future needs with normal maintenance.

Pavement Strength

The most important feature of airfield pavement is its ability to withstand repeated use by aircraft of significant weight. The current strength rating on Runway 3-21 is 45,000 pounds single wheel loading (SWL), 85,000 pounds dual wheel loading (DWL), 125,000 pounds dual tandem wheel loading (DTWL), and 265,000 pounds double dual tandem wheel loading (DDTWL). Runway 17-35 has a current strength rating of 22,000 pounds SWL and 60,000 pounds DWL. The current strength ratings on both runways are sufficient for the fleet of aircraft currently serving, and expected to serve the airport in the future.

TAXIWAYS

Taxiways are constructed primarily to facilitate aircraft movements to and from the runway system. Some taxiways are necessary simply to provide access between the aprons and runways, whereas other taxiways become necessary as activity increases at an airport to provide safe and efficient use of the airfield.

Design standards for separation between the runways and parallel taxiways are based upon the wingspan of the critical aircraft using the runway. Since this varies between the two runways, different standards apply. Runway 3-21 is served by full-length parallel Taxiway D. Taxiway D is 75 feet in width, which exceeds the 50 feet required for ARC C-III. The runway/taxiway centerline separation of 522.5 feet exceeds the requirements for ARC C-III. Consideration may be given to relocating Taxiway D to the minimum 400-foot separation distance defined in FAA design standards when a major rehabilitation of this taxiway is needed. This could allow for the development of additional aircraft parking. This will be examined in the alternatives analysis.

While ARC B-II design standards apply to Runway 17-35, aircraft through ADG III may utilize Taxiway C. Therefore, ADG III design standards should be retained for Taxiway C similar to Taxiway D. Taxiway C is currently 75 feet wide and located 538 feet from the Runway 17-35 centerline. Similar to Taxiway D, the existing width and separation distances exceed FAA design standards. Consideration may be given to relocating Taxiway C to the minimum 400-foot separation distance defined in FAA design standards, when a major rehabilitation of this taxiway is needed. This will be examined in the alternatives analysis, as will the extension of Taxiway C to the Runway 35 end.

The type and frequency of runway entrance/exit taxiways can affect the efficiency and capacity of the runway system. Right-angled exits require an aircraft to be nearly stopped before exiting the runway. Acute-angled (high-speed) exits allow aircraft to slow to a safe speed, without stopping, before exiting the runway. Additional connecting taxiways (at a minimum of 50 feet in width) should be considered. This will be examined more closely in the alternatives analysis.

Taxiway B currently extends along the southern edge of the apron. Facility planning should include extending this taxiway to the west to allow airfield access to the western portions of airport property. While not needed for airfield capacity, full-length parallel taxiways should be considered on the southeast and south sides of Runway 3-21 and Runway 17-35, respectively. Future landside development on the east side of the airport may require airfield access. Planning for a parallel taxiway for these runways will ensure that future landside facilities developed in these areas consider the separation distances needed for this taxiway. Consideration for taxiway access to the adjacent industrial park should also be considered.

HELIPADS

The airport does not have a designated helipad on the main apron area. Helicopters utilize the same areas as fixed-wing aircraft. Helicopter and fixed-wing aircraft should be segregated to the extent possible. Facility planning should include establishing a designated transient helipad at the airport. Helipads are available along the Bureau of Land Management (BLM) area. These helipads should be maintained through the planning period.

NAVIGATIONAL AND APPROACH AIDS

Navigational aids are electronic devices that transmit radio frequencies which properly equipped aircraft and pilots translate into point-to-point guidance and position information. The types of electronic navigational aids available for aircraft flying to or from Kingman Airport include the Kingman very high frequency omnidirectional range (VOR) facility, global positioning system (GPS), and Loran-C. These systems are sufficient for navigation to and from the airport; therefore, no other navigational aids are needed at the airport.

Instrument Approach Procedures

Instrument approach procedures have been established for the airport using the VOR and GPS navigational aids. Instrument approach procedures consist of a series of predetermined maneuvers established by the FAA for navigation during inclement weather conditions. The current instrument approach procedures only provide course guidance information to the pilot.

Appendix 16 of FAA AC 150/5300-13, *Airport Design*, Change 7, details the minimum airport landing surface requirements that must be met prior to the establishment of a new instrument approach procedure. This appendix details the requirements for three types of instrument approach procedures: precision instrument approaches, approach procedures with vertical guidance (APV), and nonprecision approaches. While both the precision instrument and APV will provide descent and course guidance information, the precision approach provides the best approach minimums (visibility less than 3/4 mile and 200-foot cloud ceilings). The APV can provide similar visibility minimums, but cloud ceiling minimums only to 250 feet. The APV is applicable to any approach using GPS. Nonprecision approaches can provide for approaches with visibility minimums less than 3/4 mile and 300-foot cloud ceilings.

Since both course guidance and descent information is desirable for an instrument approach to Kingman Airport and GPS does not require the installation of costly navigation equipment at the airport, both a precision GPS approach and an APV approach should be planned for Kingman Airport. The Arizona Department of Transportation - Aeronautics Division's (ADOT), *Navigational Aids and Aviation Services Special Study*, supported the development of a precision approach to Runway 21 at Kingman Airport. APV approaches should be planned for the remaining runway ends.

A review of Appendix 16 indicates that the existing airport site can support an APV with visibility minimums of one mile and cloud ceilings as low as 300 feet. Lower visibility and cloud ceiling minimums would require an approach lighting system and precision runway markings. These lighting and marking improvements will be detailed later within this chapter.

AIRFIELD MARKING, LIGHTING, AND SIGNAGE

There are a number of lighting and pavement marking aids serving pilots using the Kingman Airport. These lighting and marking aids assist pilots in locating the airport during night or poor weather conditions, as well as assist in the ground movement of aircraft. **Exhibit 3C** summarizes the existing lighting aids and presents future requirements.

Identification Lighting

The location of an airport at night is universally indicated by a rotating beacon. The rotating beacon at the airport is located south of Taxiway A near the center of the runway system. The rotating beacon is sufficient and should be maintained in the future.

Runway and Taxiway Lighting

Both runways are equipped with medium intensity runway lighting (MIRL), which will be adequate through the planning period. Parallel Taxiways A, C, and D are equipped with medium intensity taxiway lighting (MITL). Taxiway B has no light-

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EXISTING	SHORT TERM NEED	LONG TERM NEED
INSTRUMENT APPROACH PROCEDURES		
VOR/DME Runway 21 1 mile visibility, 400' cloud ceiling minima Approach Categories A, B, and C 1.25 mile visibility, 400' cloud ceiling minima Approach Category D **GPS Runway 3** 1 mile visibility, 500' cloud ceiling minima Approach Categories A and B 1.25 mile visibility, 500' cloud ceiling minima Approach Category C 1.5 mile visibility, 500' cloud ceiling minima Approach Category D **GPS Runway 21** 1 mile visibility, 400' cloud ceiling minima Approach Categories A, B, and C 1.25 mile visibility, 400' cloud ceiling minima Approach Category D	**No Changes**	**Precision Approach** Runway 21 Approach Categories A, B, C, and D One-Half Mile Visibility Minimum 200' Cloud Ceilings **Straight-in GPS Approach** Runway 17-35 Approach Categories A, B, C, and D 1 mile visibility minimum 400' cloud ceilings
AIRFIELD LIGHTING AND MARKINGS		
Rotating Beacon Pilot Controlled Lighting <u>Runway 3-21</u> Medium Intensity Runway Edge Lighting Medium Intensity Taxiway Edge Lighting Lighted Runway/Taxiway Directional Signage Precision Approach Path Indicator - 4 Runway 3 and Runway 21 Runway End Identifier Lights Runway 3 and Runway 21 Nonprecision Runway Markings Distance Remaining Signs <u>Runway 17-35</u> Medium Intensity Runway Edge Lighting Medium Intensity Taxiway Edge Lighting Lighted Runway/Taxiway Directional Signage Precision Approach Path Indicator - 2 Runway 17 and Runway 35 Basic Runway Markings	Rotating Beacon Pilot Controlled Lighting <u>Runway 3-21</u> Medium Intensity Runway Edge Lighting Medium Intensity Taxiway Edge Lighting Lighted Runway/Taxiway Directional Signage Precision Approach Path Indicator - 4 Runway 3 and Runway 21 Runway End Identifier Lights Runway 3 and Runway 21 Nonprecision Runway Markings Distance Remaining Signs <u>Runway 17-35</u> Medium Intensity Runway Edge Lighting Medium Intensity Taxiway Edge Lighting Lighted Runway/Taxiway Directional Signage Precision Approach Path Indicator - 2 Runway 17 and Runway 35 **Runway End Identifier Lights** **Runway 17 and Runway 35** Basic Runway Markings	Rotating Beacon Pilot Controlled Lighting <u>Runway 3-21</u> Medium Intensity Runway Edge Lighting Medium Intensity Taxiway Edge Lighting Lighted Runway/Taxiway Directional Signage Precision Approach Path Indicator - 4 Runway 3 and Runway 21 **MALSR - Runway 21** Runway End Identifier Lights Runway 3 **Precision Runway Markings** Distance Remaining Signs <u>Runway 17-35</u> Medium Intensity Runway Edge Lighting Medium Intensity Taxiway Edge Lighting Lighted Runway/Taxiway Directional Signage Precision Approach Path Indicator - 2 Runway 17 and Runway 35 Runway End Identifier Lights Runway 17 and Runway 35 **Nonprecision Runway Markings**
OTHER FACILITIES		
Lighted Wind Indicator Segmented Circle Wind Tee Automated Surface Observation System (ASOS) Remote Communications Outlet (RCO)	Lighted Wind Indicator Segmented Circle Wind Tee Automated Surface Observation System (ASOS) Remote Communications Outlet (RCO)	Lighted Wind Indicator Segmented Circle Wind Tee Automated Surface Observation System (ASOS) Remote Communications Outlet (RCO)

KEY

VOR - Very High Frequency Omni-directional Rang Facility
GPS - Global Positioning System
DME - Distance Measuring Equipment
MALSR - Medium Intensity Approach Lighting System with Runway Alignment Indicator Lighting

KINGMAN AIRPORT

Exhibit 3C
AIRFIELD SUPPORT REQUIREMENTS

ing. Future planning should include the addition of MITL on Taxiways B.

Distance Remaining Signs

Runway 3-21 is equipped with lighted distance remaining signs that notify pilots of the available runway length. These are sufficient through the planning period, although they would need to be relocated if the runway is extended.

Airfield Signs

Airfield signage provides another means of notifying pilots as to their location on the airport. A system of signs placed at several airfield intersections on the airport is the best method available to provide this guidance. Signs located at intersections of taxiways provide crucial information to avoid conflicts between moving aircraft. Directional signage instructs pilots as to the location of taxiways and terminal aprons. At Kingman Airport, all signs installed at the taxiway and runway intersections are lit.

Visual Approach Lighting

In most instances, the landing phase of any flight must be conducted in visual conditions. To provide pilots with visual guidance information during landings to the runway, electronic visual approach aids are commonly provided at airports. A four-light precision approach path indicator (PAPI-4L) is installed on the approach ends of Runway 3-21, while a two-light precision approach slope indicator (PAPI-2L) is installed on the approach ends of Runway 17-35. The PAPIs are appropriate for the mix of aircraft operating at the airport and should be maintained through the planning period.

Runway End Identification Lighting

Runway end identifier lights (REILs) are flashing lights that facilitate identification of the runway end. REILs are installed on each end of Runway 3-21. As REILs provide pilots with the ability to identify the runway ends and distinguish the runway end lighting from other lighting on the airport and in the approach areas, REILs should be planned for each end of Runway 17-35.

Approach Lighting

Approach lighting systems provide the basic means to transition from instrument flight to visual flight for landing. No approach lighting system is presently installed at the airport. A future precision approach to Runway 21 would require the installation of a medium intensity approach lighting system with runway alignment lighting (MALSR). This would replace the REILs currently installed at the Runway 21 end.

Pilot-Controlled Lighting

Kingman Airport is equipped with pilot-controlled lighting (PCL). PCL allows pilots to control the intensity of runway lighting using the radio transmitter in the aircraft. PCL also provides for more efficient use of airfield lighting energy. A PCL system turns the airfield lights off or to a lower intensity when not in use. Similar to changing the intensity of the lights, pilots can turn up the lights using the radio transmitter in the aircraft. This system should be maintained through the planning period.

Pavement Markings

In order to facilitate the safe movement of aircraft about the field, airports use pavement markings, lighting, and signage to direct pilots to their destinations. Runway markings are designed according to the type of instrument approach available on the runway. FAA Advisory Circular 150/5340-1H, *Marking of Paved Areas on Airports*, provides the guidance necessary to design airport markings.

Runway 3-21 is marked as a nonprecision runway, while Runway 17-35 has basic/visual markings. If the airport secures a precision instrument landing system (ILS), then precision markings would be required on Runway 3-21. Nonprecision markings will be required on 17-35 should GPS approaches ultimately be established to this runway.

Taxiway and apron areas also require marking. Yellow centerline stripes are currently painted on all taxiway surfaces at the airport to provide this guidance to pilots. The apron areas also have centerline markings to indicate the alignment of taxilanes within these areas. Besides routine maintenance of the taxiway striping, these markings will be sufficient through the planning period.

Aircraft hold positions must all continue to be marked. By June 9, 2007, Kingman Airport will be required to have installed internally-illuminated holding position signs.

WEATHER REPORTING

The airport has a lighted wind cone and wind tee that provide pilots with information about wind conditions. A segmented circle provides traffic pattern information to pilots. These facilities are required when the airport is not served by a 24-hour ATCT. These facilities are sufficient and should be maintained in the future.

The airport is equipped with an Automated Surface Observing System (ASOS), which provides automated aviation weather observations 24 hours per day. The system updates weather observations every minute, continuously reporting significant weather changes as they occur. The ASOS system reports cloud ceiling, visibility, temperature, dew point, wind direction, wind speed, altimeter setting (barometric pressure), and density altitude (airfield elevation corrected for temperature). The ASOS should be maintained through the planning period.

COMMUNICATIONS FACILITIES

Kingman Airport is equipped with a remote communications outlet (RCO) that provides pilots with a direct communication link to the Prescott Flight Service Station. This communication link facilitates the opening and closing of flight plans and should be maintained in the future.

AIR TRAFFIC CONTROL

Kingman Airport does not have an operational airport traffic control tower (ATCT); therefore, no formal terminal air traffic control services are available at the airport.

The establishment of a fully-funded ATCT, staffed and maintained by FAA personnel, follows guidance provided in FAA Handbook 7031.2C, *Airway Planning Standard Number One - Terminal Air Navigation Facilities and Air Traffic Control Services*. To be identified as a possible candidate for an ATCT, the sum of the following formula must be greater than or equal to one. The formula is as follows:

AC +	AT +	GAI +	GAL +	MI +	ML =	X
38,000	90,000	160,000	280,000	48,000	90,000	

Where:

AC = Air Carrier Operations
AT = Air Taxi Operations
GAI = General Aviation Itinerant Operations
GAL = General Aviation Local Operations
MI = Military Itinerant Operations
ML = Military Local Operations

Using current activity levels and those forecast activity levels prepared in Chapter Two, it is expected that Kingman Airport would not qualify as a possible candidate for a fully-funded FAA ATCT due to the levels of air traffic at the airport. At 2003 activity levels, the sum of the formula above is 0.24. At long term planning horizon levels, the sum is 0.44.

Facility planning should include identifying and reserving a location for the future development of a tower, should a tower be required in the future or the community wish to participate in the FAA Contract Tower program.

LANDSIDE REQUIREMENTS

Landside facilities are those necessary for handling aircraft, passengers, and freight while on the ground. These facilities provide the essential interface between the air and ground transportation modes. The capacities of the various components of each area were examined in relation to projected demand to identify future landside facility needs.

TERMINAL AREA REQUIREMENTS

Components of the terminal area complex include the terminal apron, vehicle parking area, and the various functional elements within the terminal building. This section identifies the terminal area facilities required to meet the airport's needs throughout the planning period.

The requirements for the various terminal complex functional areas were determined with the guidance of FAA Advisory Circular 150/5360-13, *Planning and Design Guidelines for Airport Terminal Facilities*. The consultant's database for space requirements was also considered.

Facility requirements were developed for the planning period based upon the forecast enplanement levels. It should be noted that actual need for construction of facilities will be based upon enplanement levels rather than a forecast year. It is also important to note the impact that increased security is placing on facility requirements. Future requirements will include increased areas for the queuing of passengers and additional security screening equipment. The various functional areas of the terminal building are summarized as follows:

- **Ticketing -** includes estimates of the space necessary for the queuing of passengers at ticket counters, the linear footage of ticket counters, and the space necessary to accommodate baggage make-up and airline ticket offices.
- **Departure Facilities -** includes estimates of the space necessary for departure holdroom and the number of aircraft gate positions. Holdroom space and gate positions in excess of the requirements presented in the exhibit are frequently necessary to accommodate individual airline demands.
- **Baggage Claim -** includes estimates of the linear footage of baggage claim needed and space for passengers to claim baggage.
- **Rental Cars -** includes estimates of space necessary for the queuing of passengers at rental car counters, the space necessary for rental car offices, and the linear footage for rental car counters.
- **Concessions -** includes estimates of the space necessary to provide adequate concession services such as restaurant and retail facilities.
- **Security Screening -** includes estimates of the amount of space required to accommodate passenger screening devices, the queuing of passengers, and security officers' office area.
- **Public Waiting Lobby -** includes estimates of the amount of space

to accommodate arriving and departing passengers.

- **Terminal Area Automobile Parking -** space required for long-term and short-term public parking, employee parking, and rental car parking.

- **Terminal Curb Frontage** - includes estimates of the linear footage of curb required to accommodate the queuing of enplaning and deplaning passenger vehicles. At Kingman Airport, the length of the terminal curb frontage is a function of the length of the terminal building.

The methodology utilized in the analysis of the passenger terminal building involved the design hour passenger demands and a comparison of these requirements with existing terminal facilities. The evaluation process includes the major terminal building areas that are normally affected by peaking characteristics. **Exhibit 3D** depicts the existing square footage space available in the existing terminal building and compares it to the anticipated needs for each of the planning horizon levels.

As evidenced on the exhibit, a larger terminal building will be needed at the airport should enplanement levels grow. Currently, the existing terminal building is without a dedicated baggage claim and is not sufficiently sized to accommodate the secure hold room. Given the age of the building and the need to considerably increase the square-footage of the building, a replacement building must be considered. The alternatives analysis will examine the optimal location for the terminal building and its configuration.

GENERAL AVIATION REQUIREMENTS

The purpose of this section is to determine the landside space requirements for general aviation hangar and apron parking facilities during the planning period. In addition, the total surface area needed to accommodate general aviation activities throughout the planning period is estimated.

HANGARS

The demand for aircraft storage hangars typically depends upon the number and type of aircraft expected to be based at the airport. For planning purposes, it is necessary to estimate hangar requirements based upon forecast operational activity. However, hangar development should be based on actual demand trends and financial investment conditions.

Utilization of hangar space varies as a function of local climate, security, and owner preferences. The trend in general aviation aircraft, whether single or multi-engine, is in more sophisticated (and, consequently, more expensive) aircraft. Therefore, many hangar owners prefer hangar space to outside tiedowns. The climate of the regional area causes most aircraft owners to prefer inside storage. Presently, the majority of aircraft owners currently keep their aircraft in enclosed hangar space.

Future hangar requirements for the airport are summarized on **Exhibit 3E**. Future hangar requirements were developed with the assumption that a majority of aircraft owners would prefer enclosed storage and that the percentage of aircraft within enclosed hangar facilities would increase through the planning period. T-hangar requirements were determined by providing 1,200 square feet of space for aircraft within each T-hangar space. Conventional hangar space was determined by providing 1,200 square feet for single engine aircraft and 3,000 square feet for multi-engine aircraft. A larger portion of the aircraft projected for enclosed aircraft storage were anticipated to be located within conventional (clearspan) hangars, as is the current trend at the airport. For this analysis, the hangars used for large aircraft maintenance were removed from the analysis since the use of these facilities is not related to general aviation activity.

As indicated on the exhibit, additional hangar space is expected to be required through the planning period. The alternatives analysis will examine options available for hangar development at the airport and determine the best location for each type of hangar facility.

AIRCRAFT PARKING APRON

A parking apron should be provided for at least the number of locally-based aircraft that are not stored in hangars, as well as transient aircraft. There are approximately 166 tiedowns available for both based and transient aircraft at the airport. Although the majority of future based aircraft were assumed to be stored in an enclosed hangar, a number of based aircraft will still tie down outside.

Along with based aircraft parking needs, transient aircraft parking needs must also be considered in determining apron requirements. Kingman Airport accommodates a significant level of transient activity annually.

Total apron area requirements were determined by applying a planning criterion of 800 square yards per transient aircraft parking position and 500 square yards for each locally-based aircraft parking position. Transient business jet positions were determined by applying a planning criterion of 1,600 square yards for each transient business jet position. The results of this analysis are presented on **Exhibit 3E**. Based upon the planning criteria above and assumed transient and based aircraft users, the existing apron areas should be sufficient through the planning period. Additional apron area in excess of these needs may be needed as new hangar areas are developed on the airport which are not contiguous with the existing apron areas.

The tiedown spaces and apron area not used for general aviation activity are currently used for aircraft storage. This is expected to continue through the planning period. Additional heavy aircraft parking areas should be pro-

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		ENPLANEMENTS		
	EXISTING	5,400	6,800	15,000
TICKETING				
Counter Length (l.f.)	6	8	8	10
Counter Area (s.f.)	225	250	250	300
Ticket Lobby (s.f.)	82	200	200	300
Airline Operations/Bag Make-Up (s.f.)	144	200	250	300
DEPARTURE FACILITIES				
Aircraft Gates	1	1	1	1
Security Stations	1	1	1	1
Holdroom Area (s.f.)	---	200	300	450
BAGGAGE CLAIM				
Claim Display (l.f.)	0	5	5	10
Baggage Claim Lobby (s.f.)	0	200	250	350
TERMINAL SERVICES				
Rental Car				
Counter Length (l.f.)	5	5	7	10
Office Area (s.f.)	100	200	300	400
Counter Queue Area (s.f.)	100	100	150	300
Food/Beverage (s.f.)	910	900	1,200	1,500
Retail (s.f.)	0	100	100	200
Restrooms (s.f.)	135	100	150	300
PUBLIC LOBBY				
Seating/Greeting/Farewell Area (s.f.)[1]	443	500	550	600
AIRPORT/ADMINISTRATION/OFFICE SPACE	**0**	**1,200**	**1,500**	**2,000**
SUBTOTAL PROGRAMMED AREA	**2,139**	**4,150**	**5,200**	**7,000**
General Circulation	0	800	900	1,300
Mech./Elec., Maint., & Storage (s.f.)	501	600	700	1,000
TOTAL TERMINAL BUILDING	**2,640**	**5,550**	**6,800**	**9,300**
AUTO PARKING				
Public Parking	54	54	54	74
Rental Car	18	18	18	18
Total Auto Parking	**72**	**72**	**72**	**92**

[1] Included in public lobby space

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Exhibit 3D
PASSENGER TERMINAL BUILDING REQUIREMENTS

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AIRCRAFT STORAGE HANGARS (General Aviation Aircraft)

	AVAILABLE	SHORT TERM NEED	INTERMEDIATE NEED	LONG TERM NEED
Aircraft to be Hangared	73	91	113	160
T-Hangars	48	59	73	104
Conventional Hangars	25	32	39	56
Hangar Area Requirements				
T-Hangar Area (s.f.)	50,000	71,000	87,800	124,800
Conventional Hangar Storage Area (s.f.)	100,912	118,400	120,300	144,000
Total Hangar Area (s.f.)	150,912	189,400	208,100	268,800

AIRCRAFT PARKING APRON (General Aviation Aircraft)

	AVAILABLE	SHORT TERM NEED	INTERMEDIATE NEED	LONG TERM NEED
Single, Multi-engine Transient Aircraft Positions	---	22	24	35
Apron Area (s.y.)	---	17,400	19,000	27,800
Transient Business Jet Positions	---	2	4	4
Apron Area (s.y.)	---	3,900	6,700	6,200
Locally-Based Aircraft Positions	---	39	37	40
Apron Area (s.y.)	---	25,400	24,100	26,000
Total Positions	166	63	65	79
Total Apron Area (s.y.)	260,000	46,700	48,700	60,000

	AVAILABLE	SHORT TERM NEED	INTERMEDIATE NEED	LONG TERM NEED
General Aviation Terminal Facilities (s.f.)	---5,400	6,300	7,900	
General Aviation Automobile Parking	112	112	112	150
Other Facilities		Aircraft Wash Rack Airport Maintenance Building ARFF Station		Covered Aircraft Owner's Maintenance Facility/Wash Rack

ARFF - Airport Rescue & Firefighting

KINGMAN AIRPORT

Exhibit 3E

LANDSIDE FACILITY REQUIREMENTS

vided along the sides of the closed runway. This involves a technique of soil stabilization that does not require the expense of asphalt or concrete pavement.

GENERAL AVIATION TERMINAL FACILITIES

General aviation terminal facilities have several functions separate from those of the airline terminal building. Space is required for passengers waiting, pilots' lounge and flight planning, concessions, management, storage, and various other needs. This space is not necessarily limited to a single, separate terminal building, but also includes the space offered by fixed base operators for these functions and services.

The methodology used in estimating general aviation terminal facility needs was based on the number of airport users expected to utilize general aviation facilities during the design hour. General aviation space requirements were then based upon providing 120 square feet per design hour itinerant passenger. **Exhibit 3E** outlines the general aviation space requirements for general aviation terminal services at Kingman Airport. There is no dedicated general aviation terminal at Kingman Airport, although this function may be included in the future passenger terminal building configuration.

SUPPORT REQUIREMENTS

Various facilities that do not logically fall within classifications of airfield, terminal building, or general aviation facilities have been identified for inclusion in this Master Plan. Facility requirements have been identified for these remaining facilities:

- Aircraft Wash Facility
- Perimeter Fencing and Access Gates
- Airport Maintenance
- Utilities
- 14 CFR Part 139

Aircraft Wash Facility

Presently, there is not a designated aircraft wash facility on the airport. Consideration should be given to establishing an aircraft wash facility at the airport to collect aircraft cleaning fluids used during the cleaning process.

Other airports have combined an aircraft owner maintenance facility with the wash facility. This typically has involved covering the wash rack area. These areas typically provide for the collection of used aircraft oil and other hazardous materials and provide a covered area for aircraft washing and light maintenance. The development of a similar facility at Kingman Airport could reduce environmental exposure and provide an additional revenue source, which could be used to offset development costs.

Perimeter Fencing and Access Gates

The entire runway and taxiway system, along with the main apron areas, are enclosed with six-foot chain link fencing with three-strand barbed wire on top. This fencing was installed in 2003, along with automated vehicle access gates, which are operated by a keypad. These fencing systems are sufficient through the planning period.

Airport Maintenance Building

Presently, there is not a dedicated airport maintenance facility. Airport maintenance personnel utilize an existing T-hangar for equipment storage. Consideration should be given to developing a maintenance facility for the storage of maintenance equipment and to provide work areas for airport maintenance employees. Grant funding can be obtained for a 1,500 square-foot maintenance building.

Utilities

Electrical, water, natural gas, and sanitary sewer services are available at the airport. No information collected during the inventory effort revealed any deficiencies in providing electrical, water, or sanitary sewer services at the airport. Therefore, it is assumed that all future infrastructure needs for these services will be sufficiently met. Airside fire hydrants are needed for fire protection.

14 CFR Part 139 Certification Requirements

14 CFR Part 139, *Certification and Operations: Land Airports Serving Certain Air Carriers*, as amended, prescribes the rules governing the certification and operation of land airports which serve any scheduled or unscheduled passenger operation of an air carrier that is conducted with an aircraft having a seating capacity of more than 30 passengers. Presently, Kingman Airport is certificated under 14 CFR Part 139. New FAA rulemaking will require changes to the 14 CFR Part 139 program at Kingman Airport.

The new 14 CFR Part 139 regulations are effective June 9, 2004, and extend certification requirements to airports serving scheduled air carrier operations in aircraft with 10-30 seats. Kingman Airport is served by 19-seat air carrier aircraft, which requires compliance with these new rules.

Under the changes to the Part 139 requirements, there would be four classes of airports: Classes I, II, III, and IV. Airports serving all types of scheduled operations of large air carrier aircraft, and any other type of air carrier operations, would be known as Class I airports. Class II airports would be those airports that serve scheduled operations of small air carrier aircraft (10-30 seats) and unscheduled operations of larger air carrier aircraft (more than 30 seats). Class III airports would be those airports that serve only scheduled operations of air carrier aircraft with 10-30 seats. Class IV airports would be those airports serving only unscheduled air carrier operations in aircraft with more than 30 seats. These designations are shown in **Table 3E**. The current air carrier aircraft operating at the airport would require that Kingman Airport comply with Class III of the regulation. Should the air carrier aircraft change to include aircraft with more than 30 passenger seats, the airport would be required to comply with Class I of the regulation.

TABLE 3E
Proposed Part 139 Airport Classifications

	Proposed Airport Class			
Type of air carrier operation	**Class I**	**Class II**	**Class III**	**Class IV**
Scheduled Large Air Carrier Aircraft	X			
Unscheduled Large Air Carrier Aircraft	X	X		X
Scheduled Small Air Carrier Aircraft	X	X	X	

The rulemaking establishes the following dates for compliance:

- June 9, 2005: Class II, III and IV airports must submit Airport Certification Manuals to FAA for approval.
- June 9, 2005: At least one training supervisor with each fueling agent must be trained in fire safety prior to this date.
- June 9, 2006: Class II, III and IV airports must submit an Airport Emergency Plan to FAA.
- June 9, 2007: Class II, III and IV airports must comply with the requirements of 14 CFR 139.319-ARFF Operations.

Because Kingman Airport currently maintains a limited operating certificate under 14 CFR Part 139, it must be capable of providing standby equipment and personnel for aircraft rescue and firefighting to air carrier aircraft for any air carrier operations. Kingman Airport's existing rescue and firefighting capabilities satisfy the requirements of Index A (although the ARFF vehicle has been grandfathered under existing rulemaking until it can be replaced). Future airport plans should maintain Index A requirements and include replacing the existing ARFF vehicle. A new ARFF building should also be planned to allow for expanded equipment storage and personnel quarters as needed.

AIRPORT ACCESS

Primary access to the airport is provided from Historic Route 66 (Andy Devine Avenue) via Mohave Airport Drive. The intersection of Mohave Airport Drive and Andy Devine Boulevard is signalized. Directional signage is available from Interstate 40. Besides routine maintenance and pavement improvements, the existing roadway access to the airport should be capable of supporting aviation-related growth at the airport. Expansion of roadways and new roadway development at the airport will be a function of future development at the airport.

SUMMARY

The intent of this chapter has been to outline the facilities required to meet potential aviation demands projected for the airport through the planning horizon. The next step is to develop a direction for implementation that will best meet these projected needs. The remainder of the master plan will be devoted to outlining this direction, its schedule, and costs.