Chapter Two

AVIATION DEMAND FORECASTS

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An important factor in facility planning involves a definition of demand that may reasonably be expected to occur during the useful life of the facility's key components. For Lake Havasu City Municipal Airport, this involves projecting potential aviation demand for a 20-year timeframe. In this Master Plan, forecasts of passenger enplanements, based aircraft, and operations (takeoffs and landings) will be considered which will serve as the basis for facility planning.

The aviation demand forecasts presented in this chapter have been prepared using airport-specific data provided by airport management, as well as data compiled by the Arizona Department of Transportation (ADOT) – Aeronautics Division and the Federal Aviation Administration (FAA). In addition, updated national forecasts in the publication *FAA Aerospace Forecasts – Fiscal Years 2007-2020* were referenced for industry trends.

The FAA has oversight responsibility to review and approve aviation forecasts developed in conjunction with airport planning studies. The FAA reviews such forecasts with the objective of comparing them to its *Terminal Area Forecasts (TAF) and the National Plan of Integrated Airport Systems* (NPIAS). In addition, aviation activity forecasts are an important input to the benefit-cost analyses associated with airport development, and FAA reviews these analyses when federal funding requests are submitted.

As stated in FAA Order 5090.3C, *Field Formulation of the National Plan of Integrated Airport Systems*, dated December 4, 2004, forecasts should be:

- Realistic
- Based on the latest available data
- Reflect current conditions at the airport
- Supported by information in the study
- Provide adequate justification for airport planning and development

Recognizing this, it is intended to develop a Master Plan for Lake Havasu City Municipal Airport that will be demand-based rather than time-based. As a result, the reasonable levels of activity potential that are derived from this forecasting effort will be related to the planning horizon levels rather than dates in time. These planning levels will be established as levels of activity from which specific actions for the airport to consider will be presented.

The demand-based manner in which this Master Plan is being prepared is intended to accommodate variations in demand at the airport. Demand-based planning relates capital improvements to demand factors such as based aircraft operations, instead of points in time. This allows the airport to address capital improvement needs according to actual demand occurring at the airport. Therefore, should growth in aircraft operations or based aircraft slow or decline, it may not be necessary to implement some improvement projects. However, should the airport experience accelerated growth, the plan will have accounted for that growth and will be flexible enough to respond accordingly.

In order to fully assess current and future aviation demand for Lake Havasu City Municipal 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 competing transportation modes and facilities. Consideration and analysis of these factors will ensure a comprehensive outlook for future aviation demand at Lake Havasu City Municipal Airport.

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, air cargo, 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 2007-2020*, published in March 2007. 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 September 11, 2001, 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. The economic climate and aviation industry, however, has been on the recovery.

The Office of Management and Budget (OMB) expects the U.S. economy to continue to grow in terms of Gross Domestic Product (GDP) at an average annual rate of 2.9 percent through 2020. This will positively influence the aviation industry, leading to passenger, air cargo, and general aviation growth throughout the forecast period (assuming there will be no new successful terrorists incidents against either U.S. or world aviation).

The FAA forecasts for commercial aviation projects a return to growth, and, over time, the industry is expected to grow significantly. System capacity, the yard stick for measuring the health of the aviation industry, is projected to increase 2.8 percent in 2007, following a decline of 0.2 percent in 2006. In domestic markets, capacity is expected to increase 2.1 percent annually, as legacy network capacity stabilizes and low-cost carriers continue to grow. Regional carrier capacity is forecast to increase 2.9 percent annually, as legacy carriers transfer routes to regional partners and the regionals offer more point-to-point service. Revenue passenger miles (RPMs) are forecast to increase 2.8 percent annually, while enplanements are expected to increase faster, up 3.6 percent annually.

U.S. airline passenger enplanements (combined domestic and international) have now exceeded pre-9/11 levels and are projected to grow at an average of 3.5 percent annually through 2020. Mainline air carriers are forecast to grow 3.7 percent annually, while the regional/commuter airlines are forecast to level off at 3.1 percent annually, after having experienced unprecedented 11.2 percent annual growth from 2000-2006.

Growth in the general aviation sector is expected to continue to be strong, particularly with the introduction of very light jets (VLJs) to the fleet. These relatively inexpensive microjets may redefine "on-demand" air taxi service. In 2008, over 350 VLJs are forecast to enter the fleet, with that figure growing to 400-500 per year through 2020. Overall, general aviation hours flown are projected to increase an average of 3.4 percent per year through 2020. The number of active general aviation aircraft is expected to grow at 1.4 percent annually.

U.S. airline air cargo revenue-ton-miles (RTMs) are projected to grow at 5.6 percent annually.

GENERAL AVIATION

In the 13 years since the passage of the *General Aviation Revitalization Act of 1994* (federal legislation which limits the liability on general aviation aircraft to 18 years from the date of manufacture), it is clear that the Act has successfully infused new life into the general aviation industry. 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.

After the passage of this legislation, annual shipments of new aircraft rose every year between 1994 and 2000. 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. As shown in **Table 2A**, the growth in the general aviation industry slowed considerably after 2000, negatively impacted by the national economic recession and the events surrounding 9/11. In 2003, there were over 450 fewer aircraft shipments than in 2000, a decline of 14 percent.

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	1,862	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
2004	2,963	1,999	52	321	591	11,903.8
2005	3,580	2,326	139	365	750	15,140.0
2006	4,042	2,508	242	407	885	18,793.0

SEP - Single Engine Piston; MEP - Multi-Engine Piston; TP - Turboprop; J - Turbofan/Turbojet

Source: GAMA

In 2004, the general aviation production showed a significant increase, returning to near pre-9/11 levels for most indicators. With the exception of multi-engine piston aircraft deliveries, deliveries of new aircraft in all categories increased. In 2006, total aircraft deliveries increased 12 percent. The largest increase was in single engine piston aircraft deliveries that increased seven percent or by over 180 aircraft. Turbojet and multi-engine piston aircraft also increased significantly from the previous year. As evidenced in the table, new aircraft deliveries in 2006 exceeded pre-9/11 levels by approximately 1,000 aircraft.

On July 21, 2004, the FAA published the final rule for sport aircraft: The *Certification of Aircraft and Airmen for the Operation of Light-Sport Aircraft* rules, which went into effect on September 1, 2004. This final rule establishes new light-sport aircraft categories and allows aircraft manufacturers to build and sell completed aircraft without obtaining type and production certificates. Instead, aircraft manufacturers will 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 "slow

(less than 120 knots maximum) and simple" performance aircraft. New pilot training times are reduced and offer more flexibility in the type of aircraft 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 rule 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. Since 2004, there have been over 30 new product offerings in the airplane category alone. These regulations are aimed primarily at the recreational aircraft owner/operator. By 2020, there are expected to be 13,200 of these aircraft in the national fleet.

While impacting aircraft production and delivery, the events of 9/11 and 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 approximately 1,500 between 2000 and 2005. Corporate operators are defined as those companies that have their own flight departments and utilize general aviation aircraft to enhance productivity. **Table 2B** summarizes the number of U.S. companies operating fixed-wing turbine aircraft between 1991 and 2005.

TABLE 2B
U.S. Companies Operating Fixed-Wing Turbine Business Aircraft and Number of Aircraft, 1991-2005

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
2004	10,735	16,369
2005	10,809	16,867

Source: GAMA/NBAA

The growth in corporate operators comes at a time when fractional aircraft programs are experiencing significant growth. Fractional ownership programs sell a share 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 between 1986 and 2005. The number of aircraft in fractional jet programs grew rapidly from 2001 to 2005, increasing by approximately 250. Although there is no data available, it can be projected that fractional shares and aircraft have increased even more since 2005.

TABLE 2C
Fractional Shares and Number of Aircraft in Use

Year	Number of Shares	Number of Aircraft
1986	3	N/A
1987	5	N/A
1988	26	N/A
1989	51	N/A
1990	57	N/A
1991	71	N/A
1992	84	N/A
1993	110	N/A
1994	158	N/A
1995	285	N/A
1996	548	N/A
1997	957	N/A
1998	1,551	N/A
1999	2,607	N/A
2000	3,834	N/A
2001	3,415	696
2002	4,098	776
2003	4,516	826
2004	4,765	865
2005	4,691	949

Source: GAMA

Very light jets (VLJs) entered the operational fleet in 2006. Also known as microjets, the VLJ is commonly defined as a jet aircraft that weighs less than 10,000 pounds. There are several new aircraft that fall in this category including the Eclipse 500 and Adams 700 jets. While not categorized by Cessna Aircraft as a VLJ, the Cessna Mustang is a competing aircraft to many of the VLJs expected to reach the market. These jets cost between $1 and $2 million, can takeoff on runways less than 3,000 feet, and cruise at 41,000 feet at speeds in excess of 300 knots. The VLJ is expected to redefine the business jet segment by expanding business jet flying and offering operational costs that can support on-demand air taxi point-to-point service. The FAA projects 350 VLJs in service in 2007. This category of aircraft is expected to grow by 400 to 500 aircraft per year, reaching 6,300 aircraft by 2020.

The FAA forecast assumes that the regulatory environment affecting general aviation will not change dramatically. It is expected that the U.S. economy will continue to expand through 2007 and 2008, and then continue to grow moderately (near three percent annually) 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 terrorist incidents against either the U.S. or world aviation). The FAA does recognize that a major risk to continued economic growth is upward pressure on commodity prices, including the price of oil. However, FAA economic models predict a 4.8 percent decrease in the price of oil in 2007, followed by a 7.1 percent in-

crease in 2008. The price of oil is expected to become somewhat less volatile through the remainder of the forecast period.

The FAA projects the active general aviation aircraft fleet to increase at an average annual rate of 1.4 percent over the 14-year forecast period, increasing from 226,422 in 2006 to 274,914 in 2020. This growth is depicted on **Exhibit 2A**. FAA forecasts identify two general aviation economies that follow different market patterns. The turbine aircraft fleet is expected to increase at an average annual rate of 6.0 percent, increasing from 18,058 in 2006 to 31,558 in 2020. Factors leading to this substantial growth include expected strong U.S. and global economic growth, the continued success of fractional-ownership programs, the growth of the VLJ/microjet market, and a continuation of the shift from commercial air travel to corporate/business air travel by business travelers and corporations. Piston-powered aircraft are projected to show minimal growth through 2020 at 0.3 percent annually. Single engine piston aircraft are projected to grow at 0.3 percent annually while multi-engine piston aircraft are projected to decrease in number by 0.2 percent annually. Piston-powered rotorcraft aircraft are forecast to increase by 5.7 percent annually through 2020.

Aircraft utilization rates are projected to increase through the 14-year forecast period. The number of general aviation hours flown is projected to increase at 3.4 percent annually. Similar to active aircraft projections, there is projected disparity between piston and turbine aircraft hours flown. Hours flown in turbine aircraft are expected to increase at 6.1 percent annually, compared with 1.3 percent for piston-powered aircraft. Jet aircraft are projected to increase at 9.4 percent annually over the next 14 years, being the largest increase in any one category for total aircraft hours flown.

The total pilot population is projected to increase by 51,000 in the next 14 years, from an estimated 455,000 in 2006 to 506,000 in 2020, which represents an average annual growth rate of 0.8 percent. The student pilot population is forecast to increase at an annual rate of 1.2 percent, reaching a total of 100,181 in 2020. Growth rates for other pilot categories over the forecast period are as follows: recreational pilots declining 0.1 percent; commercial pilots increasing 0.8 percent; airline transport pilots increasing 0.2 percent; rotorcraft-only pilots increasing 3.1 percent; glider-only pilots increasing 0.4 percent; and private pilots showing no change. The sport pilot is expected to grow significantly through 2020 at 22.6 percent annually. The decline in recreational pilots and no increase in private pilots is the result of the expectation that most new general aviation pilots will choose to obtain the sport pilot license instead.

Over the past several years, the general aviation industry has launched a series of programs and initiatives whose main goals are to promote and assure future growth within the industry. The “No Plane, No Gain” is an advocacy program created in 1992 by

GAMA and the National Business Aircraft Association (NBAA) to promote acceptance and increased use of general aviation as an essential, cost-effective tool for businesses. Other programs are intended to promote growth in new pilot starts and introduce people to general aviation. "Project Pilot," sponsored by the Aircraft Owners and Pilots Association (AOPA), promotes the training of new pilots in order to increase and maintain the size of the pilot population. The "Be A Pilot" program is jointly sponsored and supported by more than 100 industry organizations. The NBAA sponsors "AvKids," a program designed to educate elementary school students about the benefits of business aviation to the community and career opportunities available to them in business aviation. The Experimental Aircraft Association (EAA) promotes the "Young Eagles" program which introduces young children to aviation by offering them a free airplane ride courtesy of aircraft owners who are part of the association. 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.

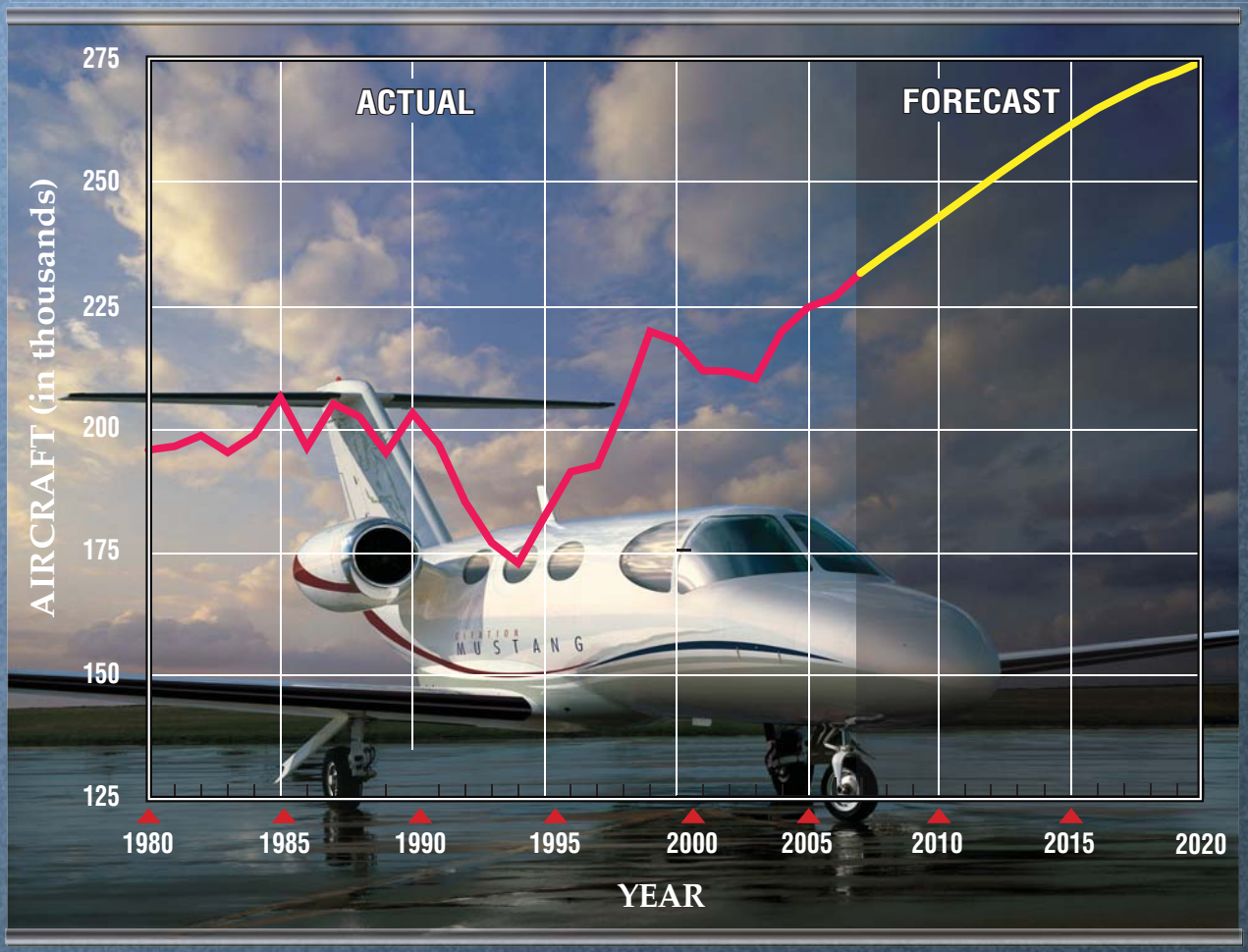
COMMERCIAL PASSENGER AIRLINES

The passenger airlines in the United States are comprised of 33 mainline carriers and 81 regional carriers. The mainline carriers are airlines that primarily use passenger jets with over 90 seats, while the regional carriers are airlines that primarily use smaller propeller and jet aircraft with fewer than 90 seats. The mainline carriers have also emerged into two other groupings: legacy network carriers and low-cost carriers.

Legacy Network Carriers – This group includes the airlines established prior to deregulation in 1978 (e.g., American Airlines, Continental Airlines, Delta Airlines, Northwest Airlines, United Airlines, US Airways). The legacy airlines were the most impacted by 9/11, and now are undergoing restructuring efforts to redefine their business model in the new operating environment of the industry. These airlines operate primarily in hub-and-spoke networks and generally have higher operating costs. The legacy airlines have been downsizing and cost-cutting to become competitive with the low-cost carriers. The string of negative external events, out of the control of airlines, has made it difficult for most legacy carriers to achieve profitability.

Low-Cost Carriers – This group is comprised of established low-cost carriers, new entrants, and a few restructured legacy carriers (American Trans Air [ATA], AirTran, Frontier Airlines, JetBlue Airways, Southwest Airlines, and Spirit Airlines). These carriers typically operate point-to-point and have lower operating costs than their legacy counterparts. Their post-9/11 strategy has seen growth in airports and city-pairs served, aircraft fleet, and longer-haul flights. The recent sharp increases in oil prices have impacted the profits of the low-cost airlines.

U.S. ACTIVE GENERAL AVIATION AIRCRAFT



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

Year	FIXED WING				ROTORCRAFT		Experimental	Sport Aircraft	Other	Total
	PISTON		TURBINE							
	Single Engine	Multi-Engine	Turboprop	Turbojet	Piston	Turbine				
2006 (Est.)	148.2	19.4	8.0	10.0	3.4	5.9	24.5	0.4	6.6	226.4
2010	150.4	19.2	8.2	13.4	4.8	6.5	27.7	5.6	6.8	242.8
2015	154.0	19.0	8.5	18.0	6.3	7.2	31.1	10.5	6.7	261.4
2020	155.6	18.8	8.8	22.8	7.4	7.9	33.9	13.2	6.6	274.9

Source: FAA Aerospace Forecasts, Fiscal Years 2007-2020.

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

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

Regionals/Commuters – This group's operating strategy focuses around providing feeder traffic through code-sharing arrangements with mainline airlines. Some, like newly launched ExpressJet, are attempting point-to-point service in competition with the large carriers. Since 9/11, the regionals and commuters have benefited from the route restructuring and cost-cutting of the legacy carriers, taking over service to thinner medium-haul and long-haul markets.

Three distinct trends have occurred over the past five years that have helped shape today's U.S. commercial air carrier industry: (1) major restructuring and downsizing among mainline network carriers; (2) rapid growth among low-cost carriers, particularly in non-traditional long-distance transcontinental markets; and (3) exceptional growth among regional carriers.

After two consecutive years of strong growth in 2004 and 2005, U.S. commercial air carrier system capacity and traffic (domestic and international service) grew at much slower rates in 2006. System capacity, as measured in available seat miles (ASMs), was down 0.2 percent, while system RPMs and enplanements showed gains of 2.1 and 0.4 percent, respectively. At the end of 2006, commercial air carrier enplanements exceeded pre-9/11 levels by 6.2 percent, while RPMs were 13.9 percent higher than in 2000.

Regional air carriers have benefited from capacity cuts and corporate restructuring made by mainline carriers since 2000. Regional carriers have more than doubled revenue passengers, growing from 82.8 million in 2000 to 156.8 million in 2006. This represented an average annual growth rate of 11.2 percent. Regional carriers are forecast to grow at 3.1 percent annually through 2020.

Capacity and demand growth are forecast in 2007 to rebound from the slowdown in 2006. Capacity is projected to grow 2.8 percent as the mainline carrier domestic market capacity stabilizes (after falling almost six percent in 2006), while low-cost carriers continue to add capacity in domestic markets and legacy carriers continue to grow in international markets. Legacy carrier capacity is projected to increase 2.8 percent, while regional carrier capacity rises 3.0 percent.

Passenger demand growth also rebounds, with RPMs forecast to increase 3.4 percent as passenger enplanements rise 3.7 percent. Growth is projected to accelerate in 2008 as RPMs and enplanements increase 4.2 and 3.4 percent, respectively, while capacity increases slightly faster at 4.3 percent. For the balance of the forecast, system capacity is projected to increase an average of 4.4 percent. System-wide RPMs are projected to grow 4.5 percent per year, with regional carriers (5.1 percent) growing faster than mainline carriers (4.4 percent). System passengers are projected to increase an average of 3.5 percent annually, with mainline carriers growing faster than regional carriers (3.7 vs. 3.0 percent a year). The national enplanement history and projections for mainline and regional carriers are depicted on **Exhibit 2B**.

While mainline carriers have been reducing the size of aircraft flown domestically, regional carriers have been increasing the size of their aircraft. The most visible example of this trend is the great number of 70-90 seat regional aircraft that are entering the fleet and the on-going retrofitting of existing regional jets to add seats. The addition of these larger-capacity aircraft is reflected in the FAA forecast, as regional carriers move from an average of 50 seats in 2006, to 59 seats in 2020. This changing aircraft fleet is narrowing the gap between the size of aircraft operated by the mainline and regional carriers.

By 2020, aircraft are forecast to become fuller as load factors increase from the record high of 78.8 percent in 2006, to 80.3 percent. Passenger trip length is also forecast to increase, which reflects the faster growth in the relatively longer international trips and longer domestic trips resulting from increased point-to-point service, especially by low-cost regional carriers.

The number of passenger jets in the mainline carrier fleet fell by 39 aircraft in 2006, but is expected to increase by 92 aircraft in 2007 and 108 aircraft in 2008. Over the remaining 12 years of the FAA forecast, the mainline passenger fleet increases by an average of 163 aircraft per year, reaching a total of 6,041 aircraft in 2020. The narrow-body fleet (including the Embraer-190 at JetBlue and U.S. Airways) is projected to grow by 123 aircraft annually over the forecast period; the wide-body fleet grows by 31 aircraft per year, as the Boeing 787 and Airbus 350 enter the fleet.

The regional aircraft fleet has been transitioning away from turboprop aircraft to jet aircraft over the past decade. From 2000 to 2006, the number of regional jets has grown nearly 20 percent annually, from 570 in 2000, to 1,687 in 2006. Over the same period, non-jet regional aircraft have decreased 7.7 percent, from 1,704 to 1,056. This trend toward regional jets is expected to continue through 2020 with the addition of 1,002 jets and the loss of 51 non-jet regional aircraft. This represents a 7.7 percent average annual growth rate for regional jets. Turboprop aircraft will account for just over 27 percent of the regional fleet in 2020, down from a 38.5 percent share in 2006.

AIRPORT SERVICE AREA

The service area of an airport is typically defined by the proximity of other airports providing a similar level of service. 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 Lake Havasu City Municipal Airport is to serve general aviation and commercial airline demand. Although commercial passenger airline service is not currently provided at the airport, it has provided services in the recent past. Moreover, the City is partnered with other local agencies to regain commercial passenger airline service in the future.

As in any business enterprise, the more attractive the facility is in ser-

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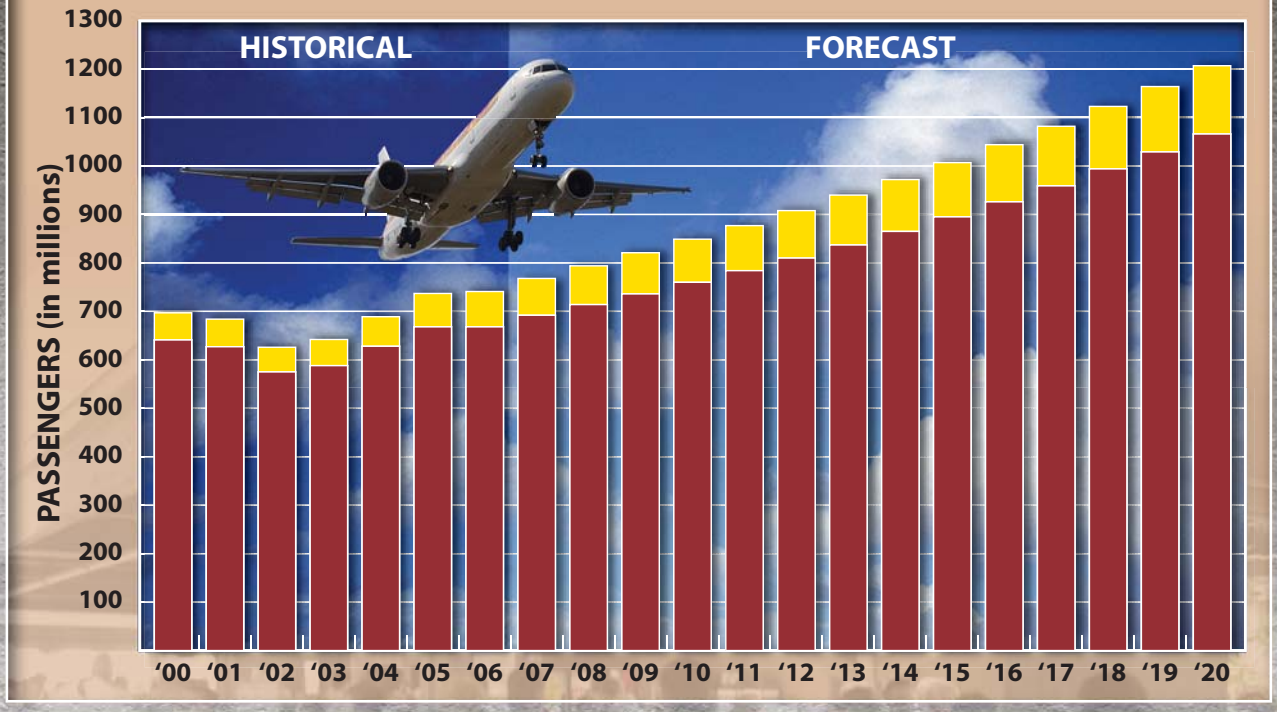
U.S. SCHEDULED COMMERCIAL AIR CARRIER PASSENGER ENPLANEMENTS

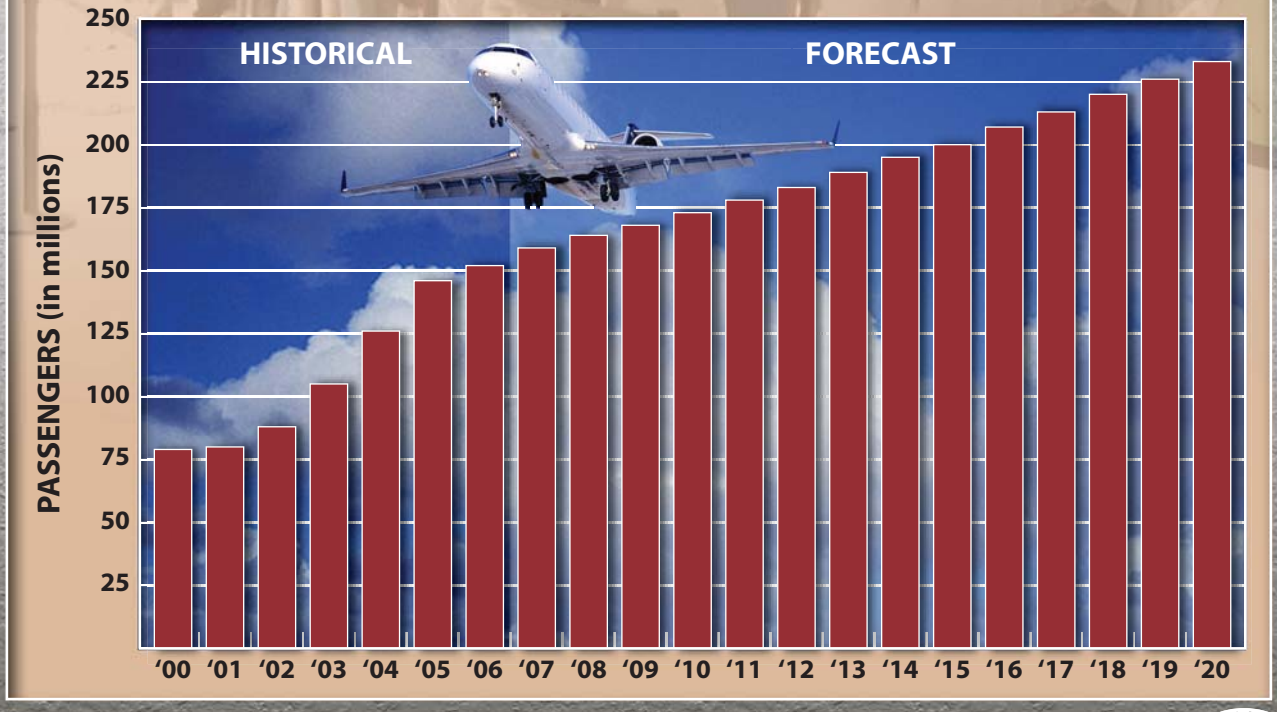


Source: FAA Aerospace Forecasts, FY 2007-2020

Domestic

International

U.S. REGIONAL/COMMUTER SCHEDULED PASSENGER ENPLANEMENTS



Source: FAA Aerospace Forecasts, FY 2007-2020

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Exhibit 2B
U.S. COMMERCIAL AIR CARRIER AND
REGIONAL/COMMUTER FORECASTS

vices 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 Lake Havasu City Municipal Airport, some level of aviation activity might be attracted to the airport from surrounding areas.

Lake Havasu City Municipal Airport is one of five public use airports in Mohave County. Of these five airports, Lake Havasu City Municipal, Laughlin/Bullhead International, and Kingman serve as commercial service airports. Mohave County is geographically the second largest in Arizona, encompassing the northwest part of the state. The county is known for its water activities with the Colorado River, Lake Havasu, and Lake Mohave providing over 1,000 miles of shoreline. Much of the county has land dedicated to the U.S. Forest Service and Bureau of Land Management. Smaller portions are also owned by Indian reservations and the State of Arizona. Approximately 20 miles to the south of Lake Havasu City is La Paz County.

Lake Havasu City is one of four incorporated communities in Mohave County. According to the 2006 Arizona Department of Economic Security population estimates, the four incorporated cities support 64 percent of the county's population. The other 36 percent live in unincorporated areas, such as Indian reservations. Lake Havasu City accounts for approximately 28 percent of the total population within the county and is the largest incorporated city, with a population of 55,338.

Laughlin/Bullhead International Airport is located 37 nautical miles (nm) north of Lake Havasu City and serves approximately 89,000 passengers in 2006. Sun Country Airlines and Allegiant Airlines operate scheduled and unscheduled charter service to and from the airport using Boeing 737 and MD-80 aircraft. The local casinos attract a large number of tourists each year to this area.

Kingman Airport is 46 nm northeast of Lake Havasu City. According to available FAA records, the airport recorded approximately 1,900 enplanements in 2005. Mesa Airlines operates under contract with US Airways to provide service to Phoenix and Las Vegas with Beech 1900 aircraft.

McCarran International Airport in Las Vegas and Phoenix Sky Harbor International Airport offer significant competition for local commercial passengers. Located approximately 150 miles (by road) northwest, McCarran International Airport is served by all major airlines and many regional air carriers. Phoenix Sky Harbor International Airport, located approximately 200 miles (by road) southeast of Lake Havasu City, is also a choice for many air travelers since it is served by the major airlines. Moreover, both airports are served by low cost airlines.

With scheduled air service available at Laughlin/Bullhead International Airport and Kingman Airport in Mohave County, the service area for Lake Havasu City Municipal Airport is limited. In addition, Las Vegas and Phoenix are both within 200 miles of Lake Havasu City and draw air travelers from

all areas of the county. Considering these factors, the primary catchment area for passenger enplanements at Lake Havasu City Municipal Airport is limited to Lake Havasu City and other communities in southern Mohave County.

From a commercial service perspective, the decision to fly out of Lake Havasu City Municipal Airport will be affected by numerous factors, including the drive times to McCarran International Airport and Phoenix Sky Harbor International Airport, the availability of flights, aircraft types, airfares offered, 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, who typically seeks low fares.

The primary attraction for commercial air service at Lake Havasu City Municipal Airport is the ground distance required to reach McCarran International Airport and Phoenix Sky Harbor International Airport. Local services provided at Lake Havasu City Municipal Airport can provide significant time savings which, in turn, provides cost savings for business travelers. Due to the limited size of the potential passenger market in Lake Havasu City, it is unlikely that the Lake Havasu City Municipal Airport could offer similar availability of flights, aircraft, or airfares for air travelers to/from Lake Havasu City as compared to McCarran International Airport or Phoenix Sky Harbor International Airport.

There will continue to be air travelers using the hub airports in Las Vegas and Phoenix rather than flying directly from Lake Havasu City. As previously discussed, this competition as well as the commercial passenger services provided at Laughlin/Bullhead International Airport and Kingman Airport limits the commercial service area of the airport to Lake Havasu City and immediate surrounding area.

The general aviation service area is more closely defined around the airport, as there are other public general aviation airports in fairly close proximity. A description of nearby general aviation airports within a 40 nm radius of Lake Havasu City Municipal Airport was presented in Chapter One – Inventory. Due to the comparable levels of facilities and services, it can be expected that the majority of general aviation demand for Lake Havasu City Municipal Airport will come from areas within and just outside of the surrounding community.

SOCIOECONOMIC TRENDS

Local and regional forecasts developed for key socioeconomic variables provide an indicator of the potential for creating growth in aviation activities at an airport. Three variables typically useful in evaluating potential for aviation growth are population, employment, and per capita personal income (PCPI).

POPULATION

Table 2D summarizes historical and forecast population estimates for Lake Havasu City and Mohave County. Historical population growth has been very strong for the city and county since 1980, averaging 4.91 percent and 4.92 percent annual average growth rate (AAGR), respectively. Lake Havasu City has averaged approximately 27 percent of the county's overall population during this same time period.

Based upon the forecast population estimates, the city population is expected to grow slightly faster than the county population during the next 20 years. A 2.78 percent AAGR is forecast for Lake Havasu City, while Mohave County is expected to grow at 2.35 percent annually.

TABLE 2D
Population Statistics
Lake Havasu City and Mohave County

Year	Lake Havasu City	Mohave County	City % of County
Historical			
1980	15,909	55,865	28.48%
1990	24,363	93,497	26.06%
2000	41,045	155,157	26.45%
2001	41,938	161,840	25.91%
2002	44,200	166,460	26.55%
2003	46,400	172,295	26.93%
2004	48,730	180,150	27.05%
2005	53,204	188,035	28.29%
2006	55,338	194,920	28.39%
Forecast			
2012	69,516	234,196	29.68%
2017	80,107	264,600	30.27%
2022	89,813	292,462	30.71%
2027	98,445	317,239	31.03%

Source: Arizona Department of Economic Security; U.S. Census Bureau

EMPLOYMENT

Historical and forecast employment data for the city and county is presented in **Table 2E**. Similar to population, the city and county's historical employment figures have grown at a strong rate since 1990. The city's employment base has grown 4.45 percent annually, while the county has seen a 4.22 percent AAGR during the same time period. Mohave County is expected to experience positive employment growth at an average annual rate of 2.38 percent through 2027. Future employment estimates for Lake Havasu City were unavailable at the time of this study.

TABLE 2E
Employment Statistics
Lake Havasu City and Mohave County

Year	Lake Havasu City	Mohave County
Historical		
1990	12,149	37,260
1995	16,420	44,290
2000	17,928	54,640
2001	18,882	56,500
2002	19,736	58,760
2003	21,240	62,530
2004	22,073	65,480
2005	22,902	69,930
2006	24,375	72,140
Forecast		
2012	N/A	85,380
2017	N/A	96,228
2022	N/A	107,237
2027	N/A	118,264

Source: Arizona Department of Economic Security; Woods and Poole CEDDS 2007; Forecast Employment for Lake Havasu City was unavailable

PER CAPITA PERSONAL INCOME

Table 2F provides historical and forecast per capita personal income (PCPI), adjusted to 2004 dollars, for Mohave County. From 1990 to 2006, PCPI for the county showed minimal growth. Through 2027, Mohave County is projected to experience moderate gains in PCPI compared to the previous years.

TABLE 2F
Per Capita Personal Income Statistics
Mohave County

Year	Per Capita Personal Income ($2004)
Historical	
1990	$20,005
1995	$17,870
2000	$20,168
2001	$20,492
2002	$20,437
2003	$20,476
2004	$21,066
2005	$21,438
2006	$21,391
Forecast	
2012	$23,045
2017	$24,696
2022	$26,554
2027	$28,627

Source: Woods and Poole CEDDS 2007

AVIATION ACTIVITY FORECASTS

The following forecast analysis examines each of the aviation-demand categories expected at Lake Havasu City Municipal 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 2027.

The need for airport facilities at Lake Havasu City Municipal 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:

GENERAL AVIATION
- Based Aircraft
- Based Aircraft Fleet Mix
- Local and Itinerant Operations
- Peak Activity
- Annual Instrument Approaches

COMMERCIAL SERVICE
- Annual Enplaned Passengers
- Airline Fleet Mix and Operations
- Peak Activity
- Annual Instrument Approaches

AIR TAXI and MILITARY
- Annual Operations

FORECASTING APPROACH

The development of aviation forecasts proceeds through both analytical and judgmental processes. A series of mathematical relationships is tested to establish statistical logic and rationale for projected growth. However, the judgment of the forecast analyst, based upon professional experience, knowledge of the aviation industry, and assessment of the local situation, is important in the final determination of the preferred forecast.

The most reliable approach to estimating aviation demand is through the utilization of more than one analytical technique. Methodologies frequently considered include market share analysis, trend line projections, and regression analysis. Comparative analysis considering other projections completed by the FAA and state/regional resources is also factored.

GENERAL AVIATION FORECASTS

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 other general aviation activities and demands can be projected.

Determining the number of based aircraft at an airport can be a challenging task. With the transient nature of aircraft storage, it can be hard to arrive at an exact number of based aircraft, as the total can change rapidly. The aircraft owner's residence may not play a major role in the based aircraft numbers, which is the case at Lake Havasu City Municipal Airport. Aircraft basing characteristics are somewhat unusual due to tourism and the seasonal climate of the area. It was determined that 57 percent of based aircraft owners have a Lake Havasu City residence or business address, 25 percent have a California address, and five percent have an address in other areas of Arizona, primarily the Phoenix metropolitan area. The remaining 13 percent of based aircraft owners have addresses in other states including Colorado, Nevada, New Mexico, and Washington.

As indicated in **Table 2G**, based aircraft numbers at Lake Havasu City Municipal Airport did grow 1.76 percent annually from 2000 to 2005, increasing from 218 to 242 aircraft. There was a slight decline in the based aircraft number for 2006. As previously mentioned, these numbers can fluctuate with factors such as tourism and seasonal climates affecting the activity in the region. According to airport management, there is a larger number of based aircraft during the summer and winter months at Lake Havasu. As a result, the time of year that based aircraft inventories are taken can play a significant role in the number of based aircraft attributed to the airport. It can be assumed that based aircraft numbers for 2006 more closely resemble the 2005 based aircraft count during the summer and winter months.

Future based aircraft at Lake Havasu City Municipal Airport will depend on several factors, including the economy, available airport facilities, and competing airports. Forecasts assume a reasonably stable and growing economy and reasonable development of airport facilities necessary to accommodate aviation demand. Competing airports will play a role in deciding regional demand shifts; however, Lake Havasu City Municipal Airport will fare well in this competition.

Market Share of Registered Aircraft

The first method used to project based aircraft examined the Lake Havasu City Municipal Airport share of registered aircraft in Mohave County. As shown in **Table 2G**, the airport captured approximately 42 percent of aircraft registered in the county in 2006. Previous years averaged approximately 50 percent of registered aircraft in the county.

TABLE 2G
Market Share of Registered Aircraft (Mohave County)
Lake Havasu City Municipal Airport

Year	Based Aircraft	Mohave County Registered Aircraft	Market Share of Registered Aircraft
1995	181	381	47.51%
2000	218	428	50.93%
2001	238	429	55.48%
2002	226	433	52.19%
2003	230	466	49.36%
2004	240	480	50.00%
2005	242	524	46.18%
2006	229	538	42.57%
Constant Market Share			
2012	251	558	45%
2017	275	612	45%
2022	303	674	45%
2027	333	741	45%
Increasing Market Share			
2012	257	558	46%
2017	294	612	48%
2022	337	674	50%
2027	385	741	52%

Source: Based Aircraft - Airport Records, FAA TAF, Cost Recovery Analysis Study; Registered Aircraft - U.S. Census of Civil Aircraft; Forecast Registered Aircraft - SANS 2000 (2022 and 2027 extrapolated); Coffman Associates analysis

Forecasts for registered aircraft growth in Mohave County were prepared for the *2000 State Aviation Needs Study* (SANS). The 2000 SANS projected Mohave County registered aircraft to grow to 649 aircraft by 2020. For purposes of this analysis, the registered aircraft forecast was extrapolated for years 2022 and 2027. Forecasts of based aircraft were developed by projecting the Lake Havasu City Municipal Airport's share of registered aircraft through 2027. The first forecast assumes a constant market share of the previous four years' average market share of registered aircraft. This yields 333 aircraft by 2027. The second projection assumes the airport's market share will increase throughout the planning period, approaching shares captured by the airport in 2001 and 2002. This projection would yield 385 based aircraft by the year 2027.

Market Share of U.S. Fleet

Based aircraft were also examined as a percentage of U.S. active general aviation aircraft. In 1995, based aircraft at Lake Havasu City Municipal

Airport represented 0.0962 percent of U.S. active general aviation aircraft. The airport's market share increased to 0.1125 percent in 2001, and then decreased to an average of 0.1084 percent over the next four years. In 2006, the market share decreased again to 0.1000 percent.

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 0.1000 percent through the planning period, which yields 303 based aircraft by the year 2027. The second forecast assumes the airport's market share will increase, as it was doing in the late 1990s and early 2000s. This increasing market share projection yields 333 based aircraft by 2027. These market share projections are presented in **Table 2H**.

TABLE 2H
Market Share of U.S. Active General Aviation Aircraft
Lake Havasu City Municipal Airport

Year	Based Aircraft	U.S Active General Aviation Aircraft	% of U.S. Active General Aviation Aircraft
1995	181	188,089	0.0962%
2000	218	217,533	0.1002%
2001	238	211,535	0.1125%
2002	226	211,345	0.1069%
2003	230	209,788	0.1096%
2004	240	219,426	0.1094%
2005	242	224,352	0.1079%
2006	229	226,422	0.1000%
Constant Market Share			
2012	251	250,587	0.1000%
2017	267	267,470	0.1000%
2022	283	282,642	0.1000%
2027	303	302,926	0.1000%
Increasing Market Share			
2012	252	250,587	0.1005%
2017	278	267,470	0.1040%
2022	302	282,642	0.1070%
2027	333	302,926	0.1100%

Source: Based Aircraft - Airport Records, FAA TAF, Cost Recovery Analysis Study; Active GA Aircraft - FAA Aerospace Forecasts Fiscal Years 2007-2020 (2022 and 2027 extrapolated); Coffman Associates analysis

Ratio of City Population

Trends comparing the number of based aircraft with the Lake Havasu City population were also analyzed. **Table 2J** presents the based aircraft per 1,000 residents in Lake Havasu City. A decreasing ratio of based aircraft per 1,000 residents projection results in population increasing at a greater rate than based aircraft, which follows the trend at the airport in re-

cent years. This is not uncommon in areas where strong population growth is occurring, which is the case at Lake Havasu City. This results in 354 based aircraft by 2027. The constant ratio of based aircraft per 1,000 residents projection results in based aircraft growing at the same rate as the local population. This yields 394 based aircraft by 2027.

TABLE 2J
Based Aircraft per Lake Havasu City Population
Lake Havasu City Municipal Airport

Year	Based Aircraft	Lake Havasu City Population	Aircraft per 1,000 Residents
1995	181	33,203	5.45
2000	218	41,045	5.31
2001	238	41,938	5.68
2002	226	44,200	5.11
2003	230	46,400	4.96
2004	240	48,730	4.93
2005	242	53,204	4.55
2006	229	55,338	4.00
Decreasing Ratio Projection			
2012	271	69,516	3.90
2017	304	80,107	3.80
2022	332	89,813	3.70
2027	354	98,445	3.60
Constant Ratio Projection			
2012	278	69,516	4.00
2017	320	80,107	4.00
2022	359	89,813	4.00
2027	394	98,445	4.00

Source: Based Aircraft - Airport Records, FAA TAF, Cost Recovery Analysis Study; Population - Arizona Department of Economic Security; Coffman Associates analysis

Comparative Forecasts

A Limited Master Plan Update completed in 1999 also contains projections of based aircraft. Interpolating the study, based aircraft projections yield 281 aircraft in 2012. Extrapolation of the trend results for years 2017, 2022, and 2027 result in 302, 326, and 351 based aircraft, respectively. This equates to a 1.49 percent average annual growth rate (AAGR).

The 2000 SANS also contains projections of based aircraft. Interpolation results in 235 based aircraft in 2012 and 260 based aircraft in 2017. Extrapolation of the trend yields 289 aircraft in 2022 and 319 aircraft in 2027. This represents a 2.06 percent AAGR.

It should be mentioned that the FAA TAF also contains projections of based aircraft for Lake Havasu City Municipal Airport. Starting in 2005, the TAF

projected 379 based aircraft through the planning period. The number of current based aircraft at the airport is actually much lower than this number.

Statistical Trends and Regression

Regression analysis was also conducted on the data sets. It is optimal to have an "r^2" value near or above 0.90, which would represent a very strong correlation. The results of the regression analysis did not provide values near the 0.90 indicator. This can be directly attributed to the fluctuating nature of based aircraft since 2000, while population, employment, and other socioeconomic factors were increasing. As a result, this type of analysis was not considered reasonable for forecasting purposes.

Based Aircraft Summary

Deciding which forecast or combination of forecasts to use to arrive at a final based aircraft forecast involves more than just statistical analysis. Consideration must be given to the current and future aviation conditions at the airport in the short term. For example, it is known that Lake Havasu City Municipal Airport has a large "waiting list" for hangar space on the airport. If the airport were to have more hangars constructed, it can be assumed that it would have little difficulty occupying the hangars, and thus increasing its based aircraft numbers.

Experience indicates that when new hangars are constructed, those who rent the space are not always new based aircraft. Some of them will be aircraft owners who have used tiedowns or other facilities at the airport. Typically, a new hangar facility will attract up to 75 percent new based aircraft. Also, approximately 50-75 percent of those on the waiting list will actually sign a lease when the opportunity becomes available.

In addition, since the last Master Plan, Lake Havasu City Municipal Airport has improved in a manner to be more attractive to aircraft owners, especially those who own corporate jets. A 2,500-foot runway extension has been added to accommodate larger jets. A second major fixed base operation (FBO) has also been established on the airport that brought hangar storage space and aircraft services.

As previously discussed, tourism and seasonal climate play an important role in the number of based aircraft at Lake Havasu City Municipal Airport. Although several aircraft do not base at the airport in the traditional sense, these aircraft lease tiedowns and hangar facilities on the airport and constitute a demand level for a certain time period during the year.

Table 2L and **Exhibit 2C** provide a summary of all general aviation based aircraft forecasts previously discussed. Lake Havasu City has made a concerted and successful effort to position the airport to accept growth. The market share of U.S. active general aviation aircraft and SANS 2000 forecasts are low considering the historical growth of the airport and additional hangar facilities currently being con-

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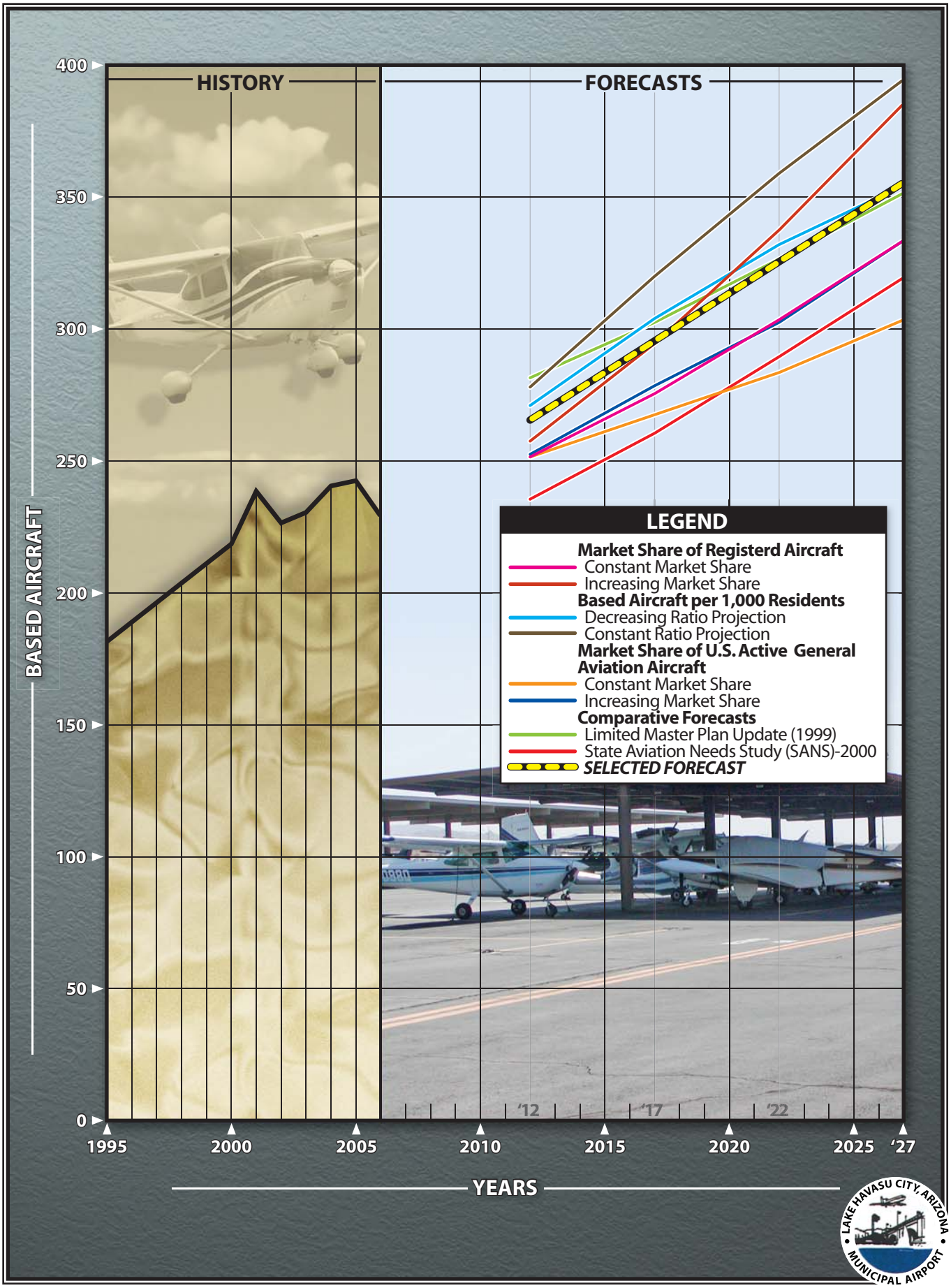

Exhibit 2C
BASED AIRCRAFT FORECASTS

structed that will only help to further expand the airport's potential. The selected planning forecast is closely related to the mid-range of the market share of registered aircraft forecast and the decreasing ratio projection of based aircraft per 1,000 residents forecast. It also is similar to the 1999 Limited Master Plan Update forecast. It accounts for the historical growth trend at the airport, and increases this growth over the planning period to account for current hangar development under construction and other areas of the airport that are primed for development already served by taxiway access. The planning forecast projects based aircraft growing at an average annual rate of 1.85 percent through the planning period.

TABLE 2L
Based Aircraft Forecasts Summary
Lake Havasu City Municipal Airport

Projections	**2012**	**2017**	**2022**	**2027**
Market Share of Registered Aircraft (Mohave County)				
Constant Market Share	251	275	303	333
Increasing Market Share	257	294	337	385
Based Aircraft per 1,000 Residents (Lake Havasu City)				
Decreasing Ratio Projection	271	304	332	354
Constant Ratio Projection	278	320	354	394
Market Share of U.S. Active General Aviation Aircraft				
Constant Market Share	251	267	283	303
Increasing Market Share	252	278	302	333
Comparative Forecasts				
Limited Master Plan Update (1999)	281*	302**	326**	351**
State Aviation Needs Study (SANS) 2000	235*	260*	289**	319**
Selected Forecast	***265***	***295***	***325***	***355***

* Interpolated; ** Extrapolated

BASED AIRCRAFT FLEET MIX

The based aircraft fleet mix at Lake Havasu City Municipal Airport is presented in **Table 2M**. The forecast fleet mix utilizes existing local trends as well as forecast U.S. general aviation trends as presented in *FAA Aerospace Forecasts – Fiscal Year 2007-2020*. The FAA projects that business jets will be the fastest growing general aviation aircraft type in the future. The number of business jets in the U.S. fleet is expected to more than double through 2020 and triple in size in 20 years. This represents an annual growth rate of 6.0 percent. Helicopters are also projected to show a strong growth rate of 3.6 percent annually through this time period. Turboprop and single engine piston powered aircraft are projected to grow, but at a much slower pace. Multi-engine aircraft are the only category expected to decrease in number through 2020.

TABLE 2M
Based Aircraft Fleet Mix
Lake Havasu City Municipal Airport

	Current	%	2012	%	2017	%	2022	%	2027	%
Single Engine Piston	169	73.8%	202	76.2%	228	77.3%	255	78.5%	279	78.6%
Multi-Engine Piston	34	14.8%	34	12.8%	35	11.9%	35	10.8%	36	10.1%
Turboprop	9	3.9%	11	4.2%	12	4.1%	13	4.0%	15	4.2%
Jet	9	3.9%	10	3.8%	11	3.7%	12	3.7%	14	3.9%
Helicopter	6	2.6%	6	2.3%	7	2.4%	8	2.5%	9	2.5%
Ultralight	2	0.9%	2	0.8%	2	0.7%	2	0.65	2	0.6%
Totals	**229**	**100.0%**	**265**	**100.0%**	**295**	**100.0%**	**325**	**100.0%**	**355**	**100.0%**
U.S Active Aircraft (FAA Aerospace Forecasts 2006 Estimated)										
Single Engine Piston	173,177	76.5%	188,737	75.3%	199,099	74.4%	206,686	73.1%	214,562	71.6%
Multi-Engine Piston	19,364	8.6%	19,101	7.6%	18,916	7.1%	18,678	6.6%	18,444	6.2%
Turboprop	8,026	3.5%	8,352	3.3%	8,605	3.2%	8,946	3.2%	9,301	3.1%
Jet	10,032	4.4%	15,304	6.1%	19,881	7.4%	25,377	9.0%	32,393	10.8%
Helicopter	9,232	4.1%	12,308	4.9%	14,272	5.3%	16,271	5.8%	18,551	6.2%
Other	6,592	2.9%	6,785	2.7%	6,698	2.5%	6,606	2.3%	6,515	2.2%
Totals	**226,423**	**100.0%**	**250,587**	**100.0%**	**267,471**	**100.0%**	**282,564**	**100.0%**	**299,766**	**100.0%**

Note: Experimental and Sport Aircraft totals are included in Single Engine Piston category; 2022 and 2027 U.S. Active Aircraft projections extrapolated

Source: Airport records; FAA Aerospace Forecasts FY 2007-2020

The fleet mix at Lake Havasu City Municipal Airport is expected to see growth similar in make-up to that on the national level. The single engine piston category is projected to increase only slightly as a percentage of total based aircraft; however, it is projected to continue to dominate the based aircraft fleet mix, growing by 110 aircraft. The number of multi-engine piston aircraft is forecast to increase to 36, although still resulting in a percentage decline. Business jets and turboprop aircraft are expected to experience significant growth. Lake Havasu City is continuing to grow in terms of population and employment. These factors add to optimism for business jet and turboprop growth at the airport. Currently, there are nine business jets and nine turboprops based at the airport. The fleet mix indicates as many as 14 jets and 15 turboprops could base at the airport by 2027. The helicopter percentage is maintained relatively constant through the planning period, allowing for some growth in this category at the airport.

ANNUAL 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. Generally, local operations are characterized by training operations. Itinerant operations are those performed by aircraft with a specific origin or destination away from the airport.

Due to the absence of an airport traffic control tower (ATCT), actual operation counts are not available for Lake Havasu City Municipal Airport. Instead, only estimates of operations are available. Historical estimates of aircraft operations are summarized in the FAA TAF. **Table 2N** summarizes historical general aviation operational estimates since 1998 for Lake Havasu City Municipal Airport.

TABLE 2N
Historical General Aviation Operations
Lake Havasu City Municipal Airport

Year	Local	Itinerant	Total
1998	23,360	24,640	48,000
2000	21,000	22,600	43,600
2002	23,360	22,600	45,960
2006	23,360	22,600	45,960

Source: FAA TAF

It should be noted that airport management monitors the airport's UNICOM frequency and has traditionally logged aircraft operations at the airport during the hours they are present. Over the past five years, airport staff has logged an annual average of 33,364 aircraft operations during approximately 4,400 working hours. Their counts include all types of aircraft operations. Total aircraft operations will be higher than what was logged by airport management monitoring the airport's UNICOM frequency due to limited hours of operation.

General aviation operations have been examined as a ratio of general aviation based aircraft. As shown in **Table 2P**, the 2006 estimate of 45,960 annual general aviation operations equates to 205 operations per based aircraft. Years 2000 and 2002 averaged approximately 200 operations per based aircraft.

Two different forecasts were conducted for general aviation operations. First, a constant number of operations per based aircraft was used to project aircraft operations. The second forecast increased the number of operations per based aircraft through the planning period. Operations per based aircraft typically range between 200 and 500 at general aviation airports. The higher operations per based aircraft are experienced at airports with higher numbers of local operations than itinerant operations. In 2006, it was estimated that local operations accounted for approximately 51 percent of total general aviation operations.

As shown in **Table 2P**, applying 210 operations per based aircraft yields 74,550 annual general aviation operations in 2027. Increasing the operations per based aircraft ratio yields 92,300 annual operations by 2027. The SANS 2000 and FAA TAF have been examined for comparative purposes. The SANS 2000 projected operations growing from 61,304 in 2005, to 83,320 in 2020. Extrapolating these numbers yield 96,000 general aviation operations by 2027. The FAA TAF projects annual operations to remain static at 46,632 through 2025.

TABLE 2P
Annual General Aviation Operations Forecasts
Lake Havasu City Municipal Airport

Year	Based Aircraft	Local Operations	% of Total	Itinerant Operations	% of Total	Total Operations	Operations Per Based Aircraft
1998	215	23,360	48.67%	24,640	51.33%	48,000	223
2000	218	21,000	48.17%	22,600	51.83%	43,600	200
2002	226	23,360	50.83%	22,600	49.17%	45,960	203
2006	229	23,360	50.83%	22,600	49.17%	45,960	205
Constant Operations Per Based Aircraft							
2012	265	28,938	52%	26,712	48%	55,650	210
2017	295	34,073	55%	27,878	45%	61,950	210
2022	325	37,538	55%	30,713	45%	68,250	210
2027	355	41,003	55%	33,548	45%	74,550	210
Increasing Operations Per Based Aircraft							
2012	265	31,694	52%	29,256	48%	60,950	230
2017	295	38,940	55%	31,860	45%	70,800	240
2022	325	44,688	55%	36,563	45%	81,250	250
2027	355	50,765	55%	41,535	45%	92,300	260
Selected Planning Forecast							
2012	265	30,300	52%	28,000	48%	58,300	220
2017	295	36,500	55%	29,900	45%	66,400	225
2022	325	41,100	55%	33,700	45%	74,800	230
2027	355	46,900	55%	38,300	45%	85,200	240

Source: Based Aircraft - Airport Records, Cost Recovery Analysis Study, FAA TAF; 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 Lake Havasu City Municipal Airport. Considering these factors, along with a third fixed base operator (FBO) that is to open in 2008 providing additional flight training and other aircraft services, the selected planning forecast for the airport projects the number of operations per based aircraft to gradually increase through the planning period. The selected mid-range forecast results in 85,200 annual general aviation operations by 2027. This is an average annual growth rate of 3.1 percent. Local operations are projected to increase to 55 percent of total general aviation operations as the number of flight training activities at the airport grows. **Exhibit 2D** depicts the general aviation operations forecast.

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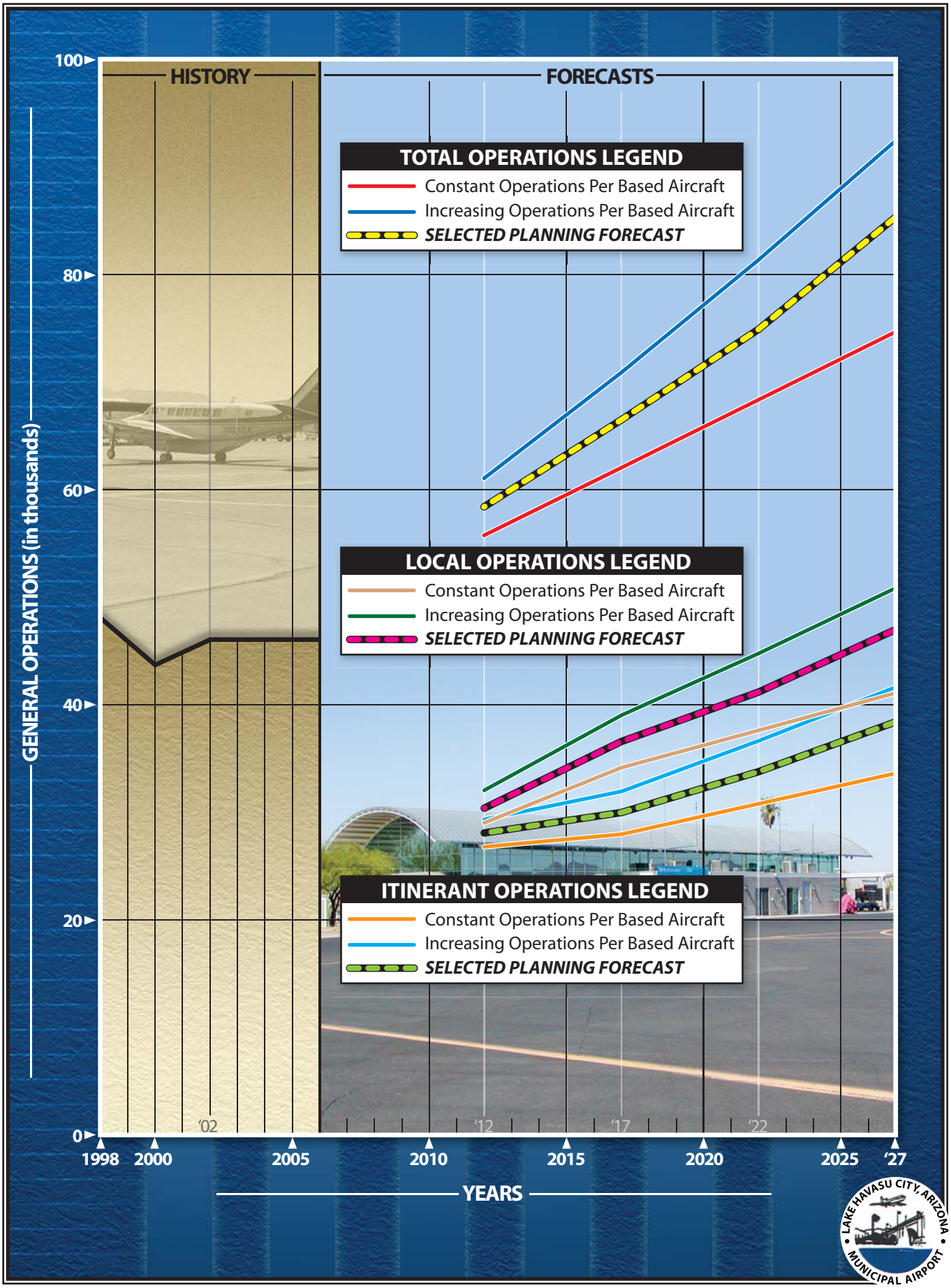

Exhibit 2D
GENERAL AVIATION
OPERATIONS FORECASTS

COMMERCIAL SERVICE FORECASTS

To determine the types and sizes of facilities necessary to properly accommodate potential 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.

LAKE HAVASU CITY MUNICIPAL AIRPORT AIR SERVICE

Mesa Airlines operating under Air Midwest had provided commercial air service to Lake Havasu City Municipal Airport until May 6, 2007, when it ceased operations. Before this time, Mesa Airlines was providing two daily non-stop flights to Phoenix Sky Harbor International Airport, Monday through Friday, as well as one daily non-stop flight to Phoenix Sky Harbor International Airport on Saturday and Sunday. Mesa Airlines utilized Beech 1900 aircraft that are configured to carry up to 19 passengers.

According to records, four separate airlines have provided passenger air service at Lake Havasu City Municipal Airport since 1998. Besides Air Midwest, which has utilized the airport during this time period, Arizona Express and Dynasty Air also provided commercial service at Lake Havasu City Municipal Airport. Their operations ceased in 2004. United Express also provided commercial service at the airport until 1999.

In May 2006, Air Midwest started providing one flight to Phoenix Sky Harbor International Airport and one flight to McCarran International Airport in Las Vegas, Sunday through Friday, as well as one flight to Las Vegas on Saturday. This flight schedule lasted until February 2007, when Air Midwest began operating exclusively to Phoenix until ceasing operations in May.

PASSENGER ENPLANEMENTS

Historical passenger enplanements since 1998 are presented in **Table 2Q**. As shown in the table, enplanements at Lake Havasu City Municipal Airport have fluctuated significantly in the past several years. Enplanements peaked at 10,761 in 2004. The lowest annual level was in 2006 with 6,085. The decline in annual enplanements in 2005 and 2006 is the result of decreased daily flights and the fact that two airlines, Arizona Express and Dynasty Air, ceased operations in 2004.

As in any case where there are differences in levels of service, Lake Havasu City Municipal Airport must compete with the air service available at McCarran International Airport and Phoenix Sky Harbor International Airport. While approximately 150 miles and 200 miles from Lake

Havasu City, 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 Lake Havasu City Municipal Airport. This is referred to as leakage. The re-capture of passenger leakage will lead to growth in enplanements at the airport.

TABLE 2Q
Passenger Enplanements per Lake Havasu City Population
Lake Havasu City Municipal Airport

Year	Enplaned Passengers	Lake Havasu City Population	Enplanements per Resident
1998	9,633	37,580	0.26
1999	9,223	38,635	0.24
2000	8,266	41,045	0.20
2001	7,427	41,938	0.18
2002	7,317	44,200	0.17
2003	9,475	46,400	0.20
2004	10,761	48,730	0.22
2005	8,618	53,204	0.16
2006	6,085	55,338	0.11
Constant Ratio Projection			
2012	9,700	69,516	0.14
2017	11,200	80,107	0.14
2022	12,600	89,813	0.14
2027	13,800	98,445	0.14
Increasing Ratio Projection			
2012	10,400	69,516	0.15
2017	13,600	80,107	0.17
2022	17,100	89,813	0.19
2027	20,700	98,445	0.21

Source: Enplaned Passengers - Airport Records; Population - Arizona Department of Economic Security; Coffman Associates Analysis

The number of potential enplanements that Lake Havasu City Municipal Airport could attract depends primarily upon the level of air service at the airport. The full potential for Lake Havasu City Municipal Airport would only be realized if the airport provided services and airfares similar to McCarran International Airport and/or Phoenix Sky Harbor International Airport. This is not likely, considering the communities that these two airports serve, and the established airline operations at the airports. As such, Lake Havasu City Municipal Airport will only be capable of attracting passengers with specific needs and desires to fly from Lake Havasu City. With this being said, the type of commercial passenger most likely to utilize the airport is the business traveler and/or recreational traveler looking to enjoy the activities Lake Havasu has to offer.

Ratio of City Population

Table 2Q examines enplanements as a ratio of Lake Havasu City's population. Lake Havasu City represents the primary catchment area for the airport's enplanements. As presented in the table, the ratio of enplanements to population has declined the past two years.

Two forecasts, based on the ratio of enplanements to population, have been prepared. A constant ratio of enplanements per resident has been developed to yield an enplanement projection growing at the same rate as the Lake Havasu City population. Applying a constant ratio of 0.14 enplanements to residents yields approximately 13,800 annual enplanements by the end of the planning period. A second forecast presents an increasing ratio of enplanements to population through the planning period, reaching a level similar to the 2003 and 2004 enplanements per resident. This results in 20,700 annual enplanements by 2027.

Market Share of U.S. Regional Enplanements

A market share analysis of total U.S. regional airline enplanements was also developed to prepare an alternative forecast. **Table 2R** delineates Lake Havasu City Municipal Airport's market share since 1998.

As shown in the table, the airport's share of the U.S. market for regional airline enplanements has varied since 1998, from a high of 0.015 percent in 1998 to a low of 0.004 percent in 2006. Similar to the airport's ratio of enplanements to residents, the Lake Havasu City Municipal Airport's share of U.S regional airline enplanements has declined since 2005.

To gain an understanding of future airline enplanements at Lake Havasu City Municipal Airport based upon the growth projected for U.S. regional airline enplanements, a constant market share has been prepared. This forecast takes a constant share of 0.005 percent and applies it to forecast U.S. regional airline enplanements prepared by the FAA. This method projects annual enplanements growing at the same rate as U.S. regional airline enplanements and yields 14,500 enplanements by the end of the planning period. A second forecast projects Lake Havasu City Municipal Airport gaining market share through the planning period. This projection yields approximately 26,900 enplanements by 2027. This projection accounts for the airport recapturing a portion of passenger leakage.

Comparative Forecasts

The 1999 Limited Master Plan Update contains projections of enplaned passengers. In 2010 and 2015, approximately 20,800 and 24,900 enplanements were forecast, respectively. Overall, this equates to a 4.48 percent average annual growth rate.

The 2000 SANS also contains projections of enplaned passengers. The SANS projected 18,308 enplanements for 2010. By 2020, the study projected

21,360 enplanements. Extrapolation of the trend yields approximately 28,200 by 2027. This represents a 4.05 percent annual growth rate.

TABLE 2R
Market Share of U.S. Regional Enplanements
Lake Havasu City Municipal Airport

Year	Enplaned Passengers	U.S. Regional Enplanements	% of U.S. Regional Airline Enplanements
1998	9,633	65,700,000	0.015%
1999	9,223	73,100,000	0.013%
2000	8,266	79,700,000	0.010%
2001	7,427	80,400,000	0.009%
2002	7,317	88,600,000	0.008%
2003	9,475	105,000,000	0.009%
2004	10,761	125,900,000	0.009%
2005	8,618	146,400,000	0.006%
2006	6,085	152,100,000	0.004%
Constant Market Share			
2012	9,200	183,500,000	0.005%
2017	10,700	213,100,000	0.005%
2022	12,400	248,200,000	0.005%
2027	14,500	289,300,000	0.005%
Increasing Market Share			
2012	11,000	183,500,000	0.006%
2017	14,900	213,100,000	0.007%
2022	19,900	248,200,000	0.008%
2027	26,000	289,300,000	0.009%

Source: Enplaned Passengers - Airport Records; U.S. Regional Enplanements - FAA Aerospace Forecasts FY 2007-2020 (2022 and 2027 extrapolated); Coffman Associates analysis

Finally, the FAA TAF presents enplanement projections for all commercial service airports in the United States. The FAA TAF for Lake Havasu City Municipal Airport was developed using historical data through the year 2005 and projects a very modest increase in annual enplanements to 9,013 by 2025. The forecasts equate to a 0.13 percent AAGR.

Statistical Trends and Regression

As previously mentioned, it is optimal to have an "r^2" value near or above 0.90, which would represent a very strong correlation when projecting future activity based on previous trends. Due to the fluctuations in enplanement levels since 1998, the time-series and regression analyses yielded correlation coefficients too low to have any predictive reliability. Therefore, none of these analyses were carried forward in this study.

Passenger Enplanement Summary

Table 2S summarizes all the projections considered for this analysis. As shown on **Exhibit 2E**, the combination of the forecasts represents a "forecast envelope." The "forecast envelope" represents the area in which future enplanements should be found.

The constant ratio projection of enplanements per Lake Havasu City residents forecast represents the low end of the forecast envelope, while the increasing market share of U.S. regional enplanements projection forms the upper end of the envelope. The FAA TAF lies below the forecast envelope and the Limited Master Plan Update is substantially above the forecast envelope.

TABLE 2S
Passenger Enplanement Forecasts Summary
Lake Havasu City Municipal Airport

Projections	2012	2017	2022	2027
Enplanements per Residents (Lake Havasu City)				
Constant Ratio Projection	9,700	11,200	12,600	13,800
Increasing Ratio Projection	10,400	13,600	17,100	20,700
Market Share of U.S. Regional Enplanements				
Constant Market Share	9,200	10,700	12,400	14,500
Increasing Market Share	11,000	14,900	19,900	26,000
Comparative Forecasts				
Limited Master Plan Update (1999)	22,300*	27,100**	33,700**	42,000**
State Aviation Needs Study (SANS) 2000	18,700*	20,200*	22,200**	24,500**
FAA Terminal Area Forecast (TAF)	8,859	8,925	8,980	9,040**
Selected Planning Forecast	***9,500***	***11,000***	***13,000***	***16,000***

* Interpolated; ** Extrapolated

In examining the forecasts, it would appear that the increasing market share of U.S. regional enplanements projection is too aggressive for the airport. This forecast yields a strong annual growth rate of 5.90 percent that more than likely could not be sustained over the planning period due to competing airports in the region. The Limited Master Plan Update and SANS 2000 forecasts also appear very high for the airport. These studies forecast current enplanement levels to be over 15,000, when in actuality, last year's enplanement level was approximately 6,000. As a result, future forecasts are much higher than what can reasonably be expected.

The constant and increasing ratio projection of enplanements per Lake Havasu City residents appear to be in line with potential enplanement growth. As shown previously, enplanements grew from 2002 to 2004 when the airport sustained continual, reliable air service. If this type of service could be achieved again, enplanement growth could grow at a mid-range level of these two forecasts.

There is potential for growth in the Lake Havasu City market. The local population and economy is growing as evidenced previously. The airport serves the Lake Havasu and Colorado River region, which attracts tourism and climates suitable for summer recreation and winter retreats. These factors are important to some business travelers and visitors.

The selected forecast for Lake Havasu City Municipal Airport closely follows the constant market share of U.S. regional enplanements. This forecast yields 9,500 annual enplanements in 2012 and increases 3.54 percent annually to approximately 16,000 annual enplanements by 2027.

AIRLINE FLEET MIX AND OPERATIONS

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 that could take place at the airport, but it is also helpful in defining many of the key parameters used in airport planning; namely, critical aircraft serving the airport (used for pavement design, ramp geometry, and terminal complex layout).

As previously mentioned, Mesa Airlines (operated under Air Midwest) utilized 19-seat Beech 1900 aircraft for its commercial service operations in the past. If the airport gains commercial service in the future, it is expected that it will continue to be provided by regional/commuter airlines. 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 37-seat Embraer Regional Jet (ERJ-135). With room for additional passengers, these aircraft offer operators a significant reduction in seat-mile operating costs, while offering many amenities that the flying public has become accustomed to such as a flight attendant and restrooms on board. In the event that enplanements were to grow, it can be expected that larger aircraft would be used at the airport to serve peak time periods.

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 BLF 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 on 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 2006, the average number of departure seats was 19, as the airport was consistently served with the Beech 1900 aircraft. The BLF at this time was 51 percent. Consistent with the national trend, the BLF is projected to increase through 2017 and then de-

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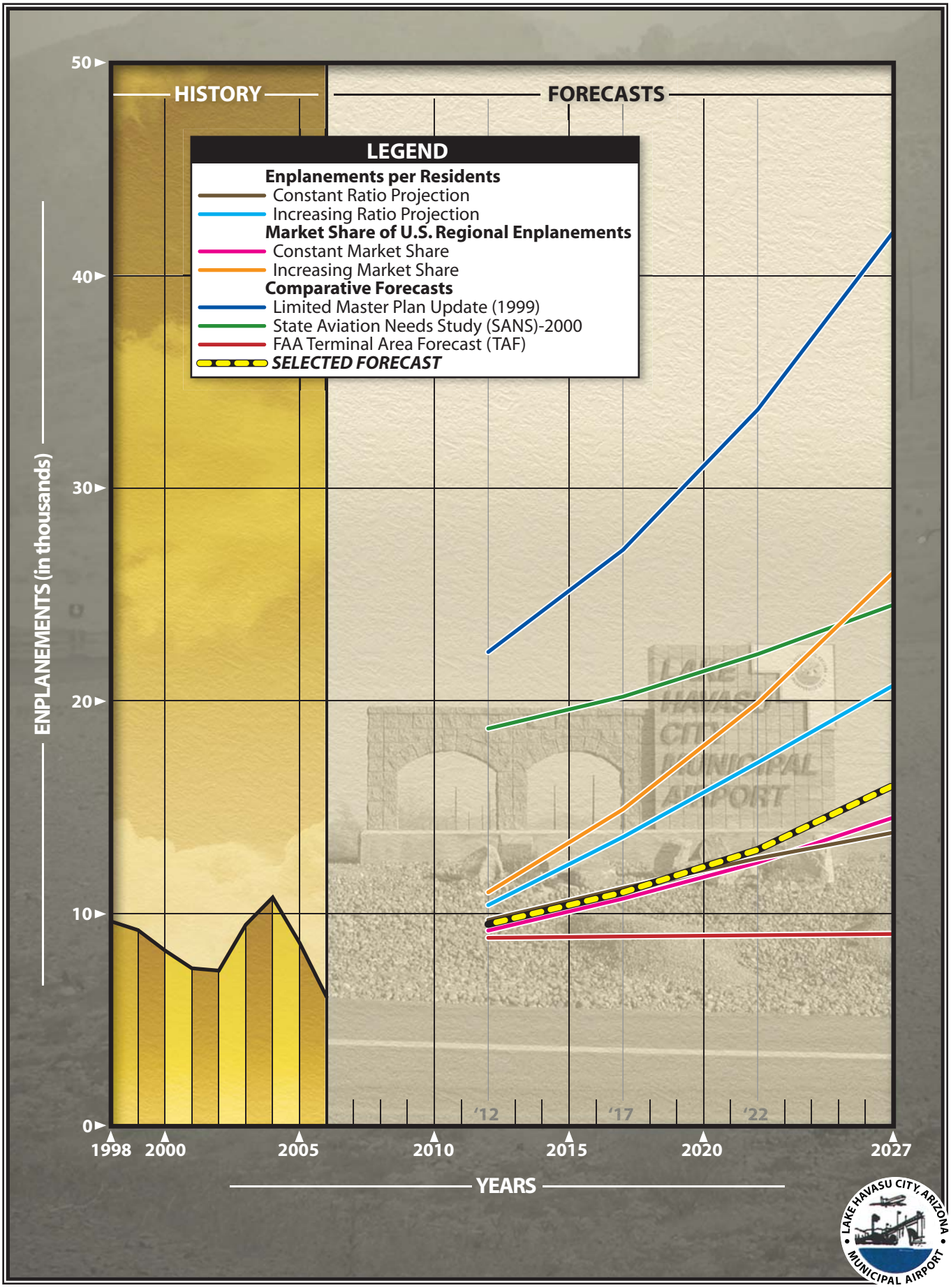

Exhibit 2E
PASSENGER ENPLANEMENT
FORECASTS

cline slightly as larger aircraft could be introduced into the market.

Annual operations are calculated by dividing the projected annual enplanements by the enplanements per departure. An increase in operations is projected through the planning period. This could be needed to serve the potential demand and accounts for schedule and frequency enhancements. **Table 2T** summarizes the fleet mix and operations forecast for Lake Havasu City Municipal Airport. As evidenced, should the airport regain commercial service, projections point toward an increase in utilization of the service in the future.

TABLE 2T
Airline Fleet Mix and Operations Forecast
Lake Havasu City Municipal Airport

Seating Range (Representative Aircraft)	2006	2012	2017	2022	2027
10-20 (Beechcraft 1900)	100%	100%	100%	80%	70%
Greater than 20 (ERJ-120, Q-100)	0%	0%	0%	20%	30%
Average Seats Per Departure	19	19	19	21	22
Boarding Load Factor	51%	58%	63%	62%	64%
Enplanements Per Departure	10	11	12	13	14
Annual Enplanements	6,085	9,500	11,000	13,000	16,000
Annual Departures	627	900	950	1,050	1,200
Annual Operations	1,254	1,800	1,900	2,100	2,400

Source: Coffman Associates analysis

AIR TAXI OPERATIONS

The air taxi category refers to those operators that are certified in accordance with Federal Aviation Regulation (F.A.R.) Part 135 and are authorized to provide on-demand, public transportation of persons and property by aircraft. Typically, air taxi operators are operating as a charter service or under a fractional-ownership program.

In the post-9/11 environment, many executives have opted to use private jets for their travel needs. Fractional-ownership programs were well positioned to meet this growing demand. There are a number of companies, including Citation Shares, NetJets, Bombardier FlexJet, and Flight Options, which provide this service. Companies or individuals are able to purchase partial ownership, typically one-sixteenth or one-eighth of an aircraft. This gives them a certain allotment of time to use an aircraft in the fractional-ownership fleet.

Analysis of air taxi operators can have a significant impact on the needs of an airport. Fractional-ownership companies utilize business jets almost exclusively. Many of these aircraft are large business jets. As larger business jets increasingly utilize the airport, the necessary design standards for the airport may change. Charter operators use a variety of piston, turboprop, and, on occasion, jet aircraft. The type

of aircraft using the airport will be a critical element for the airport to prepare for in the future.

Due to the absence of an ATCT at Lake Havasu City Municipal Airport, actual air taxi operations counts are not available. Fortunately, a subscription service (*Airport IQ*) is available that provides partial operational data. The data provided represents the absolute minimum number of operations. If a flight plan is not opened prior to takeoff and/or not closed after landing, then the operation is not credited in the data set. It is common for pilots to not file a flight plan until after departure, or to close it prior to landing, if visual flight rules (VFR) apply. VFR weather conditions are very common at Lake Havasu City Municipal Airport. As a result, air taxi operations verified by *Airport IQ* were increased 50% to better account for actual activity.

The fractional-ownership industry experienced significant growth from 1998 to 2002, when the aircraft fleet grew by 182 percent, according to *Aviation Week*. The economic slowdown in 2001 and 2002 caught up to the industry in 2003, but 2004 was another growth year. According to AvData, Inc., an independent Wichita, Kansas-based aviation research and consulting firm, fractional-ownership programs are forecast to experience continued growth of approximately 15 percent per year over the next 20 years. Other industry analysts predict the growth potential to be in the single digits.

As mentioned earlier, an entire new category of VLJs are entering the general aviation market. A number of companies are proceeding with business plans to offer on-demand air taxi service utilizing these types of aircraft. The VLJs are relatively inexpensive compared to larger cabin class business jets, and they will have access to more airports as the required runway length is much less. Lake Havasu City Municipal Airport is well positioned to attract operations by VLJs with adequate runway length and forecasted growth in business opportunities in the airport service area. For planning purposes, an increasing trend of five percent per year will be applied to operations forecast for air taxi operations. Forecast air taxi operations are presented in **Table 2U**.

TABLE 2U
Air Taxi Operations Forecasts
Lake Havasu City
Municipal Airport

Year	Air Taxi Operations
2006	1,600
2012	2,100
2017	2,700
2022	3,500
2027	4,400

Source: Airport IQ; Coffman Associates analysis

MILITARY OPERATIONS

Military activity accounts for the smallest portion of operational traffic at Lake Havasu City Municipal Airport. Since 2000, military operations have accounted for 360 annual itinerant operations according to the FAA TAF. There have been no local military operations. Due to the unpredictable nature of military operations,

a constant of 400 total operations annually will be utilized in forecasting. This is consistent with typical industry practices for projecting military operations.

PEAKING CHARACTERISTICS

Many airport facility needs are related to the levels of activity during peak periods (busy times). The periods used in developing facility requirements for this study are as follows:

- **Peak Month** – The calendar month when peak passenger enplanements or aircraft operations occur.
- **Design Day** – The average day in the peak month. This indicator is derived by dividing the peak month operations or passenger enplanements by the number of days in the month.
- **Busy Day** – The busy day of a typical week in the peak month.
- **Design Hour** – The peak hour within the design day.

AIRLINE PEAKING CHARACTERISTICS

Airline peaking characteristics have been determined by examining historical records of enplanements and operations. The average peak month for passenger enplanements since 1998 was 10.7 percent of total enplanements. Future peak month levels were estimated using this percentage. 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 average peak month for airline operations since 1998 captured approximately 11.5 percent of annual operations. This percentage was applied to forecast operations. In 2006, the airport had two daily departures, or four total operations. This represents the design day. The design hour had one departure and landing operation, for two total operations. Average day and peak hour operations are projected to increase later in the planning period as additional daily flights could be added. A summary of the forecasts for peak period airline enplanements and operations is presented in **Table 2V**.

TABLE 2V
Peak Period Forecasts
Lake Havasu City Municipal Airport

	2006	2012	2017	2022	2027
Airline Enplanements					
Annual	6,085	9,500	11,000	13,000	16,000
Peak Month	780	1,017	1,177	1,391	1,712
Design Day	26	34	39	46	57
Design Hour	10	17	22	27	34
Airline Operations					
Annual	1,254	1,800	1,900	2,100	2,400
Peak Month	128	207	219	241	276
Design Day	4	4	6	8	10
Design Hour	2	2	2	2	4
General Aviation Operations					
Annual	47,920	60,800	69,500	78,700	90,000
Peak Month	5,750	7,296	8,340	9,444	10,800
Design Day	192	243	278	314	360
Busy Day	240	303	348	392	450
Design Hour	29	36	42	47	54

Source: Coffman Associates analysis

GENERAL AVIATION PEAKING CHARACTERISTICS

Without an ATCT, 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 2006.

Typically, the peak month for activity at general aviation airports approximates 10 to 15 percent of the airport's annual operations. For planning purposes, peak month operations have been estimated at 12 percent of annual operations at Lake Havasu City Municipal Airport. The design day operations were calculated by dividing the peak month by 30. The design day is primarily used in airfield capacity calculations.

The busy day provides information for use in determining aircraft parking apron requirements. The busiest day of each week accounts for approximately 18 percent of weekly operations. Thus, to determine the typical busy day, the design day is multiplied by 1.25, which represents approximately 18 percent of the days in a week. Design hour operations were determined at 15 percent of the design day operations. **Table 2V** summarizes peak general aviation operations forecasts for the airport.

ANNUAL INSTRUMENT APPROACHES

An instrument approach, as defined by the FAA, is "an approach to an airport with the intent to land by an aircraft in accordance with an Instrument Flight Rule (IFR) flight plan, when visibility is less than three miles and/or when the ceiling is at or below the minimum initial approach altitude." To qualify as an instrument approach at Lake Havasu City Municipal Airport, aircraft must land at the airport after following one of the published instrument approach procedures and then properly close their flight plan on the ground. The approach must be conducted in weather conditions which necessitate the use of the instrument approach. If the flight plan is closed prior to landing, then the instrument approach is not counted in the records. Forecasts of annual instrument approaches (AIAs) provide guidance in determining an airport's requirements for navigational aid facilities. It should be noted that practice or training approaches do not count as annual AIAs.

Typically, AIAs for airports with available instrument approaches utilized by advanced aircraft will average between one and two percent of itinerant operations. In the Lake Havasu City area, weather conditions rarely necessitate an instrument approach. In environments similar to the Lake Havasu City area, five-tenths of one percent of itinerant operations has been utilized to estimate potential future instrument approaches. A forecast utilizing this percentage is shown on **Exhibit 2F**.

The increased availability of low-cost navigational equipment could allow smaller and less sophisticated aircraft to utilize instrument approaches. National trends indicate an increasing percentage of approaches given the greater availability of approaches at airports with GPS and the availability of more cost-effective equipment.

SUMMARY

This chapter has provided demand-based forecasts of aviation activity at Lake Havasu City Municipal Airport over the next 20 years. **Exhibit 2F** presents a summary of the aviation forecasts developed for the 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 will be to assess the capacity of existing facilities, their ability to meet forecast demand, and to identify changes to the airfield and/or landside facilities which will create a more functional aviation facility.

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. 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.

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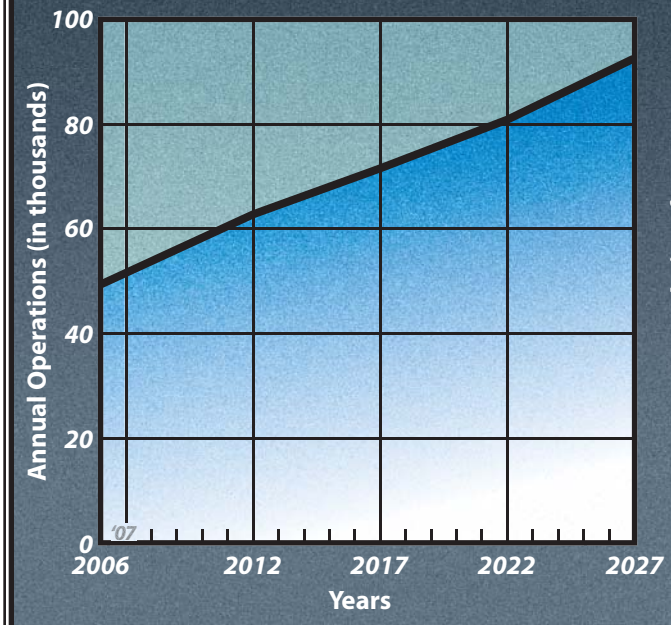
	2006	2012	2017	2022	2027
ANNUAL OPERATIONS FORECAST					
Itinerant					
Air Carrier	1,254	1,800	1,900	2,100	2,400
Air Taxi	1,600	2,100	2,700	3,500	4,400
General Aviation	22,600	28,000	29,900	33,700	38,300
Military	360	400	400	400	400
Total Itinerant	***25,814***	***32,300***	***34,900***	***39,700***	***45,500***
Local					
General Aviation	23,360	30,300	36,500	41,100	46,900
Total Local	***23,360***	***30,300***	***36,500***	***41,100***	***46,900***
Total Operations	***49,174***	***62,600***	***71,400***	***80,700***	***92,400***
ANNUAL ENPLANEMENTS					
Airport Total	***6,085***	***9,500***	***11,000***	***13,000***	***16,000***
BASED AIRCRAFT FORECAST					
General Aviation Based Aircraft					
Single Engine	169	202	228	255	279
Multi-Engine	34	34	35	35	36
Turboprop	9	11	12	13	15
Jet	9	10	11	12	14
Helicopter	6	6	7	8	9
Ultralight	2	2	2	2	2
Total GA Based Aircraft	***229***	***265***	***295***	***325***	***355***
PEAK OPERATIONS					
General Aviation					
Peak Month	5,750	7,296	8,340	9,444	10,800
Design Day	192	243	278	314	360
Busy Day	240	303	348	392	450
Design Hour	29	36	42	47	54
Air Carrier					
Peak Month	128	207	219	241	276
Design Day	4	4	6	8	10
Design Hour	2	2	2	2	4
ANNUAL INSTRUMENT APPROACHES					
Airport Total	***129***	***161***	***175***	***198***	***228***



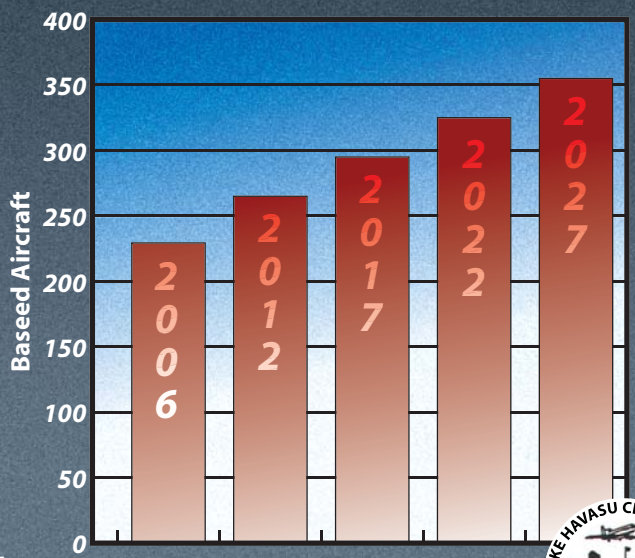


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Exhibit 2F
FORECAST SUMMARY