KINGMAN AIRPORT

Chapter Two

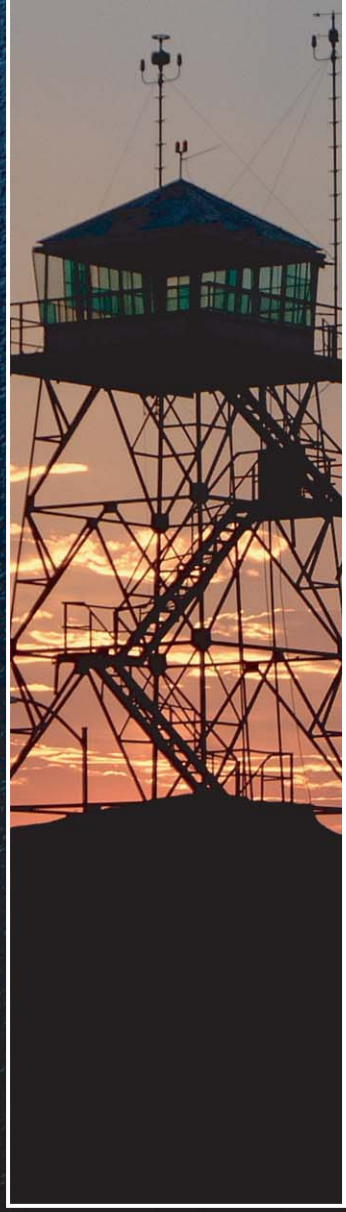
FORECASTS

FORECASTS

Facility planning must begin with a definition of the demand that may reasonably be expected to occur at the facility over a specific period of time. For Kingman Airport, this involves forecasts of aviation activity through the year 2023. In this Master Plan, forecasts of annual enplaned passengers (aircraft boardings), the commercial airline fleet mix, based aircraft, the based aircraft fleet mix, and annual aircraft operations will serve as the basis for facility planning.

Air transportation is a unique industry that has experienced wide fluctuations in growth and recession. For this reason, it is important that from time-to-time an airport re-evaluate its current position and examine future demand trends and potential.

The primary objective of this planning effort is to define the magnitude of change in aviation demand that can be expected over time. Because of the cyclical nature of the economy, it is virtually impossible to predict, with certainty, year-to-year fluctuations in activity when looking 20 years into the future. However, a trend can be established which delineates long-term growth potential. While a single line is often used to express the anticipated growth, it is important to remember that actual growth may fluctuate above and below this line. The point to remember about forecasts is that they serve only as guidelines, and planning must remain flexible to respond to unforeseen facility needs. This is because aviation activity is affected by many external influences, as



well as by the types of aircraft used and the nature of available facilities.

Recognizing this, the Master Plan for Kingman Airport will be demand-based rather than time-based. Demand-based planning relates capital improvements to demand factors, such as based aircraft, instead of points in time. This allows the airport to address capital improvement needs according to the actual demand occurring at the airport. For example, should based aircraft growth slow or dramatically decline, it may not be necessary to implement some improvement projects. However, should the airport experience accelerated growth in based aircraft, the plan will need to be flexible enough to respond accordingly. This dynamic aspect of forecasting aeronautical needs will be further described in subsequent chapters of this Master Plan.

In order to fully assess current and future aviation demand for Kingman Airport, an examination of several key factors is needed. These include: national and regional aviation trends, historical and forecast socioeconomic and demographic information of the area, and historical trends at Kingman Airport.

This is the first planning forecast to be prepared for Kingman Airport subsequent to the events of September 11, 2001. Immediately following the terrorist attacks, the national airspace system was closed and all civilian flights were grounded. Following the resumption of flights, commercial airline traffic declined, which led to schedule reductions and layoffs by many of the commercial airlines to reduce operating losses.

The federal government provided billions of dollars in financial assistance to the commercial airlines, along with loan guarantees. Similar assistance was not provided for the general aviation industry until early 2004. The cumulative impacts of 9/11 may only be determined over time. Prior to updating the airport's forecasts, the following section discusses the trends in aviation at the national level.

NATIONAL AVIATION TRENDS

Each year, the FAA updates and publishes a national aviation forecast. Included in this publication are forecasts for the large air carriers, regional/commuter air carriers, general aviation, and FAA workload measures. The forecasts are prepared to meet budget and planning needs of the constituent units of the FAA and to provide information that can be used by state and local authorities, the aviation industry, and the general public. The current edition when this chapter was prepared was *FAA Aerospace Forecasts-Fiscal Years 2004-2015*, published in March 2004. The forecasts use the economic performance of the United States as an indicator of future aviation industry growth. Similar economic analyses are applied to the outlook for aviation growth in international markets.

In the seven years prior to the events of 9/11, the U.S. civil aviation industry

experienced unprecedented growth in demand and profits. The impacts to the economy and aviation industry from the events of 9/11 were immediate and significant. However, the economic climate and aviation industry have been recovering in the past year. The FAA expects the U.S. economy to recover rapidly over the next two years, growing moderately thereafter. This will positively influence the aviation industry, leading to passenger, air cargo, and general aviation growth throughout the forecast period (assuming that there will not be any new successful terrorists incidents against either U.S. or world aviation). Airline passengers are expected to recover to pre-9/11 levels by 2005, and then grow at 4.2 percent annually through 2015. Large air carriers will grow at 3.8 percent annually, while the regional/commuter airlines are expected to grow at an astonishing pace of 6.4 percent annually. Air cargo revenue-ton-miles (RTMs) are projected to grow at 3.5 percent annually. The number of active general aviation aircraft is expected to grow at 1.3 percent annually.

REGIONAL/COMMUTER AIRLINES

The regional/commuter airline industry consists of 75 airlines providing regularly scheduled passenger service and fleets composed primarily of aircraft having 70 seats or less. This industry segment continues to be the strongest growth sector of the commercial air carrier industry. Dramatic growth in code-sharing agreements with the major carriers, followed by a wave of air carrier acquisitions and purchases of equity interests, has resulted in the transfer of large numbers of short-haul jet routes to their regional partners, fueling the industry's growth. This has allowed the major air carriers to maintain a presence in many markets where they have had to drop service in their efforts to regain profitability and reduce capacity.

There are several important trends for the regional/commuters, brought about by the changes in the major airline industry and introduction of the regional jet. These include: increased capacity, increased passenger trip length, growing load factors, and increased passengers. These will be discussed below.

Regional/commuter passengers continued to grow in 2003, to 108.7 million passengers. This is up from 90.7 million passengers in 2002, an increase of 18.9 percent. Since 2000, regional/commuter enplanements are up 31.3 percent. Despite the events of 9/11, many regionals/commuters were able to maintain their previous flight schedules. In fact, many have even increased their flight schedules in response to the transfer of additional routes from their larger code-sharing partners. Driven by the rapid introduction of new regional jets, regional airline capacity (expressed in available seat miles [ASMs]) was up an additional 24.4 percent in 2003, following a 17.7 percent increase in 2002. The average flight stage and passenger trip length increased 26.0 and 34.4 miles, respectively, in 2003. This reflects the fact that the routes being transferred from the larger network

partners are the medium-haul, non-traditional, regional markets which can be more efficiently flown with the regional jet. This fact becomes clearer when it is noted that the number of regional/commuter departures increased by just 3.6 percent in 2003. The regional/commuters also achieved an all-time-high load factor of 64.7 percent in 2003, an increase of 3.4 percent over the previous year.

Industry growth is expected to continue to outpace that of the larger commercial air carriers. The introduction of new state-of-the-art aircraft, especially high-speed turboprops and regional jets with ranges of well over 1,000 miles, is expected to open up new opportunities for growth in non-traditional markets. The regional airline industry will also continue to benefit from integration with the larger air carriers. The further need for larger commercial air carriers to reduce costs and fleet size will insure that these carriers will continue to transfer smaller, marginally profitable routes to the regional air carriers. Since 2000, over 751 regional jets have been put in service. Without the introduction of these aircraft, the industry changes since 9/11 would not have been possible.

Likewise, the increased use of regional jets will continue the trend of the regionals/commuters serving many of the lower density routes of their major network partner. Regional jet aircraft can serve these markets with the speed and comfort of a larger jet, while at the same time providing greater service frequency that is not economically feasible with larger jets. This is expected to contribute to strong growth during the early portion of the planning period, although this phenomenon is expected to diminish during the mid-to-latter portion of the planning period.

The FAA forecasts the regional/commuter capacity to increase by 26.4 percent in 2004, and 16.4 percent in 2005. These large increases result from the projected delivery of nearly 550 regional jets in this two-year period. With 1,192 regional jets in service in 2003, the FAA projects that number will nearly triple to 3,093 by 2015. Capacity growth will slow to 5.7 percent annually after 2005. The average seating capacity is expected to increase from 44.7 seats in 2003, to 53.6 seats in 2015.

Enplanements are expected to grow 18.4 percent in 2004 and 11.6 percent in 2005. Between 2003 and 2015, enplanements will grow by 6.3 percent annually, from 108.7 million in 2003, to 226.2 million in 2015. In 2015, regional/commuters will carry 21.4 percent of all passengers, up from 16.9 percent in 2003. Regional/commuter operations are expected to increase at 5.5 percent through 2005. Thereafter, operations are forecast to grow at 2.3 percent annually. **Exhibit 2A** presents national regional/commuter airline enplanement projections.

The average trip length is projected to grow from 370.2 miles, to 470.2 miles by 2015. Most of this growth is projected to occur between 2004 and 2006 when trip length will increase by a combined 50 miles, or 16.6 miles per year. The large increase between

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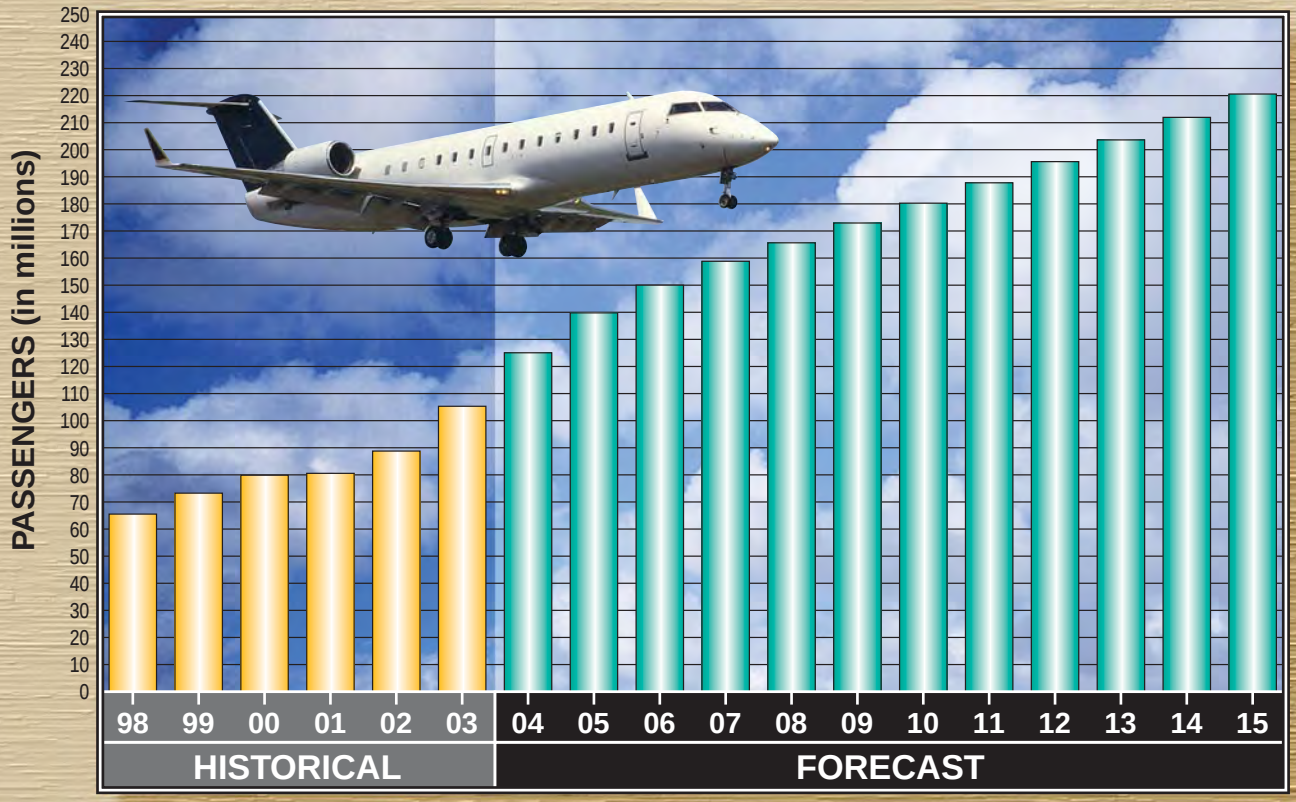
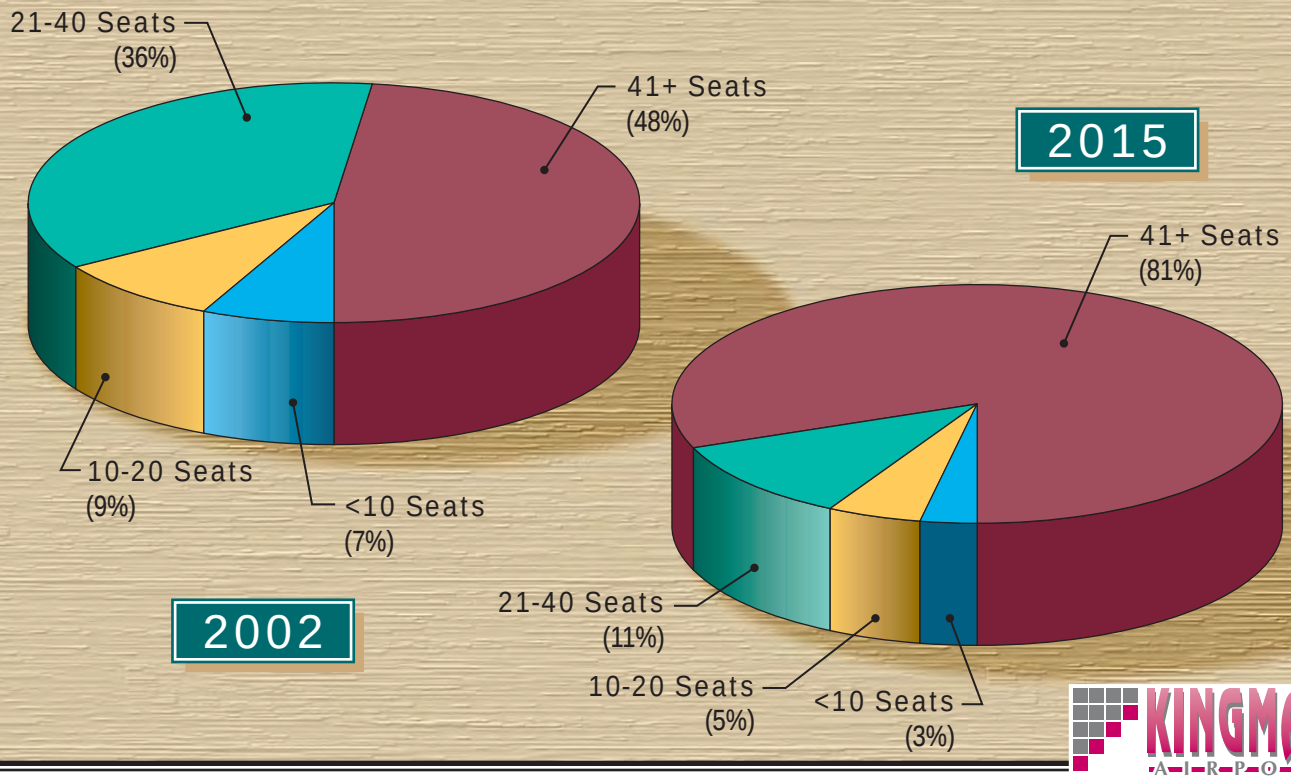
U.S. REGIONAL/COMMUTER SCHEDULED PASSENGER ENPLANEMENTS



Source: FAA Aerospace Forecasts, FY 2004-2015

PERCENT BY AIRCRAFT SEAT SIZE



KINGMAN AIRPORT

Exhibit 2A
U.S. REGIONAL/COMMUTER FORECASTS

2004 and 2006 is the result of the continued integration of regional jets and transfer of longer stage-length flights from the network partner. After 2005, passenger trip length will increase by 5.7 miles per year.

GENERAL AVIATION

Following more than a decade of decline, the general aviation industry was revitalized with the passage of the *General Aviation Revitalization Act* in 1994, which limited the liability on general aviation aircraft to 18 years from the date of manufacture. This legislation sparked an interest to renew the manufacturing of general aviation aircraft, due to the reduction in product liability, as well as renewed optimism for the industry. The high cost of product liability insurance was a major factor in the decision by many U.S.-based aircraft manufacturers to slow or discontinue the production of general aviation aircraft. The industry responded as expected.

According to the General Aviation Manufacturers Association (GAMA), between 1994 and 2000, general aviation aircraft shipments increased at an average annual rate of more than 20 percent, increasing from 928 shipments in 1994, to 3,140 shipments in 2000. However, the growth in the general aviation industry has slowed considerably since 2000, negatively impacted by the national economic recession and the events surrounding 9/11. In 2001, aircraft shipments were down 4.7 percent to 2,994. The 2002 shipments were down an additional 10.2 percent to 2,687. 2003 aircraft shipments were down less than 1.0 percent from 2002, declining only to 2,686. However, 2003 billings were down 15.5 percent, declining for the third straight year.

Most notable about 2003 shipments was that single-engine piston deliveries were the only category to increase. Single-engine piston deliveries increased to 1,825 from 1,601 or 14.0 percent. This is most likely the result of new product offerings and the age of the single-engine piston aircraft fleet. Turboprop and turbojet deliveries declined. Business jets were down 23.4 percent, the second year of decline. This is the result of slowing demand by fractional jet companies and a large used market for turboprop and turbojet aircraft. **Table 2A** summarizes aircraft shipments and billings since 2000.

TABLE 2A
Annual General Aviation Airplane Shipments
Manufactured Worldwide and Factory Net Billings

Year	Total	SEP	MEP	TP	J	Net Billings ($millions)
2000	3,140	18,962	103	415	760	13,497.0
2001	2,994	1,644	147	421	782	13,866.6
2002	2,687	1,601	130	280	676	11,823.1
2003	2,686	1,825	71	272	518	9,994.8

Source: GAMA
SEP – Single-Engine Piston; MEP – Multi-Engine Piston; TP – Turboprop;
J – Turbofan/Turbojet

The decline in aircraft shipments is not expected to last long. According to the National Business Aviation Association (NBAA), there are more than 2,700 aircraft still on order. NBAA cites a study by Honeywell that aircraft shipments will recover to record levels by 2004, and that 8,400 business aircraft will be delivered over the next 10 years.

On February 5, 2002, the FAA published a notice of proposed rulemaking (NPRM), titled *Certification of Aircraft and Airmen for the Operation of Light-Sport Aircraft*. The rulemaking would establish new light-sport aircraft categories and allow aircraft manufacturers to build and sell completed aircraft without obtaining type and production certificates. Instead, aircraft manufacturers would build to industry consensus standards. This reduces development costs and subsequent aircraft acquisition costs. This new category places specific conditions on the design of the aircraft to limit them to low performance aircraft. New pilot training times are reduced and offer more flexibility in the type of aircraft which the pilot would be allowed to operate. Viewed by many within the general aviation industry as a revolutionary change in the regulation of recreational aircraft, this new rulemaking is anticipated to significantly increase access to general aviation by reducing the time required to earn a pilot's license and the cost of owning and operating an aircraft. These regulations are aimed primarily at the recreational aircraft owner/operator. This new rulemaking is expected to add between 300 and 500 new aircraft each year to the national fleet, beginning in 2006. By 2015, there is expected to be 20,915 of these aircraft in the national fleet (including approximately 15,300 existing aircraft which will now be included in the active fleet beginning in 2004).

At the end of 2003, the total pilot population, including student, private, commercial, and airline transport, was estimated by the FAA to decline to 625,011 from the 625,358 pilots in 2002. However, the total pilot population is expected to grow 1.6 percent annually over the next 12 years. A large portion of this growth is from the expected certification of approximately 16,100 currently unrated pilots, between 2004 and 2005, as sport-rated pilots. Excluding this influx of pilots due to new regulations (many of these are existing ultralight pilots which now are not certificated), the annual growth rate for pilots is 1.4 percent. Student pilots increased 1.5 percent in 2003. The number of student pilots is projected to increase by 1.9 percent annually through 2015.

While impacting aircraft production and delivery, the events of 9/11 and the economic downturn have not had the same negative impact on the business/corporate side of general aviation. The increased security measures placed on commercial flights have increased interest in fractional and corporate aircraft ownership, as well as on-demand charter flights. According to GAMA, the total number of corporate operators increased by 471 operators in 2003. Corporate operators are defined as those companies that have

their own flight departments and utilize general aviation airplanes to enhance productivity. **Table 2B** summarizes the number of U.S. companies operating fixed-wing turbine aircraft since 1991.

TABLE 2B
U.S. Companies Operating Fixed-Wing Turbine Business Aircraft and Number of Aircraft, 1991-2003

Year	Number of Operators	Number of Aircraft
1991	6,584	9,504
1992	6,492	9,504
1993	6,747	9,594
1994	6,869	10,044
1995	7,126	10,321
1996	7,406	11,285
1997	7,805	11,774
1998	8,236	12,425
1999	8,778	13,148
2000	9,317	14,079
2001	9,709	14,837
2002	10,191	15,569
2003	10,661	15,870

Source: GAMA/NBAA

The growth in corporate operators comes at a time when fractional aircraft programs are experiencing significant growth. Fractional ownership programs sell 1/8 or greater shares in an aircraft at a fixed cost. This cost, plus monthly maintenance fees, allows the shareholder a set number of hours of use per year and provides for the management and pilot services associated with the aircraft's operation. These programs guarantee the aircraft is available at any time, with short notice. Fractional ownership programs offer the shareholder a more efficient use of time (when compared with commercial air service) by providing faster point-to-point travel times and the ability to conduct business confidentially while flying. The lower initial startup costs (when compared with acquiring and establishing a flight department) and easier exiting options are also positive benefits.

Since beginning in 1986, fractional jet programs have flourished. **Table 2C** summarizes the growth in fractional shares since 1986. The number of aircraft in fractional jet programs has grown rapidly. In 2001, there were 696 aircraft in fractional jet programs. This grew to 776 aircraft in fractional jet programs at the end of 2002, and 823 in 2003.

TABLE 2C
Fractional Shares
1986-2003

Year	Number of Shares
1986	3
1987	5
1988	26
1989	51
1990	57
1991	71
1992	84
1993	110
1994	158
1995	285
1996	548
1997	957
1998	1,551
1999	2,607
2000	3,834
2001	4,071
2002	4,232
2003	4,515

Source: GAMA/NBAA

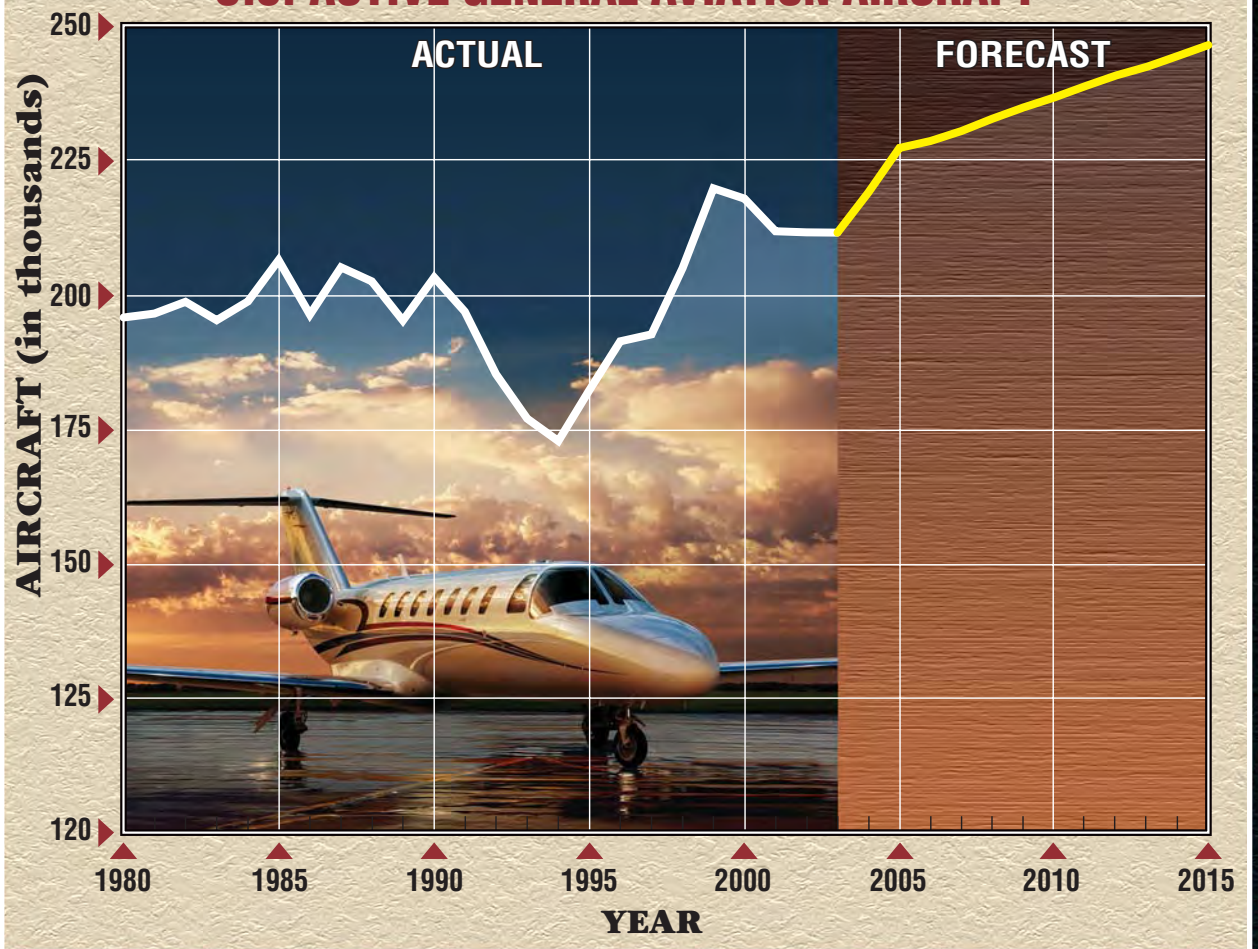
Manufacturer and industry programs and initiatives continue to revitalize the general aviation industry with a variety of programs. For example, Piper Aircraft Company has the Piper Financial Services (PFS) to offer competitive interest rates and/or leasing of Piper aircraft. Manufacturer and industry programs include the "No Plane, No Gain" program promoted jointly by the GAMA and the NBAA. This program was designed to promote the use of general aviation aircraft as an essential, cost-effective tool for businesses. Other programs are intended to promote growth in new pilot starts and to introduce people to general aviation. These include "Project Pilot" sponsored by the Aircraft Owners and Pilots Association (AOPA), "Flying Start" sponsored by the Experimental Aircraft Association (EAA), "Be a Pilot" jointly sponsored and supported by more than 100 industry organizations, and "Av Kids" sponsored by the NBAA. Over the years, programs such as these have played an important role in the success of general aviation and will continue to be vital to its growth in the future.

In 2002, there were an estimated 211,244 active general aviation aircraft, representing a decrease of 203 active aircraft from the previous year and the third straight decline following five years of increases. **Exhibit 2B** depicts the FAA's forecast for active general aviation aircraft in the United States. The FAA predicts the number of active general aviation aircraft to increase at an average annual rate of 1.3 percent over the 12-year forecast period. Piston-powered aircraft are expected to grow at an average annual rate of 0.2 percent. This is due, in part, to declining numbers of multi-engine piston aircraft, while single-engine and rotorcraft increase at rates of 0.3 and 1.0 percent, respectively.

Turbine-powered, fixed-wing aircraft (turboprop and turbojet) are expected to grow at an average annual rate of 3.6 percent over the forecast period. The jet portion of this fleet is expected to grow at an average annual growth rate of 5.1 percent. This growth rate for jet aircraft can be attributed to growth in the fractional-ownership industry, new product offerings (which include new entry-level aircraft and long-range global jets), and a shift away from commercial travel by many travelers and corporations.

Industry estimates for the new microjets suggest that the market could be as high as 5,000 new aircraft by 2010. The microjets are very light jets (less than 12,500 pounds) with low acquisition costs (around $1.0 million) and are believed to have the potential to redefine business jet flying. Their low operating costs (between $0.50 and $1.00 per mile) have the capability to support a true air taxi business service. Current microjet projects include the Eclipse, Cessna Mustang, Raytheon Premier, and Adams A700. The current FAA forecast assumes the entry of a microjet in 2006, reaching 4,600 new aircraft by 2015.

U.S. ACTIVE GENERAL AVIATION AIRCRAFT



U.S. ACTIVE GENERAL AVIATION AIRCRAFT (in thousands)

Year	FIXED WING									
	PISTON		TURBINE		ROTORCRAFT					
	Single Engine	Multi-Engine	Turboprop	Turbojet	Piston	Turbine	Experimental	Sport Aircraft	Other	Total
2003 (Est.)	143.4	17.5	6.9	8.5	2.4	4.3	22.0	N/A	6.4	211.2
2005	143.5	17.3	7.0	9.0	2.4	4.3	22.1	15.5	6.4	227.6
2010	146.2	16.9	7.6	12.0	2.6	4.4	22.7	18.1	6.5	236.9
2015	148.5	16.5	8.1	15.5	2.7	4.5	23.1	20.9	6.6	246.4

Source: FAA Aerospace Forecasts, Fiscal Years 2004-2015.

Notes: An active aircraft is one that has a current registration and was flown at least one hour during the calendar year.

KINGMAN AIRPORT

Exhibit 2B
U.S. ACTIVE GENERAL AVIATION
AIRCRAFT FORECASTS

POPULATION PROJECTIONS

Population growth provides an indication of the potential for sustaining growth in aviation activity over the planning period. **Table 2D** summarizes historical and forecast population numbers for the City of Kingman, Mohave County, and the State of Arizona.

Population projections were provided by the Arizona Department of Economic Security, Population Statistics Unit. Projections for the City of Kingman indicate an increase of more than 8,000 new residents by 2023, which equals an average annual growth rate of 1.6 percent. During this same time, the state and the county are expected to experience average annual growth rates of 1.9 percent and 1.7 percent respectively. The population forecasts are presented in **Table 2D**.

TABLE 2D
Population Forecasts

Year	Kingman	Mohave County	State of Arizona
2002	22,045	166,465	5,472,750
2008	24,300	185,400	5,908,600
2013	26,500	207,500	6,503,000
2018	28,500	228,400	7,113,900
2023	30,500	247,800	7,740,900
Average Annual Growth Rate (2002-2023)	1.6%	1.9%	1.7%

Source: Arizona Department of Economic Security, Population Statistics Unit.

AIRPORT SERVICE AREA

The service area of an airport is defined by its proximity to other airports providing similar services. In determining the aviation demand for an airport, it is necessary to identify the role of that airport, as well as the specific areas of aviation demand the airport is intended to serve. The primary role of Kingman Airport is to serve commercial airline and general aviation demand.

As in any business enterprise, the more attractive the facility is in services and capabilities, the more competitive it will be in the market. If an airport's attractiveness increases in relation to nearby airports, so will the size of the service area. If facilities are adequate and rates and fees are competitive at Kingman Airport, some level of aviation activity might be attracted to the airport from surrounding areas.

The nearest commercial service airports in the vicinity of Kingman Airport are listed below, along with their distance from the airport in miles.

- Laughlin-Bullhead Airport – 43 miles west in Bullhead City, Arizona

- Lake Havasu Airport – 69 miles southwest in Lake Havasu, Arizona
- McCarran International Airport – 110 miles northwest in Las Vegas, Nevada
- Ernest A. Love Field Airport – 137 miles southeast in Prescott, Arizona
- Flagstaff Pulliam Airport – 147 miles east in Flagstaff, Arizona
- Phoenix-Sky Harbor International Airport – 187 miles southeast in Phoenix, Arizona

McCarran International Airport offers the greatest competition to Kingman Airport commercial airline service. Located approximately 110 miles (by road) west, McCarran International Airport is served by all major airlines and many regional air carriers. Phoenix-Sky Harbor International Airport is a choice for many air travelers, since it is also served by the major airlines. Lake Havasu Airport and Ernest A. Love Field Airport are not viable choices, as they provide regional service to Phoenix very similar to that provided from Kingman Airport. While Flagstaff Pulliam Airport provides more frequency of service, the service at Flagstaff is not comparable to that of McCarran International Airport or Phoenix-Sky Harbor International Airport.

With scheduled air service available in the other communities in Mohave County, the service area for Kingman Airport is limited. Scheduled service is available in both Lake Havasu and Bullhead City. Since Laughlin-Bullhead Airport currently only provides four scheduled weekly departures to Minneapolis, Minnesota, Kingman Airport may be an alternative to air travelers needing daily departure schedules from Bullhead City. McCarran International Airport and Phoenix-Sky Harbor International Airport also draw air travelers from the southern and western-portions of Mohave County. Considering these factors, the primary catchment area for enplanements at Kingman Airport is limited to the City of Kingman and other communities in central and west-central Mohave County.

From a commercial service perspective, the decision to fly out of Kingman Airport is affected by numerous factors, including the drive times to McCarran International Airport and Phoenix-Sky Harbor International Airport, the availability of flights, aircraft types and airfares offered at McCarran International Airport and Phoenix-Sky Harbor International Airport, and the type of traveler (business vs. pleasure). Business travelers will generally pay higher airfares for the time savings achieved through flying to the local airport, when compared to a recreational traveler.

The primary attraction for air service at Kingman Airport is the ground distance to McCarran International Airport and Phoenix Sky Harbor International Airport and the time savings that can be achieved through flying to/from Kingman Airport. Due to the limited size of the potential passenger market in Kingman, it is unlikely that Kingman Airport could offer similar availability of flights, aircraft, or airfares for air travelers to/from Kingman, as Phoenix Sky Harbor Interna-

tional Airport or McCarran International Airport. Therefore, there will always be air travelers using the hub airports in Las Vegas and Phoenix rather than flying directly from Kingman.

For general aviation, the service area is more closely defined around the airport, since other general aviation airports in the area provide similar services to smaller aircraft. A description of nearby general aviation airports within a 40 nautical-mile radius of Kingman Airport was presented in Chapter One. Due to the comparable levels of facilities and services, it can be expected that the majority of general aviation demand for Kingman Airport will come from within and just outside of the surrounding community. A review of aircraft registrations confirmed that the majority of aircraft owners at Kingman Airport were from the City of Kingman and immediate communities. However, there were some aircraft owners from Bullhead City.

AVIATION ACTIVITY FORECASTS

The following forecast analysis examines each of the aviation-demand categories expected at Kingman Airport over the next 20 years. Each segment will be examined individually, and then collectively, to provide an understanding of the overall aviation activity at the airport through 2023.

The need for airport facilities at Kingman Airport can best be determined by accounting for forecasts of future aviation demand. Therefore, the remainder of this chapter presents the forecasts for airport users, and includes the following:

- COMMERCIAL SERVICE
  - Annual Enplaned Passengers
  - Operations and Fleet Mix
  - Peak Activity
  - Annual Instrument Approaches
- AIR TAXI AND MILITARY
  - Annual Operations
- GENERAL AVIATION
  - Based Aircraft
  - Based Aircraft Fleet Mix
  - Local and Itinerant Operations
  - Peak Activity
  - Annual Instrument Approaches

COMMERCIAL AIRLINE SERVICE

To determine the types and sizes of facilities necessary to properly accommodate present and future airline activity, two elements of commercial service must be forecast: annual enplaned passengers and annual aircraft operations. Of these, the number of annual enplaned passengers is the most basic indicator of demand for commercial service activity. The term "enplanement" refers to a passenger boarding an airline flight. From a forecast of annual enplanements, operations and peak period activity can be projected based on the specific characteristics of passenger demand at the airport.

Kingman Airport Air Service

Kingman Airport has been an essential air service (EAS) route since 1978. The EAS program is administered by the U.S. Department of Transportation to ensure that smaller communities retain access to the national air transportation system. Under the EAS program, the air carrier providing scheduled service to a community is provided a monthly subsidy in return for providing a minimum level of service to a hub airport. Mesa Airlines has held the EAS contract since 1989. Prior to 1989, service was provided by Golden Pacific Airlines, Cochise Airlines, and Republic Airlines. The airport has never been served by more than one airline at a time.

The current EAS program for Kingman Airport includes a service guarantee of two daily flights to Phoenix-Sky Harbor International Airport. Each flight is allowed an intermediate stop. The June 2004 schedule is presented in **Table 2E**. The current schedule includes three daily departures. All flights to and from Kingman stop in Lake Havasu. Mesa Airlines operates the 19-seat Beechcraft 1900, which is a turboprop aircraft.

Kingman Airport is part of the Arizona Rural Consortium of Airports (Consortium). The Consortium is comprised of the communities of Kingman, Prescott, Page, Show Low, and Sierra Vista. In conjunction with the Arizona Department of Transportation (ADOT) Aeronautics Division, the Consortium was granted $1.5 million in 2003, through the Small Community Air Service Development Pilot Program (SCASDPP) to improve air service. The Consortium's plan is to combine the current EAS funding for these communities with the SCASDPP grant and local funds, into one large pool of money. With ADOT acting as the contractor, one single air carrier would be selected to serve all five communities. (Currently, there are three airlines serving these five markets.) The program includes funding for service guarantees, an incentive program to increase enplanement levels at each airport, and the development of a marketing program. As of June 2004, this program was still in development.

TABLE 2E
Mesa Airlines Flight Schedule – June 2004
Kingman Airport

Flight #	Departure	Arrival
Kingman to Phoenix – Monday thru Friday		
6840	6:25 a.m.	8:05 a.m.
6847	11:00 p.m.	12:40 p.m.
6848	3:30 p.m.	5:10 p.m.
Phoenix to Kingman – Monday thru Friday		
6841	8:50 a.m.	10:30 a.m.
6842	1:20 p.m.	3:00 p.m.
6843	7:25 p.m.	9:05 p.m.

Source: America West Airlines

Passenger Enplanements

Historical passenger enplanements and the annual percentage change since 1995 are presented in **Table 2F**. As shown in the table, enplanements at Kingman Airport have fluctuated significantly in the past several years. Enplanements peaked at 3,558 in 1999. The lowest annual level was

1996 with 1,602. The decline in annual enplanements in 1996 and 1997 is the result of schedule changes in those years that included only two daily flights. The decline in 2001 and 2002 is the result of reductions in the schedule as well. In 2003, enplanements were up 15.6 percent from 2002.

TABLE 2F
Historical Passenger Enplanements
Kingman Airport

Year	Total Enplanements	Annual % Change
1995	3,459	-
1996	1,602	-53.7%
1997	1,802	12.5%
1998	2,897	60.8%
1999	3,558	22.8%
2000	3,420	8.3%
2001	3,103	-9.3%
2002	2,001	-35.5%
2003	2,313	15.6%

Source: Airport Records

As in any case where there are differences in levels of service, Kingman Airport must compete with the air service available at McCarran International Airport and Phoenix Sky Harbor International Airport. While 110 miles and 187 miles from Kingman, respectively, each airport provides regular jet service and affordable airfares to all domestic destinations. As a result, many passengers choose to use these airports rather than fly directly to the more convenient Kingman Airport. This is referred to as leakage. The capture of the leakage can lead to growth in enplanements at the airport.

The number of potential enplanements that Kingman Airport may realize depends upon the level of air service at the airport. The full potential for Kingman Airport would only be realized if the airport provided services and air fares similar to McCarran International Airport and/or Phoenix Sky Harbor International Airport. This is not likely, considering the communities that McCarran International Airport and Phoenix Sky Harbor International Airport serve, and the established airline operations at those airports.

The first step in developing forecasts of total annual enplaned passengers involves the use of time-series and regression analyses. Time-series analysis pertains to projecting future activity based on previous trends. Regression analyses measure the statistical relationship between dependent and independent variables, and provide a "correlation coefficient." Due to the fluctuations in enplanement levels since 1992, the time-series and regression analyses yielded correlation coefficients too low to have any predictive reliability. Therefore, none of the time-series or regression analyses were carried forward for the study. Instead, market share comparisons were used to project annual enplanements at Kingman Airport.

The last column on **Table 2G** examines scheduled enplanements at Kingman Airport as a percentage of domestic U.S. regional/commuter airline enplanements since 1995. With growth in U.S. regional/commuter air-

line enplanements outpacing the growth in annual enplanements at Kingman Airport, the Kingman Airport share of U.S. regional/commuter airline enplanements has declined since 1995, reaching a low of 0.002 percent in 2002 and 2003.

The average market share over the past nine years has been 0.004 percent; however, the annual share has been lower than this average four of the last nine years. Since 2001, the market share has been static at 0.002 percent. Having remained steady at 002 percent in 2002 and 2003, the market may have stabilized with the return of three daily flights to Kingman Airport. A projection which maintains this market share through 2023 is shown in **Table 2G**. This forecast projects enplanement growth at an average annual rate of 5.1 percent through 2023, consistent with national FAA projections for regional/commuter airline enplanement growth.

TABLE 2G
Historical and Forecast Share of
U.S. Regional/Commuter Airline Enplanements
Kingman Airport

Year	Kingman Enplanements	U.S. Regional. Enplanements	Kingman % Share
Historical			
1995	3,459	55,800,000	0.006%
1996	1,602	60,100,000	0.003%
1997	1,802	61,900,000	0.003%
1998	2,897	65,700,000	0.004%
1999	3,558	73,100,000	0.005%
2000	3,420	79,700,000	0.004%
2001	3,103	80,400,000	0.004%
2002	2,001	88,600,000	0.002%
2003	2,313	105,100,000	0.002%
Forecasts			
Constant Share			
2008	3,600	165,300,000	0.002%
2013	4,500	203,200,000	0.002%
2018	5,400	244,800,000	0.002%
2023	6,300	285,500,000	0.002%
Avg. Annual	5.1%	5.1%	
Change	3,987	180,400,000	
Increasing Share			
2008	3,600	165,300,000	0.002%
2013	5,900	203,200,000	0.003%
2018	11,900	244,800,000	0.005%
2023	17,700	285,500,000	0.006%
Avg. Annual	10.7%	5.1%	
Change	15,387	180,400,000	

Note: 2018 & 2023 US Regional Enplanements Extrapolated by Coffman Associates
US Regional Airline Enplanements - FAA Aerospace Forecasts

A second market share examines Kingman Airport recapturing a greater share of the leakage in the market and growing at a faster rate than national regional/commuter airline enplanements. As shown in **Table 2G**, increasing the Kingman Airport share of U.S. regional/commuter airline enplanements to the 1995 level of 0.006 percent, yields an average annual growth rate of 10.7 percent and 17,700 enplanements in 2023.

Table 2H examines enplanements as a ratio of the City of Kingman residents. The City of Kingman represents the primary catchment area for Kingman Airport enplanements. Similar to the Kingman Airport share of U.S. regional/commuter airline enplanements, the ratio of enplanements to residents has declined since 1995, as the City of Kingman population has grown at a faster rate than Kingman Airport enplanements. A forecast assuming the 2003 ratio remains constant through 2023 is presented in **Table 2H**. This projection forecasts annual enplanements growing at 1.5 percent annually through 2023, reaching 3,100. A forecast increasing the ratio of enplanements to residents to the 1995 ratio of 20.6, results in annual enplanements reaching 6,400 by 2023, an average annual growth rate of 5.2 percent.

Enplanement levels and the ratio-to-residents in similarly-sized communities have also been examined to estimate market potential for Kingman Airport. **Table 2J** summarizes communities with population levels near the existing City of Kingman population or within the 20-year forecast population of the City of Kingman. As shown in the table, each of these communities has experienced higher enplanements levels than Kingman Airport, even though the population in these communities is comparable to the City of Kingman.

The higher enplanement levels results in a higher ratio of enplanements to 100 residents than for Kingman Airport. For example, for Fort Dodge, Iowa, the 2000 ratio of enplanements to 100 residents was 46.7. For Kearny, Nebraska, this ratio was 38.1. In Carlsbad, New Mexico, this ratio was 28.7. Prescott, Arizona, had an 18.6 ratio, while North Platte, Nebraska, and Liberal, Kansas, experienced 37.7 and 28.1 ratios, respectively. In 2000, Kingman Airport had a ratio of 16 enplanements per 100 residents.

As shown in **Table 2K**, these ratios have declined since 2002, as enplanement levels at these airports have declined. Similar to Kingman Airport, the declines at these airports were the result of the lower enplanement levels nationwide, brought about by the events of 9/11 and economic recession.

TABLE 2H
Historical and Forecast Enplanements Per Capita
Kingman Airport

Year	Kingman Enplanements	City of Kingman Population	Enplanements Per Residents
Historical			
1995	3,459	16,775	20.6
1996	1,602	17,385	9.2
1997	1,802	18,425	9.8
1998	2,897	19,225	15.1
1999	3,558	20,000	17.8
2000	3,420	20,069	17.0
2001	3,103	21,240	14.6
2002	2,001	22,045	9.1
2003	2,313	22,690	10.2
Forecasts			
Constant Share			
2008	2,500	24,300	10.2
2013	2,700	26,500	10.2
2018	2,900	28,500	10.2
2023	3,100	30,500	10.2
Avg. Annual	1.5%	1.5%	
Change	787	7,810	
Increasing Share			
2008	2,900	24,300	12.00
2013	4,000	26,500	15.00
2018	5,100	28,500	18.00
2023	6,400	30,500	21.00
Avg. Annual	5.2%	1.5%	
Change	4,087	7,810	

Note: 2009, 2025 Population Extrapolated by Coffman Associates
City of Kingman Population –Arizona Department of Economic Security

TABLE 2J
Comparable Markets
Kingman Airport

	2002 Population	2002 Enplane-ments	Ratio To 100 Residents	2000 Population	2000 Enplane-ments	Ratio to Residents
Prescott, AZ	36,300	9,444	26.0	34,007	6,337	18.6
Kearney, NE	27,910	5,184	18.6	27,433	10,463	**38.1**
Carlsbad, NM	25,196	2,616	10.4	25,642	7,355	**28.7**
Fort Dodge, IA	24,897	7,662	30.8	25,136	11,729	**46.7**
North Platte, NE	23,674	5,989	25.3	23,889	9,017	37.7
Liberal, KS	20,082	2,965	14.8	19,666	5,522	28.1
Kingman, AZ	22,092	2,590	11.7	20,905	3,420	16

Source for Historical Population Data: http://eire.census.gov/popest/data/cities/subtab05.php
Source for Historical Enplanements: FAA

Considering the impact that the unusual events of 9/11 and the economic recession have made on the enplanement levels at airports nationwide, market comparison forecasts for Kingman Airport were developed using ratios from these communities for 2000. **Table 2K** summarizes three alternative forecasts which apply the 2000 ratio of enplanements from three communities to the City of Kingman forecast population, to derive an understanding of the market potential at Kingman Airport if it were to experience similar ratios of enplanements to residents. Ratio 1 considers the 2000 Fort Dodge, Iowa ratio of 46.7 enplanements per 100 residents. Ratio 2 considers the 2000 Kearny, Nebraska ratio of 38.1 enplanements per 100 residents, while ratio 3 considers the 2000 Carlsbad, New Mexico ratio of 28.7 enplanements per 100 residents.

Forecasts included in the *2000 Arizona State Aviation Needs Study* (SANS) and the FAA *Terminal Area Forecasts* (TAF) have also been examined for comparative purposes. The 2000 SANS projected enplanements growing from 3,558 in 1999, to 8,426 annual enplanements by the year 2020. This represents a 4.1 percent annual growth rate. The FAA TAF projects enplanements at Kingman Airport to remain constant at 2,066 through the end of the planning period. No explanation is given by the FAA for the TAF enplanement projections. Given that the FAA forecast is lower than the actual 2002 and 2003 enplanement levels, the TAF clearly under-predicts the potential future enplanements for Kingman Airport.

TABLE 2K
Market Comparison Forecasts
Kingman Airport

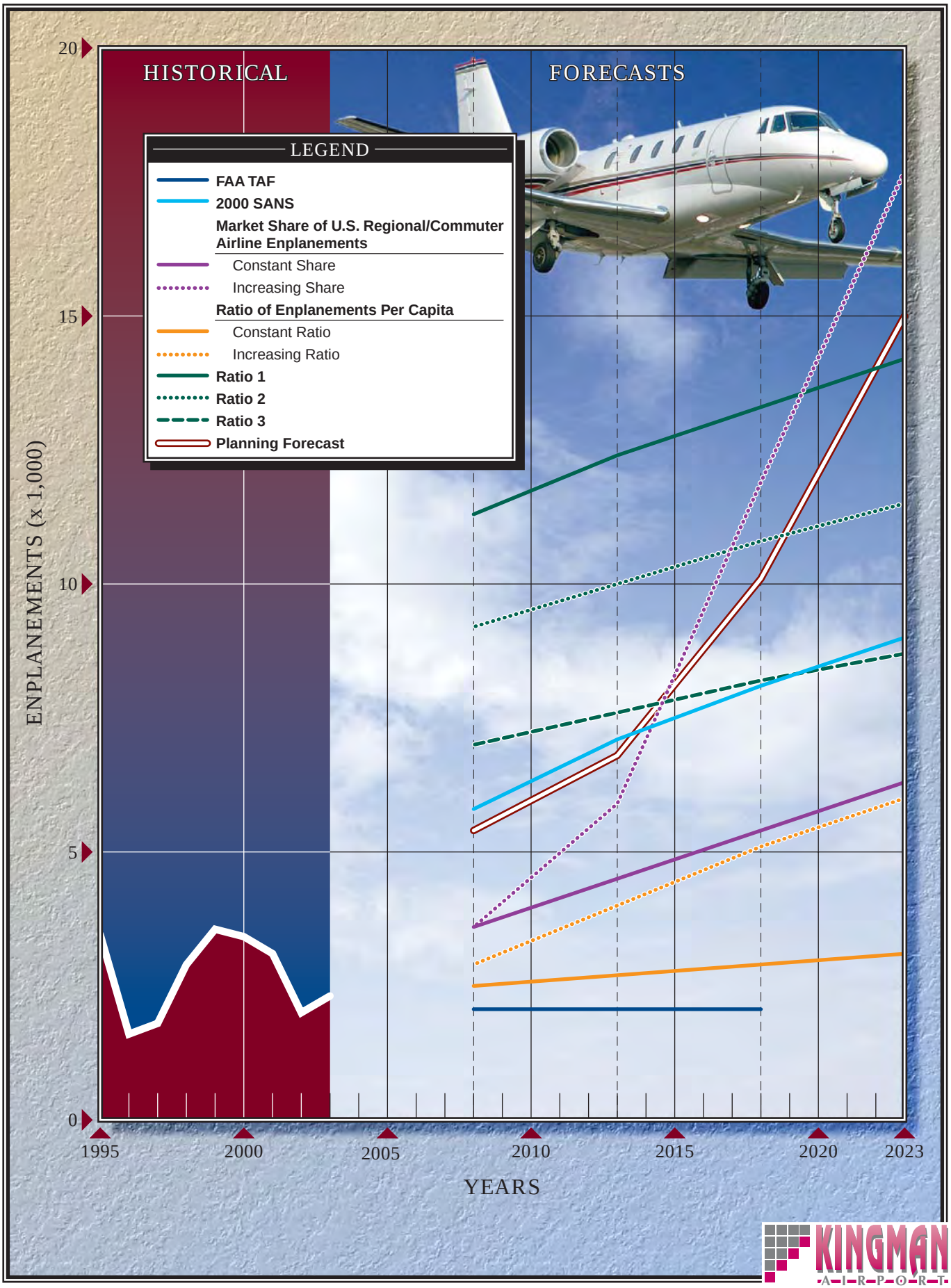
Year	City of Kingman Population	Ratio 1	Kingman Airport Enplanements	Ratio 2	Kingman Airport Enplanements	Ratio 3	Kingman Airport Enplanements
2008	24,300	46.7	11,300	38.1	9,200	28.7	7,000
2013	26,500	46.7	12,400	38.1	10,000	28.7	7,600
2018	28,500	46.7	13,300	38.1	10,800	28.7	8,200
2023	30,500	46.7	14,200	38.1	11,500	28.7	8,700

Notes: Ratio 1 - Fort Dodge, IA, 2000, Ratio 2 - Kearney, NE, 2000, Ratio 3 - Carlsbad, NM, 2000

Exhibit 2C graphically compares nine annual enplanement projections for Kingman Airport. **Table 2L** summarizes the key milestone levels of each projection. The combination of the forecasts represents a "forecast envelope," or the area in which future enplanements should be found.

TABLE 2L
Summary of Passenger Enplanement Forecasts
Kingman Airport

	2003	2008	2013	2018	2023
Market Share U.S. Domestic Enplanements					
Constant Market Share		3,600	4,500	5,400	6,300
Increasing Market Share		3,600	5,900	11,900	17,700
Enplanements Per Capita (City of Kingman)					
Constant Ratio Projection		2,500	2,700	2,900	3,100
Increasing Ratio Projection		2,900	4,000	5,100	6,000
Market Comparisons					
Ratio 1		11,300	12,400	13,300	14,200
Ratio 2		9,200	10,000	10,800	11,500
Ratio 3		7,000	7,600	8,200	8,700
2000 Arizona State Aviation Needs Study (SANS)		5,800	7,100	8,100	9,000
FAA Terminal Area Forecast (TAF)		2,066	2,066	2,066	N/A
Selected Planning Forecast	**2,313**	**5,400**	**6,800**	**10,100**	**15,000**



KINGMAN AIRPORT

Exhibit 2C
ENPLANEMENT PROJECTIONS

The constant ratio of enplanements per resident forecast represents the low end of the forecast envelope, while the increasing share of U.S. regional/commuter airline enplanement forecast forms the upper end of the forecast envelope. The FAA TAF forecast lies below the forecast envelope.

In examining the forecasts, it would appear that the increasing share of U.S. regional airline enplanements is too aggressive for the airport. This forecast yields a strong annual growth rate that more than likely could not be sustained over the planning period. The constant ratio of enplanements per resident and increasing ratio of enplanements per resident appears to understate growth potential. While the forecasts derived from comparing ratios of enplanements to residents in three comparable communities provide achievable long term growth potential, the short term (2008) levels are aggressive. Therefore, the selected planning forecast must consider the potential growth of the forecasts combined.

There is potential for growth in the Kingman market. The local population and economy is growing, as evidenced previously. The distance between Kingman and Las Vegas and Phoenix areas can attract air travelers who wish to shorten their travel times to and from the area. This is important to business travelers and some visitors. Historically, enplanements have grown during periods of reliable consistent service. Between 1997 and 1999, enplanements nearly doubled when a third flight was added each day. The Kingman Airport market benefits from the assurance of continual service through the EAS program. Service enhancements could also be experienced when the SCASDPP grant program is implemented. The SCASDPP grant program will include incentives to the carrier for reaching certain enplanement milestones in each market. Kingman Airport is served exclusively by regional airlines. This is the fastest-growing segment of the airline industry. Finally, historical enplanement levels in similarly-sized communities have been higher than experienced at Kingman Airport. This indicates that the population of this community can support higher levels of air service and annual enplanement levels.

The selected planning forecast for Kingman Airport allows for growth in the market without overstating the potential. This forecast closely tracks the 2000 SANS through approximately 2015. After this, the selected planning forecast projects the Kingman Airport maturing to levels comparable to similar communities such as Prescott, Arizona, and Fort Dodge, Iowa. The selected forecast equates to a 9.8 percent annual growth rate through 2023.

Fleet Mix and Operations Forecast

The type of aircraft in the commercial airline fleet serving the airport is an important component of airport planning. Not only will the make-up of the commercial airline fleet mix serving

the airport be helpful in determining the number of commercial airline operations at the airport, but it is also helpful in defining many of the key parameters used in airport planning - namely, the critical aircraft serving the airport (used for pavement design, ramp geometry, and terminal complex layout). It is expected that air service in the future at Kingman Airport will continue to be provided by regional/ commuter airlines.

As previously mentioned, Air Midwest (a Mesa Airlines subsidiary) provides scheduled air service at Kingman Airport. Service is presently comprised entirely of the 19-seat Beech 1900 aircraft. The Mesa Airlines fleet includes larger DeHavilland Dash-8 aircraft and regional jets. Other regional air carriers in the southwest United States have fleets with 30-seat turboprop aircraft and regional jets as well.

The newest regional aircraft in the national fleet includes faster turboprop aircraft such as the 37-seat DeHavilland Q-100 and smaller regional jets such as the 30-seat Embraer Regional Jet (ERJ-120). With room for additional passengers, these aircraft offer operators a significant reduction in seat-mile operating costs, while offering many of amenities that the flying public has become accustomed to such as a flight attendant and restrooms on board. As enplanements grow, it can be expected that larger aircraft would be used at the airport to serve peak period times.

The potential number of operations is derived from the boarding load factor (BLF). The BLF is determined by dividing the number of enplanements per departure by the average number of departure seats (aircraft seating capacity). The boarding load factor is important to an airline because it is the basis for measuring the ability to profit in a given market. When a load factor is low, an airline will generally cut back the number of seats available by either reducing the size of the aircraft serving the market or reducing the number of flights. Similarly, when the load factor is high, an airline will begin to consider increasing the number of flights or the size of its aircraft.

In 2003, the average number of departure seats was 19, as the airport was consistently served with the Beech 1900 aircraft. The 2003 BLF at Kingman Airport was 15 percent. This BLF is low since Kingman Airport must share an aircraft with another intermediate destination such as Lake Havasu or Prescott. The airline must reserve seats on the departing aircraft from Kingman Airport to have seats available at the intermediate destination.

Similar to the national trend, the boarding load factor for Kingman Airport is expected to increase slightly over the planning period, as enplanement levels grow. The introduction of larger capacity aircraft is anticipated as the aircraft fleet mix changes for the carriers serving the airport and enplanement levels grow. Since service to Kingman has intermediate stops, it is very likely that larger aircraft may be used, particularly if enplanements grow at the intermediate stop. **Table 2M** summarizes the fleet mix and operations forecast for Kingman Airport.

TABLE 2M
Airline Fleet Mix and Operations Forecast
Kingman Airport

		FORECAST			
Fleet Mix Seating Capacity	**2003**	**2008**	**2013**	**2018**	**2023**
< 20 seats (19 average) (Beech 1900)	100%	100%	100%	80%	70%
> 20 seats (30 average) (EMB 120, Q-100)	0%	0%	0%	20%	30%
Totals	100%	100%	100%	100%	100%
Average Seats Per Departure	19	19	19	21	22
Boarding Load Factor	0.15	0.20	0.25	0.30	0.35
Enplanements Per Departure	3	4	5	6	8
Annual Enplanements	2,313	5,400	6,800	10,100	15,000
Annual Departures	791	1,400	1,450	1,600	1,900
Annual Operations	1,582	2,800	2,900	3,200	3,800

Source: Coffman Associates Analysis.

GENERAL AVIATION

General aviation is defined as that portion of civil aviation which encompasses all portions of aviation, except commercial operations. To determine the types and sizes of facilities that should be planned to accommodate general aviation activity, certain elements of this activity must be forecast. These indicators of general aviation demand include: based aircraft, aircraft fleet mix, annual operations, peak activity, and annual instrument approaches.

Based Aircraft

The number of based aircraft is the most basic indicator of general aviation demand. By first developing a forecast of based aircraft, the growth of aviation activities at the airport can be projected.

As mentioned in the previous chapter, a business located on the airport provides maintenance services to the airline and air cargo industry. As part of their services, this company also provides long term aircraft storage services. Based on available records, the number of aircraft stored at Kingman Airport by this business has exceeded 100 annually since 1996. Historically, these aircraft have been included as part of the total based aircraft count at the airport. For planning purposes, the stored aircraft will be separated from the general aviation based aircraft count, since there are different demand considerations and facility planning factors for the stored aircraft and general aviation based aircraft at the airport. The total based aircraft count and number of stored aircraft and general aviation based aircraft since 1996 is presented in **Table 2N**.

TABLE 2N
Historical Based Aircraft
Kingman Airport

Year	Total Based Aircraft	Stored Aircraft	General Aviation Based Aircraft
1996	162	117	45
1998	184	124	60
2002	252	167	85
2003	264	152	112

General Aviation Based Aircraft

General aviation based aircraft have grown rapidly at Kingman Airport since 1996. As shown in **Table 2N**, general aviation based aircraft have more than doubled from the 45 based aircraft in 1996 to 112 based aircraft in 2003. Some of this growth is related to new hangar construction at the airport in the past few years. Because of the limited historical data, time-series and regression analyses were not performed, as they would not provide useful projections of based aircraft numbers. Instead, market share forecasts were used to forecast general aviation based aircraft at Kingman Airport.

The first method used to project based aircraft examined the Kingman Airport's share of registered aircraft in Mohave County. As shown in **Table 2P**, the airport captured 11 percent of aircraft registered in the county in 1996. The airport's market share has since increased, capturing 24 percent in 2003.

TABLE 2P
General Aviation Based Aircraft
Share of Registered Aircraft (Mohave County)
Kingman Airport

Year	Kingman Airport Based Aircraft	Mohave County Registered Aircraft	Market Share of Registered Aircraft
1996	45	399	11%
1998	60	411	15%
2002	85	433	20%
2003	112	466	24%
Constant Market Share			
2008	125	521	24%
2013	138	573	24%
2018	152	635	24%
2023	168	701	24%
Increasing Market Share			
2008	135	521	26%
2013	160	573	28%
2018	191	635	30%
2023	224	701	32%

Source: Historical Based Aircraft – Airport Records; 1996-2003 Registered Aircraft – Aviation Goldmine CD (1994-2000), Avantex Aircraft & Airmen CD (2001-2003). Forecast registered Aircraft – 2000 SANS

Forecasts for registered aircraft growth in Mohave County were prepared for the 2000 SANS. The 2000 SANS projected Mohave County registered aircraft to grow to 661 by 2020. For purposes of this analysis, the registered aircraft forecast was extrapolated to 2023. Forecasts of based aircraft were developed by projecting the Kingman Airport's share of registered aircraft through 2023. The first forecast assumes the 2003 share will remain constant at 24 percent through the planning. This yields 168 based aircraft by 2023. The second forecast assumes the airport's market share will continue to increase, yielding 224 based aircraft by the year 2023. These market share forecasts are presented in **Table 2P**.

Based aircraft were also examined as a percentage of U.S. active general aviation aircraft. In 1996, based aircraft at Kingman Airport represented 0.02 percent of U.S. active general aviation aircraft. The airport's market share increased slightly over the following years, representing 0.05 percent in 2003. This indicates that based aircraft have been growing at a faster rate than active aircraft, nationally. A constant share projection was first developed. This forecast assumes the airport's share of U.S. active general aviation aircraft will remain constant at 0.05 percent through the planning period, which yields 131 based aircraft by the year 2023. The second forecast assumes the airport's market share will increase, consistent with historical trends. This increasing market share projection yields 236 based aircraft by the year 2023. These market share projections are presented in **Table 2Q**.

TABLE 2Q
General Aviation Based Aircraft
Share of U.S. Active General Aviation (GA) Aircraft
Kingman Airport

Year	Kingman Airport Based Aircraft	U.S. Active GA Aircraft	% of U.S. Active GA Aircraft
1996	45	191,129	0.02%
1998	60	204,710	0.03%
2002	85	211,040	0.04%
2003	112	211,370	0.05%
Constant Market Share			
2008	116	232,725	0.05%
2013	121	242,915	0.05%
2018	126	252,500[1]	0.05%
2023	131	262,300[1]	0.05%
Increasing Market Share			
2008	140	232,725	0.06%
2013	170	242,915	0.07%
2018	202	252,500[1]	0.08%
2023	236	262,300[1]	0.09%

Source: Historical Based Aircraft – Airport Records; Historical and Forecast U.S. Active Aircraft – FAA Aerospace Forecasts, Fiscal Years 2004-2015.
[1] Extrapolated by Coffman Associates.

Finally, based aircraft were examined as a ratio of Mohave County residents. This analysis is summarized in **Table 2R**. Two forecasts have been prepared. The first examines based aircraft potential by applying the 2003 ratio of 0.62 based aircraft per 1,000 residents to forecast Mohave County population. The constant ratio of based aircraft to 1,000 residents projection results in based aircraft growing at the same rate as the local population. This yields 154 based aircraft by 2023. With the expanding population base and economic growth in the area, the potential exists for based aircraft growth at the airport to exceed the projected population growth. This has been the trend in the past, as the ratio of based aircraft to population has been increasing annually. An increasing ratio yields 235 based aircraft in 2023.

TABLE 2R
General Aviation Based Aircraft Per 1,000 Residents (Mohave County)
Kingman Airport

Year	Kingman Airport Based Aircraft	Mohave County Population	Based Aircraft Per 1,000 Residents
1996	45	126,641	0.36
1998	60	140,119	0.43
2002	85	171,532	0.50
2003	112	180,431	0.62
Constant Share Projection			
2008	115	185,400	0.62
2013	129	207,500	0.62
2018	142	228,400	0.62
2023	154	247,800	0.62
Increasing Share Projection			
2008	121	185,400	0.65
2013	156	207,500	0.75
2018	194	228,400	0.85
2023	235	247,800	0.95

Source: Historical Based Aircraft – Airport Records; Historical Population – U.S. Census Bureau; Forecast Population – Arizona Department of Economic Security, Population Statistics Unit.

For comparative purposes, projections for the FAA TAF, 2000 SANS, and previous Kingman Airport Master Plan have also been examined. The FAA TAF used a base year total of 252 based aircraft and projected 416 based aircraft at Kingman Airport by the year 2020. The 2000 Arizona SANS projected based aircraft growing from 180 in 1998, to 221 by 2020. The forecast included in the 1991 Airport Master Plan, projected based aircraft growing from 78 in 1989, to 156 based aircraft by 2010.

The FAA TAF and the 2000 SANS did not separate based aircraft and stored aircraft, as these forecasts have.

Therefore, the based aircraft totals are not comparable; however, the projected growth rates are useful for comparison. The FAA TAF projects based aircraft growing at an average annual growth rate of 2.8 percent. The 2000 SANS projects based aircraft growing at an average annual growth rate of 0.9 percent. The aircraft storage business was not located at Kingman Airport when the 1991 Airport Master Plan was prepared; therefore, it did not consider the potential for stored aircraft. The 1991 Master Plan projected based aircraft growing at an average annual rate of 3.4 percent.

Table 2S and **Exhibit 2D** provide a summary of all general aviation based aircraft forecasts. The Constant Share of Mohave County Registered Aircraft, Constant Share of U.S. Active Aircraft, and Constant Ratio of Aircraft to Residents forecasts appear to understate growth potential, considering the historical growth at the airport. However, the increasing share forecasts may overstate the growth potential in the long term. Therefore, a selected planning forecast was developed that is approximately mid-range in the forecast envelope. The selected planning forecast accounts for the historical growth trend at the airport, but slows this growth over the planning period. The planning forecast projects based aircraft growing at an average annual rate of 2.9 percent, which is comparable to the FAA TAF's projected growth rate of 2.8 percent annually.

TABLE 2S
Summary of General Aviation Based Aircraft Forecasts
Kingman Airport

	2003	2008	2013	2018	2023
Market Share of Registered Aircraft (Mohave Co.)					
Constant Market Share		125	138	152	168
Increasing Market Share		135	160	191	224
Market Share of U.S. Active GA Aircraft					
Constant Market Share		116	121	126	131
Increasing Market Share		140	170	202	236
Aircraft Per 1,000 Residents (Mohave Co.)					
Constant Ratio Projection		115	129	142	154
Increasing Ratio Projection		121	156	194	235
Selected Planning Forecast	**112**	**130**	**150**	**175**	**200**

Based Aircraft Fleet Mix

Knowing the aircraft fleet mix expected to utilize the airport is necessary to properly plan facilities that will best serve the level of activity and the type of activities occurring at the airport. **Table 2T** indicates that the May 2004 based aircraft fleet mix is comprised mainly of single-engine piston aircraft. The based aircraft fleet mix has been examined as a share of total based aircraft.

The fleet mix projection includes a growing percentage of turboprop and turbojet aircraft at the airport, similar to national trends. The FAA expects

turbine-powered, fixed-wing aircraft (turboprop and turbojet) to grow at an average annual rate of 3.6 percent through 2015. The jet portion of this fleet is expected to grow at an average annual growth rate of 5.1 percent.

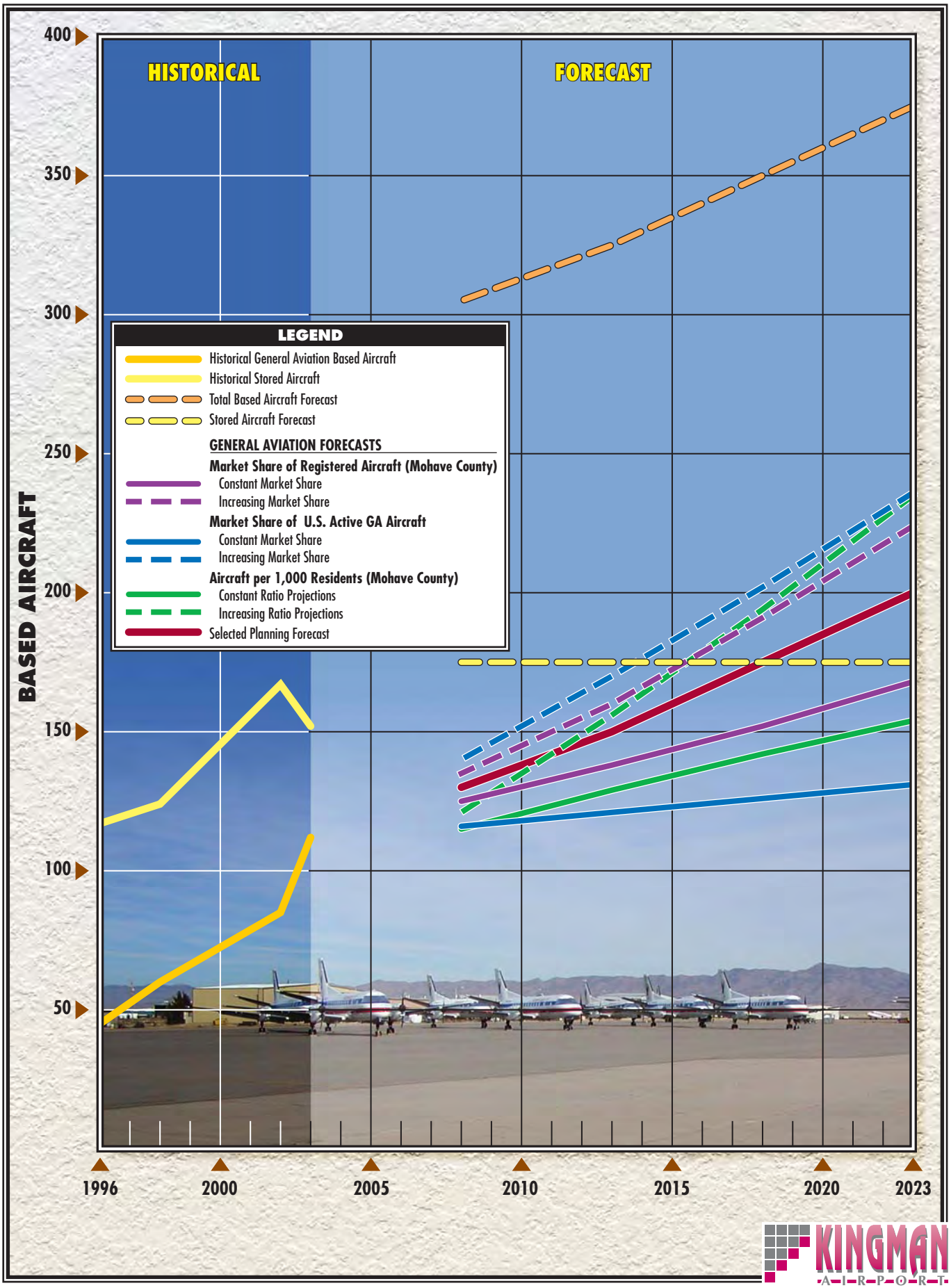
While the single-engine piston category remains static as a percentage of total based aircraft, the total number of single-engine piston aircraft is expected to grow by 77, the highest numerical change of all aircraft categories. Local economic and population growth will add new private aircraft ownership. The new regulations for sport aircraft should increase single-engine based aircraft levels as well. The FAA is finalizing new legislation for sport aircraft. This will create a new category of aircraft and a more simplified approval and manufacturing process. This new rule-making is expected to result in 300 to 500 new aircraft each year, beginning in 2006. By 2015, this results in between 2,700 and 4,500 new single-engine piston aircraft. The traditional single-engine piston fleet is expected to grow by an additional 5,100 aircraft in the next 12 years as well.

TABLE 2T
General Aviation Based Aircraft Fleet Mix

Year	Total	Single-engine Piston	Multi-Engine Piston	Turboprop	Turbojet	Helicopter
2004	103	83	18	0	0	2
Percentage Share						
2004	100.0%	80.6%	17.5%	0.0%	0.0%	1.9%
Forecast						
2008	130	105	20	1	1	3
2013	150	121	22	2	2	3
2018	175	140	24	3	4	4
2023	200	160	26	4	6	4
Percentage Share						
2008	100.0%	80.5%	15.5%	1.0%	1.0%	2.0%
2013	100.0%	80.5%	14.5%	1.5%	1.5%	2.0%
2018	100.0%	81.0%	13.5%	1.5%	2.0%	2.0%
2023	100.0%	80.0%	13.0%	2.0%	3.0%	2.0%
Change	97	77	8	4	6	2

Source for Historical Data: Airport Records

Multi-engine piston aircraft decline as a percentage, adding only eight new aircraft through the planning period. Nationally, the multi-engine piston mix is expected to decline. The cost of a new multi-engine piston aircraft is comparable to many used turboprops, which has led to their decline in use. The operational costs are also too high for widespread recreational aircraft



KINGMAN AIRPORT

Exhibit 2D
BASED AIRCRAFT FORECASTS

ownership and use. For perspective, GAMA reports that only 71 new multi-engine piston aircraft were built and delivered worldwide in 2003. This compares with over 1,800 new single-engine piston aircraft and 500 business jets. Multi-engine piston aircraft will always have a place in new pilot training and some aircraft charter activities.

The helicopter percentage is maintained constant through the planning period. This allows for some growth in this category at the airport. Nationally, the number of helicopters is declining. The FAA projects very little change in the helicopter fleet over the next 12 years. The FAA projects only 300 new piston-engine helicopters and 260 new turbine-powered helicopters by 2015. This indicates that the supply of new helicopters will only barely keep pace with helicopter retirements and that there is not an expected significant expansion of current helicopter activities nationwide.

General Aviation Operations

General aviation operations are classified as either local or itinerant. A local operation is a take-off or landing performed by an aircraft that operates within sight of the airport, or which executes simulated approaches or touch-and-go operations at the airport. Itinerant operations are those performed by aircraft with a specific origin or destination away from the airport. Generally, local operations are characterized by training operations.

Due to an absence of an airport traffic control tower (ATCT), actual operation counts are not available for Kingman Airport. Instead, only estimates of operations are available. Historical estimates of aircraft operations are summarized in the FAA TAF. **Table 2U** summarizes historical general aviation operational estimates since 1990 for Kingman Airport. As shown in the table, annual general aviation operations have grown since 1990, increasing by 62 percent.

General aviation operations have been examined as a ratio of general aviation based aircraft. As shown in **Table 2U**, the 2002 estimate of 45,320 annual general aviation operations equates to 533 operations per based aircraft. The FAA TAF does not provide an estimate for operations in 2003,which is a forecast year. Assuming that the operations in 2003 were similar to 2002, the operations per based aircraft would fall to approximately 400, as based aircraft increased in 2003. Operations per based aircraft generally range between 250 and 600 at general aviation airports. The higher operations per based aircraft are experienced at airports with higher numbers of local operations than itinerant operations. Kingman Airport has an active flight school which has led to growing numbers of local operations since 1990. In 2002, it was estimated that local operations accounted for approximately 60 percent of total general aviation operations.

TABLE 2U
Historical General Aviation Operations

Year	Itinerant	Local	Total
1990	8,902	19,023	27,925
1995	17,769	4,286	22,055
2000	20,243	10,428	30,671
2001	20,300	10,400	30,700
2002	17,320	28,000	45,320

Source: FAA TAF

As shown in **Table 2V**, applying the estimated 2003 operations per based aircraft ratio of 400 to forecast based aircraft yields 80,000 annual general aviation operations in 2023. Increasing the operations per based aircraft ratio yields 90,000 annual operations by 2023.

The 2000 SANS and FAA TAF have been examined for comparative purposes. The 2000 SANS projected operations growing from 33,000 in 1998, to 40,563 by 2020. The FAA TAF projects annual operations static at 30,700 through 2020.

TABLE 2V
Annual GA Operations Forecasts
Kingman Airport

Year	Based Aircraft	Itinerant Operations	% of Total	Local Operations	% of Total	Total Operations	Ops Per Based
2003	112	17,320	38.22%	28,000	61.78%	45,320	404
Constant Ratio Projection							
2008	130	20,800	40.00%	31,200	60.00%	52,000	400
2013	150	27,000	45.00%	33,000	55.00%	60,000	400
2018	175	31,500	45.00%	38,500	55.00%	70,000	400
2023	200	36,000	45.00%	44,000	55.00%	80,000	400
Increasing Ratio Projection							
2008	130	21,300	40.00%	32,000	60.00%	53,300	410
2013	150	28,400	45.00%	34,700	55.00%	63,000	420
2018	175	33,900	45.00%	41,400	55.00%	75,300	430
2023	200	40,500	45.00%	49,500	55.00%	90,000	450
Selected Planning Forecast							
2008	130	21,100	40.00%	31,600	60.00%	52,700	405
2013	150	27,700	45.00%	33,800	55.00%	61,500	410
2018	175	32,700	45.00%	40,000	55.00%	72,700	415
2023	200	38,300	45.00%	46,800	55.00%	85,100	425

Source for historical operations - FAA TAF.

The FAA projects an increase in aircraft utilization and the number of general aviation hours flown nationally. This trend, along with projected growth in based aircraft, supports future growth in annual operations at Kingman Airport. Considering these factors, the selected planning forecast for the airport projects the number of operations per based aircraft to gradually increase through the planning period. The selected planning forecast is a mid-range forecast, which results in general aviation operations growing to 85,000 by 2023. This is an average annual growth rate of 3.0 percent. Itinerant operations are projected to increase to 45 percent of total

general aviation operations as the number of turbine-powered aircraft based at the airport grows. **Exhibit 2E** depicts the general aviation operations forecast.

Total Based Aircraft

As detailed earlier, the total based aircraft at Kingman Airport includes both the general aviation based aircraft and the aircraft stored by one of the tenants at the airport. The demand for stored aircraft will be a factor of the airline industry's business decisions to retire older aircraft and replace them with new, the ability of the local business to attract aircraft for storage, and the status of the used aircraft market. If the used aircraft market is strong, the number of stored aircraft may decline as aircraft are utilized. However, should the airline industry growth slow, the number of stored aircraft could increase. After 9/11, many airlines retired older aircraft or took aircraft out of service while demand was slow. Each of these factors is very difficult to predict. Nationally, there are no firm projections for aircraft retirements or the status of the used aircraft market. Therefore, the number of stored aircraft has been projected to remain static at 175 aircraft through the planning period. This exceeds the highest total at the airport since 1996, and accounts for some growth in this sector. It is expected that the mix of stored aircraft would change over time but include both turboprop and turbojet aircraft. **Table 2W** summarizes total based aircraft projections for Kingman Airport.

TABLE 2W
Total Based Aircraft Forecasts
Kingman Airport

	2003	2008	2013	2018	2023
General Aviation Based Aircraft	112	130	150	175	200
Stored Aircraft	152	175	175	175	175
Selected Planning Forecast	**264**	**305**	**325**	**350**	**375**

MILITARY OPERATIONS

Military activity accounts for the smallest portion of the operational traffic at Kingman Airport. Since 1999, military operations have accounted for less 300 itinerant operations annually. There have been no local military operations. Unless there is an unforeseen mission change in the area, a significant change from these average figures is not anticipated. Therefore, annual military operations have been projected at these annual levels throughout the planning period. This is consistent with typical industry practices for projecting military operations.

PEAKING CHARACTERISTICS

Most facility planning relates to levels of peak activity. The following planning definitions apply to the peak periods:

- Peak Month – The calendar month when peak aircraft operations occur.
- Design Day – The average day in the peak month.
- Busy Day – The busy day of a typical week in the peak month.
- Design Hour – The peak hour within the design day.

It is important to note that only the peak month is an absolute peak within a given year. All other peak periods will be exceeded at various times during the year. However, they do represent reasonable planning standards that can be applied without overbuilding or being too restrictive. The design day is normally derived by dividing the peak month operations or enplanements by the number of days in the month.

Airline Peaks

Historical airport records were examined to determine the peak month for passenger enplanements at Kingman Airport. In 2003, the peak month for enplanements was October, when the airport captured approximately 11.5 percent of total enplanements. This percentage has been applied to the forecast annual enplanements to determine future peak month enplanements levels. The design day enplanements were calculated by dividing the number of enplanements in the peak month by 30 to represent an average month. Design hour enplanements equal the projection of enplanements per departure developed earlier as part of the commercial operations forecast. The enplanements per departure are determined by applying a BLF to the projected number of seats available per departure.

According to airport records, the peak month for airline operations in 2003 was July, when the airport captured approximately 10.0 percent of annual operations. This percentage was applied to forecast operations. In 2003, the airport had three daily departures, or six total operations. This represents the design day. The peak hour had one departure and landing operation, for two total operations. Average day and peak hour operations were projected to increase later in the planning period when additional daily flights might be added. A summary of the forecasts for peak period airline enplanements and operations is presented in **Table 2X**.

General Aviation Peaks

Without an airport traffic control tower, adequate operational information is not available to directly determine peak operational activity at the airport. Therefore, peak period forecasts have been determined according to trends experienced at similar airports and by examining the operational counts completed at the airport in 2002. Typically, the peak month for activity at general aviation airports approximates 10 to 15 percent of the

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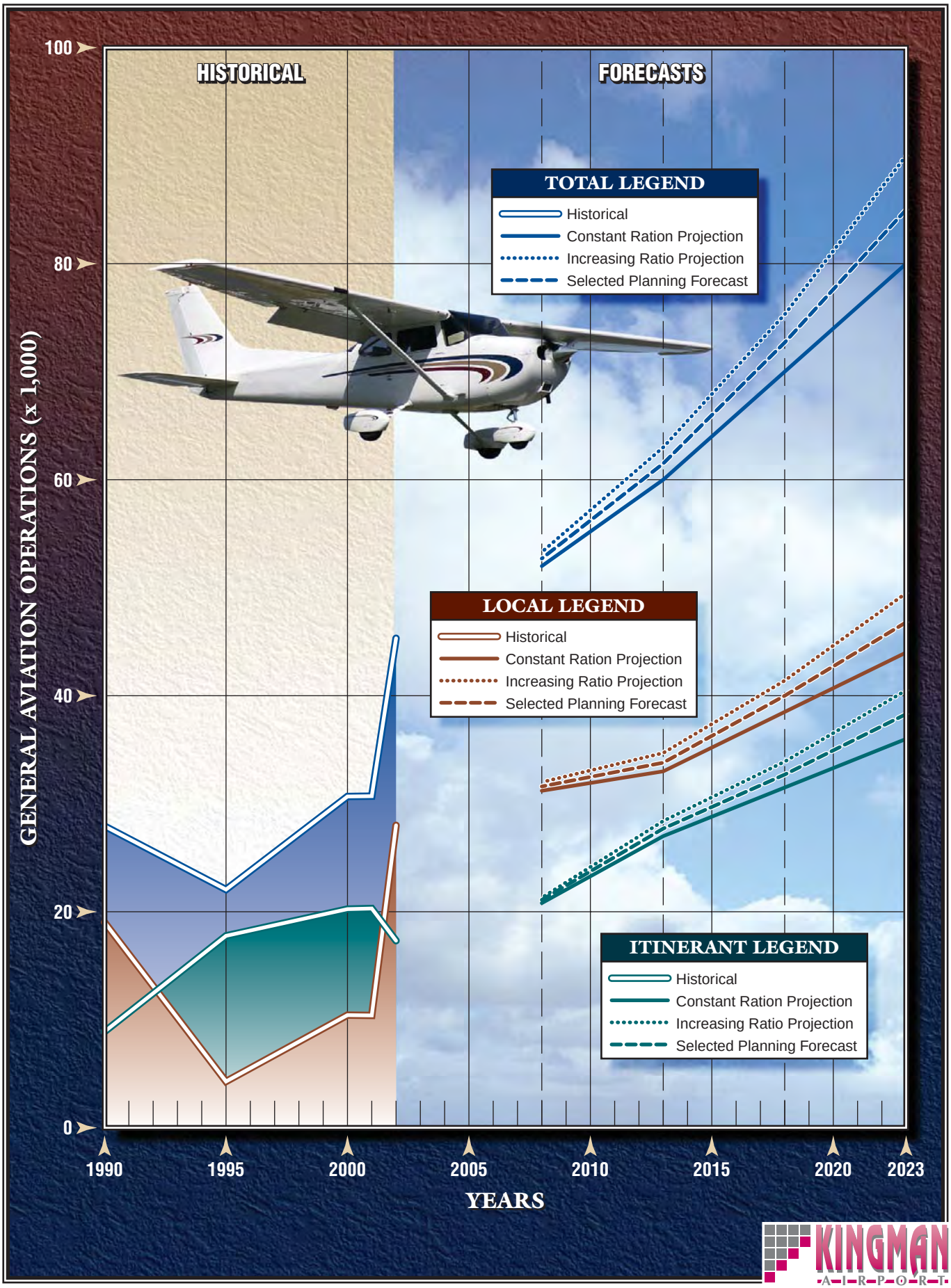


KINGMAN AIRPORT

Exhibit 2E
GENERAL AVIATION
OPERATIONS FORECASTS

airport's annual operations. General aviation itinerant operations and total operations were estimated at 12 percent of total annual operations. The forecast of busy day operations was calculated as 1.25 times design day activity. Design hour operations were estimated at 15 percent of design day operations. **Table 2X** summarizes peak operations forecasts for the airport.

TABLE 2X
Peak Period Forecasts
Kingman Airport

	FORECASTS				
	2003	**2008**	**2013**	**2018**	**2023**
Airline Enplanements					
Annual	2,313	5,400	6,800	10,100	15,000
Peak Month	266	621	782	1,162	1,725
Design Day	9	21	26	39	58
Design Hour	3	7	9	13	19
Airline Operations					
Annual	1,582	2,800	2,900	3,200	3,800
Peak Month	158	283	293	323	384
Design Day	6	6	6	8	10
Design Hour	2	2	2	3	3
General Aviation Itinerant Operations					
Annual	17,320	21,100	27,700	32,700	38,300
Peak Month	2,078	2,532	3,324	3,924	4,596
Design Day	67	82	107	127	148
Busy Day	84	102	134	158	185
Design Hour	13	15	20	24	28
All Operations					
Annual	47,980	56,700	65,800	77,400	90,700
Peak Month	5,758	6,804	7,896	9,288	10,884
Design Day	186	219	255	300	351
Busy Day	232	274	318	375	439
Design Hour	35	41	48	56	66

ANNUAL INSTRUMENT APPROACHES

Forecasts of annual instrument approaches (AIAs) provide guidance in determining an airport's requirements for navigational aid facilities. An instrument approach is defined by the FAA as "an approach to an airport with the intent to land by an aircraft in accordance with an instrument flight rule (IFR) plan, when visibility is less than three miles and/or when the ceiling is at or below the minimum initial approach altitude."

In 2003, the airport reported 83 AIAs, which accounted for 0.4 percent of total itinerant operations. While AIAs can be partially attributed to weather, they may be expected to increase as transient operations and operations by more sophisticated aircraft increase throughout the planning period.

Therefore, AIAs as a percentage of itinerant operations are expected to increase throughout the planning period. The projections of AIAs for Kingman Airport are summarized in **Table 2Y**.

TABLE 2Y
Annual Instrument Approaches (AIAs)
Kingman Airport

Year	Annual Instrument Approaches	Itinerant Operations	AIAs % of Itinerant Operations
2003	83	19,980	0.4%
FORECAST			
2008	136	25,100	0.5%
2013	192	32,000	0.6%
2018	262	37,400	0.7%
2023	439	43,900	1.0%

Source: Historical AIAs – FAA APO.

SUMMARY

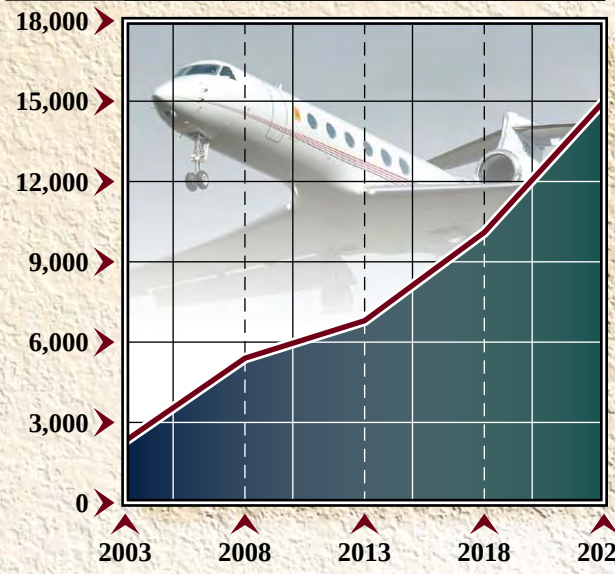
This chapter has provided forecasts for each sector of aviation demand anticipated over the planning period. **Exhibit 2F** presents a summary of the aviation forecasts developed for Kingman Airport. The airport is expected to experience an increase in total based aircraft, annual operations, and annual enplaned passengers throughout the planning period. The next step in this study is to assess the capacity of the existing facilities to accommodate forecast demand and determine what types of facilities will be needed to meet these demands.

Forecasts for future enplaned air cargo have not been developed. A change in the role of air cargo service at the airport is not expected through the planning period. The airport is expected to continue to be served by feeder aircraft to regional hubs. The integrated air cargo companies are expanding their ground transportation network for cost savings. This is reducing their needs for new airport hub locations. With this understanding, it can be assumed that the airport will be served by both piston-powered and turboprop aircraft in the future. These aircraft can easily be accommodated on existing apron areas.

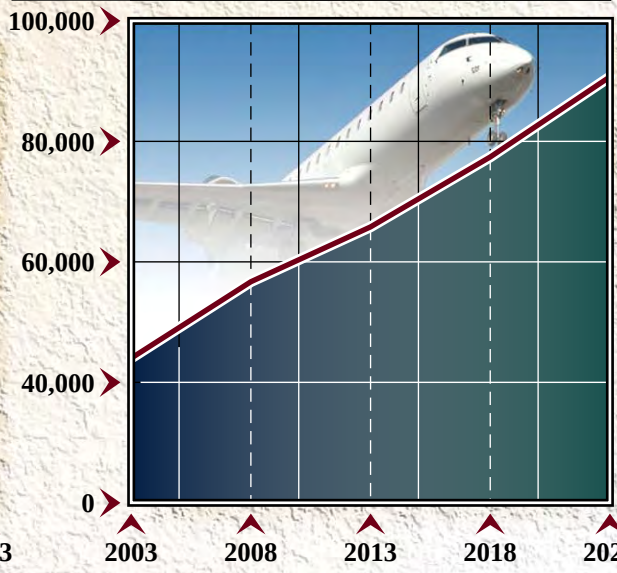
SUMMARY OF AVIATION ACTIVITY FORECASTS

CATEGORY	Historical	Forecasts 2008	2013	2018	2023
ANNUAL ENPLANEMENTS					
Airport Total	**2,313**	**5,400**	**6,800**	**10,100**	**15,000**
ANNUAL OPERATIONS					
Itinerant					
Air Carrier	1,582	2,800	2,900	3,200	3,800
Air Taxi	778	900	1,100	1,200	1,500
General Aviation	17,320	21,100	27,700	32,700	38,300
Military	300	300	300	300	300
Total Itinerant	***19,980***	***25,100***	***32,000***	***37,400***	***43,900***
Local					
General Aviation	28,000	31,600	33,800	40,000	46,800
Total Local	***28,000***	***31,600***	***33,800***	***40,000***	***46,800***
Total Operations	**47,980**	**56,700**	**65,800**	**77,400**	**90,700**
ANNUAL INSTRUMENT APPROACHES (AIAs)					
Airport Total	**83**	**136**	**192**	**262**	**439**
BASED AIRCRAFT					
General Aviation Based Aircraft					
Single-Engine	83	105	121	140	160
Multi-Engine	18	20	22	24	26
Turboprop	0	1	2	3	4
Turbojet	0	1	2	4	6
Helicopters	2	3	3	4	4
Total GA Based Aircraft	***103***	***130***	***150***	***175***	***200***
Stored Aircraft		175	175	175	175
Total Based Aircraft		**305**	**325**	**350**	**375**

ENPLANEMENTS FORECAST



OPERATIONS FORECAST



KINGMAN AIRPORT

Exhibit 2F
FORECAST SUMMARY