Chapter Two: Aviation Forecasts

LAUGHLIN BULLHEAD INTERNATIONAL Airport

Chapter Two
AVIATION FORECASTS

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 Laughlin/Bullhead International Airport (IFP), this involves projecting potential aviation demand for a 20-year timeframe. In this Master Plan, forecasts of passenger enplanements, enplaned air cargo, based aircraft, and operations (takeoffs and landings) will be considered and 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 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 the 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
- Be based on the latest available data
- Reflect current conditions at the airport
- Be 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 Laughlin/Bullhead International 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 Laughlin/Bullhead International 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 Laughlin/Bullhead International Airport.

REGIONAL SOCIOECONOMIC CHARACTERISTICS

The socioeconomic profile provides a general look at the socioeconomic makeup of the City of Bullhead and the region. It also provides an understanding of the dynamics for growth and the potential changes

in the community that may influence current and future aviation demand at Laughlin/Bullhead International Airport. Some of these characteristics would include population base, employment, and income. While Laughlin, Nevada is certainly part of the Laughlin/Bullhead International Airport service area, projections of population, income, and employment specific to Laughlin, Nevada are not available. Laughlin demographic profiles are typically combined with those of Clark County, Nevada.

POPULATION

Population is a basic demographic element to consider when planning for future aviation demand. This characteristic is important as highly concentrated population centers generally form around stable, strong, and diverse economic areas. **Table 2A** presents population information for the region.

Over the past 20 years, the City of Bullhead's population has grown at an average annual rate of 3.9 percent, while Mohave County has grown at 4.5 percent annually. The Arizona Department of Economic Security projects population growth for both the City and County to slow over the next 20 years. The City of Bullhead City is projected to grow at 1.5 percent annually, while the County is projected to grow at 2.2 percent annually.

Table 2A
HISTORICAL AND FORECAST POPULATION

Year	City of Bullhead City	Mohave County
Historical		
1988	19,950	87,900
1989	21,009	92,800
1990	22,228	95,400
1991	23,615	102,375
1992	24,665	105,725
1993	25,825	114,000
1994	26,535	120,325
1995	26,940	124,500
1996	27,370	127,700
1997	27,800	133,550
1998	28,535	138,625
1999	29,315	142,925
2000	33,769	155,032
2001	34,615	161,580
2002	35,410	166,465
2003	35,760	170,805
2004	36,960	180,150
2005	38,210	188,035
2006	39,930	198,320
2007	41,000	204,122
AAGR	3.9%	4.5%
Forecasts		
2012	44,422	234,196
2017	48,513	264,600
2022	52,262	292,462
2027	55,596	317,239
AAGR	1.5%	2.2%

Source: Arizona Department of Economic Security
AAGR: Average Annual Growth Rate

EMPLOYMENT

Employment characteristics for Mohave County as a whole are shown in **Table 2B**. Employment within the County is centered on retail trade, services, and the finance/insurance/real estate sectors. These three sectors represent over half of all employment. Collectively, the local, state, and federal governments are the next largest employment sectors. In the future, the retail trade, services, and the finance/insurance/real estate sectors will continue to employ the largest numbers of people, followed by the government sectors. The services and retail trade industries will add the greatest number of employees. For the services sectors, over 15,000 new positions will be created. Nearly 11,000 new positions will be added in retail trade.

INCOME

Table 2B summarizes per capita personal income (PCPI) for Mohave County. PCPI is expected to grow by over $7,000 annually by 2027, or by 33 percent. PCPI in Mohave County trails the State of Arizona PCPI by approximately $10,000 annually.

Table 2B
EMPLOYMENT AND INCOME - MOHAVE COUNTY

Sector	2007	2012	2017	2027
Total Employment (Thousands)	74.4	85.4	96.4	118.4
Farm	0.5	0.5	0.5	0.5
Agricultural Services	0.9	1.0	1.1	1.3
Mining	0.1	0.1	0.1	0.2
Construction	8.0	8.4	8.7	9.4
Manufacturing	4.6	4.6	4.6	4.6
Transportation, Commercial, & Public Utilities	3.4	4.1	4.9	6.3
Wholesale Trade	1.7	2.2	2.7	3.6
Retail Trade	16.9	19.6	22.3	27.8
Finance, Insurance, & Real Estate	6.8	7.6	8.4	10.1
Services	22.5	26.5	30.4	38.4
Federal Civilian	0.6	0.6	0.7	0.8
Federal Military	0.4	0.4	0.4	0.4
State and Local Government	7.9	9.7	11.5	15.2
Per Capita Personal Income (PCPI) $2004	$21,597	$23,066	$24,711	$28,708

Source: The Complete Economic and Demographic Data Source, 2007, Woods & Poole, Economics

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 trend line/time-series projections, correlation/regression analysis, and market share analysis.

Trend line/time-series projections are probably the simplest and most familiar of the forecasting techniques. By fitting growth curves to historical data and then extending them into the future, a basic trend line projection is produced. A basic assumption of this technique is that outside factors will continue to affect aviation demand in much the same manner as in the past. As broad as this assumption may be, the trend line projection does serve as a reliable benchmark for comparing other projections.

Correlation analysis provides a measure of direct relationship between two separate sets of historic data. Should there be a reasonable correlation between the data sets, further evaluation using regression analysis may be employed.

Regression analysis measures statistical relationships between dependent and independent variables, yielding a "correlation coefficient." The correlation coefficient (Pearson's "r") measures association between the changes in the dependent variable and the independent variable(s). If the "r^2" value (coefficient determination) is greater than 0.95, it indicates good predictive reliability. A value less than 0.95 may be used, but with the understanding that the predictive reliability is lower.

Market share analysis involves a historical review of the airport activity as a percentage, or share, of a larger regional, state, or national aviation market. A

historical market share trend is determined, providing an expected market share for the future. These shares are then multiplied by the forecasts of the larger geographical area to produce a market share projection. This method has the same limitations as trend line projections, but can provide a useful check on the validity of other forecasting techniques.

It is important to note that one should not assume a high level of confidence in forecasts that extend beyond five years. Facility and financial planning usually require at least a 10-year preview, since it often takes more than five years to complete a major facility development program. However, it is important to use forecasts which do not overestimate revenue-generating capabilities or understate demand for facilities needed to meet public (user) needs.

COMMERCIAL SERVICE

To determine the types and sizes of facilities necessary to properly accommodate present and future airline activity at any airport, two basic elements must be forecast: annual enplaned passengers and annual aircraft operations. The number of annual enplaned passengers is the most basic indicator of demand for commercial service activity. From a forecast of annual enplanements, operations and other activity descriptors can be projected based upon behavioral factors characteristic of Laughlin/Bullhead International Airport or the airline industry as a whole.

The term "enplanement" refers to a passenger boarding an airline flight. Enplaning passengers are then described in terms of "originating" or "transfer." Originating passengers are those who board and depart in a commercial service aircraft from an airport. Transfer passengers are all others, including those who have departed from another location and are aboard aircraft using the airport as an intermediate stop. There are generally no transfer passengers at Laughlin/Bullhead International Airport.

NATIONAL FORECASTS

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 terrorist incidents against either U.S. or world aviation).

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, and 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 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.

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 revenue passenger miles (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.

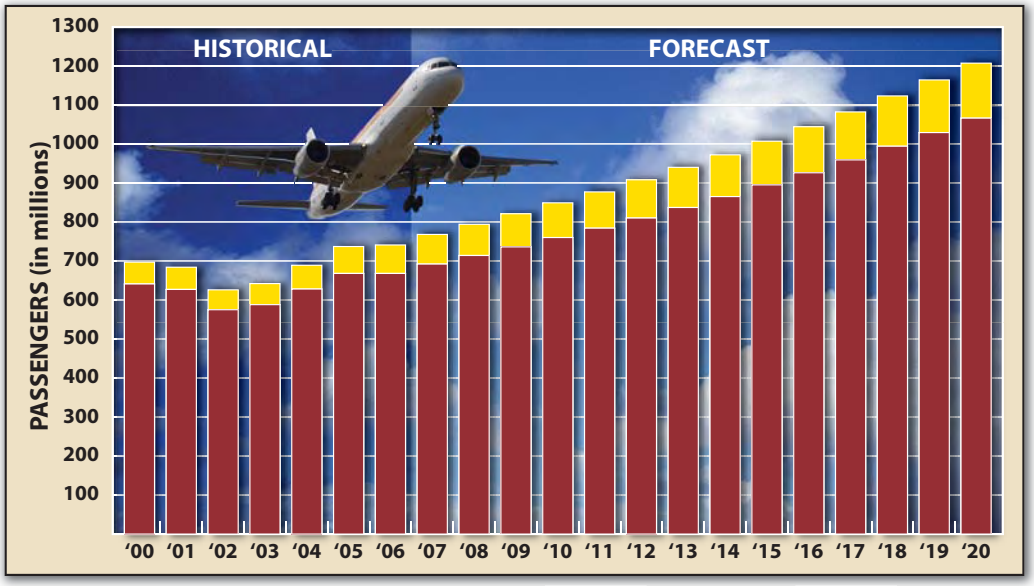
Passenger demand growth is also projected to rebound, with RPMs forecast to increase 3.4 percent as passenger enplanements rise 3.7 percent. Growth is projected to accelerate in 2008 as RPMs and en-

planements 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 carriers is depicted on **Exhibit 2A**, while national enplanement history and projections for 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 large number of 70-90 seat regional aircraft that are entering the fleet and the ongoing 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.

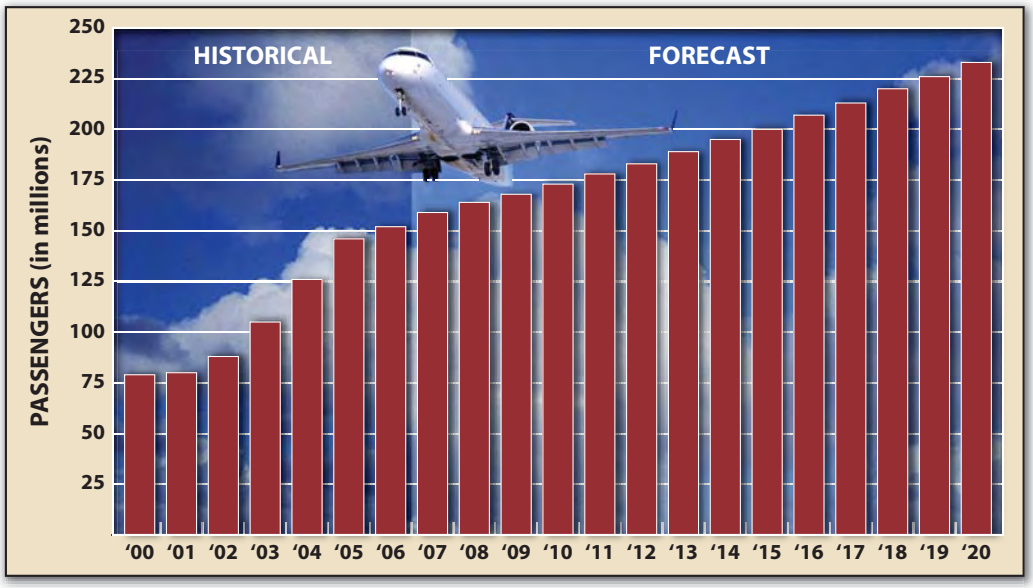
By 2020, aircraft are forecast to become fuller as load factors increase from the record high of 78.8

Exhibit 2A
U.S. SCHEDULED COMMERCIAL AIR CARRIER PASSENGER ENPLANEMENTS



Source: FAA Aerospace Forecasts, FY 2007-2020

Exhibit 2B
U.S. REGIONAL/COMMUTERS SCHEDULED PASSENGER ENPLANEMENTS



Source: FAA Aerospace Forecasts, FY 2007-2020

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.

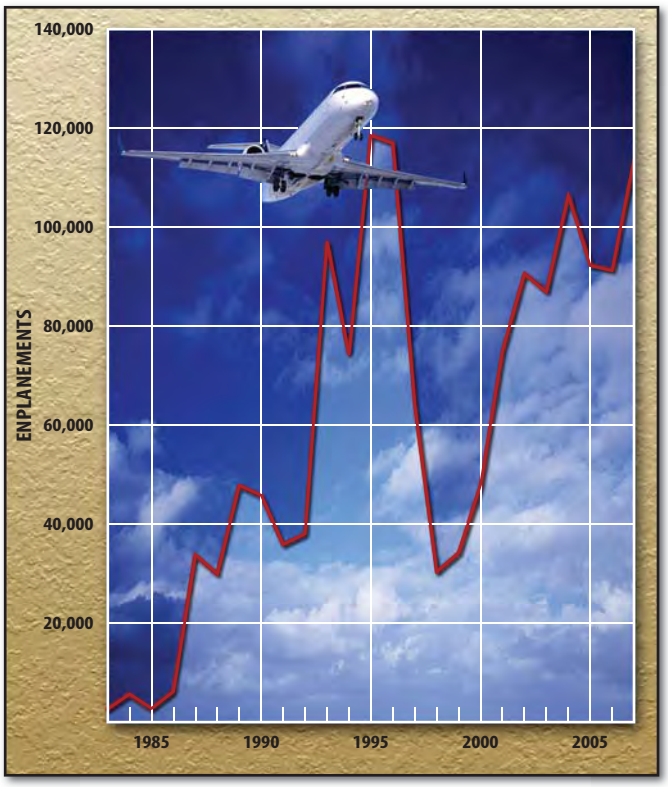
The number of passenger jets in the mainline carrier fleet fell by 39 aircraft in 2006, but is expected to increase by 92 aircraft in 2007 and 108 aircraft in 2008. Over the remaining 12 years of the FAA forecast, the mainline passenger fleet increases by an average of 163 aircraft per year, reaching 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.

AIR SERVICE HISTORY

Exhibit 2C and **Table 2C** examine records of annual passenger enplanements at Laughlin/Bullhead International Airport since 1983. Over the past 25 years, the airport has experienced significant changes in air service and corresponding changes in annual passenger enplanements.

Exhibit 2C
HISTORICAL ENPLANEMENTS



Two periods of quick growth occurred in 1986 and 1993. Between 1986 and 1987, passenger enplanements grew over five-fold from 6,213 enplanements to 33,819 as the airport experienced its first significant improvements in scheduled air service from commuter airlines using aircraft with 36 or less seats. The next period of strong growth occurred in 1993 when annual enplanements jumped from 38,068 to 97,095. In 1992, the existing runway and passenger terminal facilities were completed which allowed the airport to accommodate large commercial airline transport jet aircraft. In 1993, the airport began to handle several large transport jet charter flights, and Morris Air began scheduled air service with Boeing 737-300 aircraft.

Passenger traffic reached a 25-year high in 1995 with 118,484 enplanements. While Morris Air (which had been acquired by Southwest Airlines) no longer provided regularly scheduled service to Laughlin/Bullhead International Airport, Reno Air

Table 2C
HISTORICAL ENPLANEMENTS

Year	IFP Enplanements	Annual Change
1983	2,695	NA
1984	5,667	110%
1985	2,778	-51%
1986	6,213	124%
1987	33,819	444%
1988	29,969	-11%
1989	47,830	60%
1990	45,823	-4%
1991	35,921	-22%
1992	38,068	6%
1993	97,095	155%
1994	74,194	-24%
1995	118,484	60%
1996	116,907	-1%
1997	64,094	-45%
1998	30,387	-53%
1999	34,195	13%
2000	47,920	40%
2001	75,020	57%
2002	90,510	21%
2003	86,855	-4%
2004	106,347	22%
2005	92,206	-13%
2006	91,201	-1%
2007	113,796	25%
2008	123,124	8.2%
AAGR 1983-2008	16.5%	NA
AAGR 1988-2008	7.3%	NA
AAGR 1998-2008	15.0%	NA

Source: Airport Records
AAGR - Average Annual Growth Rate
IFP - Laughlin/Bullhead International Airport

had initiated scheduled service with MD-80 aircraft. America West Express and United Express provided scheduled commuter flights with 19 passenger aircraft to Phoenix and Los Angeles. Charter traffic was a major portion of this activity as well. Charter airlines like Great American and Sun Country carried over half of the total passengers.

By 1998, passenger levels had declined to 30,387, falling more than 74 percent from the 1995 all-time high. Reno Air, under new management and restructuring its route system, discontinued service to Laughlin/Bullhead International Airport in May. Great American Airlines ceased all operations a month earlier in April. United Express had discontinued flights to Laughlin/Bullhead International in November 1996. In 1998, expansion of casino gaming throughout the country, the rise of the American dollar overseas, and the recession in Asia had caused America West Express to reduce its schedule to four flights a day.

Since 1998, the airport has experienced increased annual enplanements each year except in 2003 when enplanements were down four percent. This decline is most likely related to the national recession occurring during this period. The growth pattern for the airport since 1998 is in contrast to most commercial service airports which experienced significant declines in enplanements in 2002 following the events of 9/11. Between 2001 and 2002, the airport grew enplanements by 15 percent. By 2007, enplanements had reached 113,796, a 274 percent increase over the 1998 low. In 2008, enplanements reached an all-time high of 123,124.

The airport has been without daily scheduled airline service since 2001 when Mesa Airlines and Sierra Pacific discontinued service at the airport. Since 2002, the airport has been served by a number of charter airlines including Allegiant, Sun Country, West Jet, Eagle Jet, Air Canada, Ryan (Skyquest), and Canadian North. In 2007 and early 2008, Allegiant, Sun Country, and Canadian North still served the airport. In 2007, Allegiant and Sun Country provided year-round service while Canadian North only provided service during the winter months.

SERVICE AREA

The service area of an airport is defined by its proximity to other airports providing similar service. Laughlin/Bullhead International Airport is one of three airports in Mohave County that has provided

or is now providing commercial air service. Starting April 7, 2009, Kingman Airport will once again provide daily essential air service (EAS) subsidized flights to Phoenix. Lake Havasu Municipal Airport does not have daily scheduled airline service.

The Laughlin/Bullhead International Airport service area is significantly influenced by the presence of McCarran International Airport in Las Vegas, Nevada. McCarran International Airport is located approximately 97 miles from the City of Bullhead City via surface transportation and is drivable in approximately one and one-half hours. However, McCarran International Airport provides a significantly different level of service than Laughlin/Bullhead International Airport. Hundreds of daily flights are available from McCarran International Airport to both domestic and international destinations. McCarran International Airport is served by most legacy and low-cost carriers. As a discretionary tourist travel destination, air fare costs remain relatively low at McCarran International Airport. The low air fare costs attract travelers from a wide area surrounding Las Vegas, including much of Mohave County. The 1999 *Arizona Rural Air Service Study*, prepared by the Arizona Department of Transportation – Aeronautics Division (ADOT), found that a majority of Mohave County air passengers travel to McCarran International Airport instead of taking advantage of the air service provided in Mohave County.

The 2000 *State Aviation Needs Study* (SANS) prepared by the ADOT also noted that the commercial service airports in Mohave County are extremely susceptible to air passengers traveling to McCarran International Airport instead of taking advantage of the air service provided in Mohave County. For air service examinations, this is defined as leakage. The 2000 SANS noted the leakage for Laughlin/Bullhead International Airport is approximately 76 percent. In other words, 76 percent of the potential passengers for Laughlin/Bullhead International Airport are using other regional airports such as McCarran International Airport instead of Laughlin/Bullhead International Airport. Similar leakage rates were also noted for Kingman (79 percent) and Lake Havasu (74 percent) when the City had regular air service.

In 2007, the combined population of Laughlin, Nevada and the City of Bullhead City was nearly 50,000. A large majority of the leakage in the market could be the result of not having daily scheduled service to serve the needs of the air travelers from the local market. As described above, the current air service at Laughlin/Bullhead International Airport can be characterized as charter flights for tourists visiting Laughlin, Nevada. While some unsold charter seats may be available to local passengers, the destinations for each flight vary as do the return flights.

The Laughlin/Bullhead International Airport primarily serves some of the air transportation needs for casino/resort activities in Laughlin, Nevada and the surrounding Lake Mead Recreational Area each year. As such, the primary service area can be viewed as being relatively tight geographically and limited to the City of Bullhead City and Laughlin, Nevada. While the service area is small in geographical terms, the service area has more than 4 million tourists each year.

The primary service area will typically generate the majority of enplanements experienced at an airport. Most airports, however, will also attract passengers from areas outside the primary service area, or secondary service areas. Factors that can affect market share in the secondary service area include number of airlines serving the airport, frequency of flights provided, type of aircraft utilized, and nonstop destinations available. The biggest factor, however, tends to be competing air fares. Competition on routes and low-fare airlines are major factors that can draw passengers, especially vacation travelers, to drive as much as two or more hours to a larger airport.

Without daily scheduled service now, there is no viable secondary market for Laughlin/Bullhead International Airport. However, establishment of a

daily scheduled service could generate a secondary air service market for Laughlin/Bullhead International Airport. Laughlin/Bullhead International Airport is the last commercial service airport in Arizona or Nevada prior to reaching McCarran International Airport for residents of southern Mohave County. With regularly scheduled air service, Laughlin/Bullhead International Airport may also be able to capture air travelers now going directly to McCarran International Airport from the south-central and southwest portions of the county. While improved air service at Laughlin/Bullhead International Airport could attract air travelers from the south-central and southwest portions of Mohave County, these passengers will not be as reliable as they will be selective about which airport they utilize on a trip-by-trip basis. McCarran International Airport will be a choice for air travelers in Mohave County due to its air fare costs, schedule, and number and types of airlines.

ENPLANEMENT FORECASTS

Regression Analysis

The first method used to project enplanements at Laughlin/Bullhead International Airport involved time-series and regression analyses with regional socioeconomic factors such as historical Mohave County population and historical Bullhead City population. These analyses each yielded a correlation coefficient less than 0.95. As previously mentioned, an "r^2" value of less than 0.95 reduces predictive reliability. The fluctuating enplanement trend between 1983 and 2007, combined with the generally increasing socioeconomic conditions of the area, do not provide a good statistical correlation. The best correlations were the time-series analysis during the 1983-2007 periods, having an r^2 value of 0.569, and the 1998-2007 periods having an r^2 value of 0.831. Although the correlations are below 0.95, the resulting projections are still useful to indicate the extrapolation of the historic growth pattern in enplanements and are included in the enplanement forecast summary below.

Market Share of U.S. Domestic Enplanements

Another forecasting method examined the airport's historic market share of U.S. domestic enplanements. National forecasts of U.S. domestic enplanements are compiled each year by the FAA and consider the state of the economy, fuel prices, and prior year developments. According to the most recent publication, FAA *Aerospace Forecasts, Fiscal Years 2007-2020*, domestic passenger enplanements are forecast to increase at an average annual rate of 3.4 percent over the 13-year forecast period.

Table 2D examines scheduled enplanements at Laughlin/Bullhead International Airport as a percentage of total domestic U.S. airline enplanements since 1983. The average market share between 1983 and 2007 was 0.011 percent; however, this period included the highest enplanement level ever reached at the airport in 1995. Over the past 10 years, the average market share is nearly identical at 0.012 percent, even though this market share has increased from 0.005 percent in 1998 to 0.016 in 2007.

Table 2D
HISTORICAL AND FORECAST ENPLANEMENTS SHARE OF U.S. DOMESTIC ENPLANEMENTS

Year	IFP Enplanements	U.S. Domestic Enplanements (millions)	IFP % Share
1983	2,695	308.1	0.001%
1984	5,667	333.8	0.002%
1985	2,778	369.9	0.001%
1986	6,213	404.7	0.002%
1987	33,819	441.2	0.008%
1988	29,969	441.2	0.007%
1989	47,830	443.6	0.011%

Table 2D (continued)
HISTORICAL AND FORECAST ENPLANEMENTS
SHARE OF U.S. DOMESTIC ENPLANEMENTS

Year	IFP Enplanements	U.S. Domestic Enplanements (millions)	IFP % Share
1990	45,823	456.6	0.010%
1991	35,921	445.9	0.008%
1992	38,068	464.7	0.008%
1993	97,095	470.4	0.021%
1994	74,194	511.3	0.015%
1995	118,484	531.1	0.022%
1996	116,907	558.1	0.021%
1997	64,094	577.8	0.011%
1998	30,387	600.6	0.005%
1999	34,195	537.8	0.006%
2000	47,920	641.2	0.007%
2001	75,020	626.8	0.012%
2002	90,510	574.6	0.016%
2003	86,855	587.8	0.015%
2004	106,347	628.5	0.017%
2005	92,206	668.0	0.014%
2006	91,201	667.7	0.014%
2007	113,796	692.3	0.016%
AAGR	16.9%	3.4%	
Constant Share			
2012	133,200	810.3	0.016%
2017	157,700	959.3	0.016%
2022	186,400	1,133.9	0.016%
2027	220,300	1,340.2	0.016%
AAGR	3.4%	3.4%	
Increasing Share			
2012	145,900	810.3	0.018%
2017	211,000	959.3	0.022%
2022	294,800	1,133.9	0.026%
2027	402,100	1,340.2	0.030%
AAGR	6.5%	3.4%	

Source for historical enplanements: Airport Records.
Source for historical and forecast US Domestic Passengers: FAA Records, 2022 and 2027 Extrapolated.
Source for forecast enplanements: Coffman Associates Analysis.
AAGR – Average Annual Growth Rate.
IFP - Laughlin/Bullhead International Airport.

Two projections were developed utilizing the market share of U.S. domestic enplanements. First, a constant ratio considered the 2007 market share remaining the same through the planning period at 0.016 percent. This projection yielded 220,300 enplanements in 2027. Second, an increasing market share projection, mirroring the growth trend in the past 10 years, yields 402,100 enplanements at Laughlin/Bullhead International Airport in 2027.

Comparable Market Analysis

There are a variety of local factors that affect the potential for passengers within each metropolitan statistical area (MSA). The MSAs with lower enplanement per resident population ratios, also known as the Travel Propensity Factor (TPF), are typically impacted by proximity to other regional airports with higher levels of service or a "hub" airport. While the higher ratios tend to be located farther from hubs, they typically have a service area that extends into other well-populated regions, or have some type of air service advantage that attracts more of those passengers that might otherwise choose the hub airport.

To gain an understanding of these air service factors in similarly-sized communities that are located at a similar distance from a hub airport, population and enplanement data for six communities across the contiguous United States was collected. As shown in **Table 2E**, the TPF for similarly-size communities varies. For the communities in **Table 2E**, the TPF varies from 0.14 to 0.98.

With the exception of Laughlin/Bullhead International Airport, all airports included in **Table 2E** had air service to the nearby regional hub. Each of these airports also had regularly scheduled air service and competition increased enplanement levels. St. Cloud Regional Airport has one air carrier and the lowest TPF of all the communities examined. Rochester International Airport, Easterwood Field, and Tyler-Pounds Regional Airport had two air carriers. Charlottesville-Albemarle Airport had five carriers, and Bellingham Municipal Airport had four air carriers.

Table 2E
COMPARABLE AIR SERVICE MARKETS

MSA	Closest Airport Scheduled Service	2000 Population	2006 Population	2000 Enplanements	2006 Enplanements	2000 TPF	2006 TPF	Nearest Hub Airport	Distance (Miles)
St. Cloud, MN	St. Cloud Regional Airport	168,064	182,784	23,240	25,094	.14	0.14	Minneapolis	70
Rochester, MN	Rochester International Airport	164,390	179,573	150,516	149,600	.92	0.83	Minneapolis	87
Bellingham, WA	Bellingham Municipal Airport	167,656	185,953	112,515	135,129	.67	0.73	Seattle	89
College Station - Bryan, TX	Easterwood Field	185,138	192,152	90,736	85,754	.49	0.45	Houston	94
Mohave County, AZ	**Laughlin/Bullhead International Airport**	**155,032**	**193,035**	**41,920**	**89,316**	**.31**	**0.46**	**Las Vegas**	**97**
Tyler, TX	Tyle Pounds Regional Airport	175,453	194,635	71,715	79,076	.41	0.41	Dallas	102
Charlottesville, VA	Charlottesville-Albemarle Airport	174,733	190,278	165,938	185,891	.95	0.98	Dulles	103

Source: Coffman Associates Analysis
Historical Population - Proximity One
Historical Enplanements - FAA
TPF - Travel Propensity Factor

Both Rochester International Airport and Easterwood Field had lower enplanement levels in 2006 than in 2000. As such, these airports are most likely still recovering from the events of 9/11. While enplanements grew for St. Cloud Regional Airport and Tyler-Pounds Regional Airport, the TPF remained static. The TPF grew in all remaining communities.

The Laughlin/Bullhead International Airport is located approximately mid-range in the TPF ratios presented in **Table 2E**. As evidenced in the table, some airports at similar distances to hub airports as Laughlin/Bullhead International Airport capture higher level of enplanements. For example, Rochester International Airport and Charlottesville-Albemarle Airport have a TPF more than double that of Laughlin/Bullhead International Airport. This clearly demonstrates the leakage in the Laughlin/Bullhead market and the potential for higher enplanement levels at the airport.

TPF ratios can provide a useful forecasting tool. **Table 2F** presents historical TPF ratios for Laughlin/Bullhead International Airport since 1988 and two TPF ratio projections. As indicated in the table, Laughlin/Bullhead International Airport TPF peaked in 1995 at 0.95 when the airport recorded its highest enplanement levels in the past 25 years. The TPF is higher in 2007 than in 1998, but lower than the most recent 10-year high of 0.59 experienced in 2004.

The first projection considered a continued constant TPF ratio of 0.56 throughout the planning period. This forecast would suggest that enplanement growth would continue to mirror exactly the resident population growth in the County. This projection yields 177,700 enplanements by 2027. The second projection considers the TPF growing to historical levels previously achieved in the 1990s and similar to comparable communities. The increasing TPF projection presented in **Table 2F** considers the TPF increasing to 1.0 by 2027, which yields 317,200 enplanements.

FAA Terminal Area Forecast

The FAA *Terminal Area Forecast* (TAF), released in December 2007, is considered for comparative purposes. The FAA TAF is aligned with the federal fiscal year which begins on October 1. The FAA TAF used Fiscal Year 2006 as its base year for enplanements

Table 2F
HISTORICAL AND FORECAST ENPLANEMENTS
TRAVEL PROPENSITY FACTOR (TPF)

Year	Enplanements	County Population	TPF
1988	29,969	87,900	0.34
1989	47,830	92,800	0.52
1990	45,823	95,400	0.48
1991	35,921	102,375	0.35
1992	38,068	105,725	0.36
1993	97,095	114,000	0.85
1994	74,194	120,325	0.62
1995	118,484	124,500	0.95
1996	116,907	127,700	0.92
1997	64,094	133,550	0.48
1998	30,387	138,625	0.22
1999	34,195	142,925	0.24
2000	47,920	155,032	0.31
2001	75,020	161,580	0.46
2002	90,510	166,465	0.54
2003	86,855	170,805	0.51
2004	106,347	180,150	0.59
2005	92,206	188,035	0.49
2006	91,201	198,320	0.46
2007	113,796	204,122	0.56
AAGR	7.3%	4.5%	
Constant Ratio			
2012	131,100	234,196	0.56
2017	148,200	264,600	0.56
2022	163,800	292,462	0.56
2027	177,700	317,239	0.56
AAGR	2.3%	2.2%	
Increasing Ratio			
2012	140,500	234,196	0.60
2017	198,500	264,600	0.75
2022	248,600	292,462	0.85
2027	317,200	317,239	1.00
AAGR	5.3%	2.2%	

Source for historical enplanements: Airport Records.
Source for historical and forecast population:
Arizona Department of Economic Security.
Source for forecast enplanements:
Coffman Associates Analysis.
AAGR - Average Annual Growth Rate.
TPF - Travel Propensity Factor.

at Laughlin/Bullhead International Airport. The FAA projects the airport's enplanements to reach 130,837 by 2022 (no 2027 forecast is provided in the 2007 TAF).

ADOT SANS

The 2000 SANS also provides projections of future annual enplanements at the airport. The 2000 SANS utilized 1998 base year data and projected annual enplanements growing to 101,000 by 2017. Since this forecast is more than 10 years old and has already been exceeded, it is removed from further consideration.

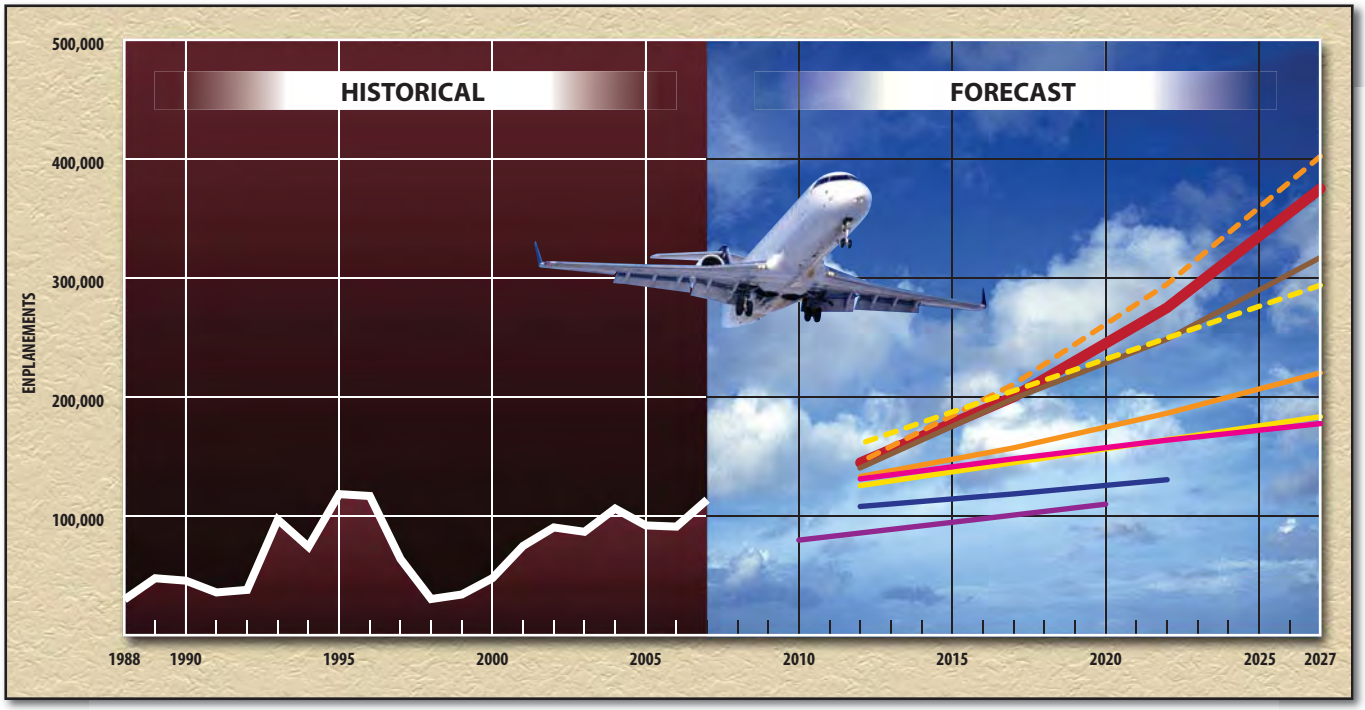
Enplanement Projections Summary

This section has presented an array of enplanement projections utilizing several forecasting methods. The most reliable approach to estimating aviation demand is through the utilization of more than one analytical technique. Oftentimes, it is the combination of several forecasts which point to a certain trend. Other times, the variety of forecasts serve to establish a planning "envelope" from which the selection of one or a combination of several forecasts can be made. The envelope is usually defined by high and low projections, whereas the remainder will fall somewhere in the middle. **Exhibit 2D** graphically depicts the enplanement projections presented earlier.

As shown on the exhibit, the FAA's TAF lies at the low end of the planning envelope. The TAF enplanement forecast more than likely understates long term growth potential for the airport, as the 2012 TAF forecast was surpassed in 2007 and the 2022 forecast is only 17,000 enplanements higher than in 2007.

Two forecasts which lie higher in the planning envelope than the TAF, but closely to each other, are more representative of the low end of the planning

Exhibit 2D
ENPLANEMENT FORECASTS



LEGEND

Time Series
1983-2007
1998-2007

Share of Domestic Enplanements
Constant Share
Increasing Share

2000 State Aviation Needs Study (SANS)
Static Travel Propensity Factor (TPF)
Increasing Travel Propensity Factor (TPF)
2007 FAA Terminal Area Forecast (TAF)
Selected Forecast

envelope. These forecasts are the 1983-2007 time-series projection and the constant TPF ratio projection. These forecasts project enplanements growing at 2.4 percent and 2.3 percent annually, respectively.

The increasing market share of national airline enplanement is the strongest enplanement projection and lies at the upper end of the planning envelope. The increasing TPF projection, 1998-2007 time-series projection, and the constant market share of national airline enplanements lie within the planning envelope. **Table 2G** summarizes all enplanement projections for this analysis.

The selected planning forecast falls near the high end of the planning envelope and closely follows the increasing TPF projection through 2020, then moves closer to the increasing market share of national airline enplanement projections through the end of the planning period. This forecast projects enplanements growing at 6.1 percent annually through 2027. For perspective, the airport averaged an annual growth rate of 16.9 percent between 1983 and 2007, and 15.8 percent between 1998 and 2007. Over the past 20-year period between 1988 and 2007, the airport averaged 7.3 percent annual growth.

To achieve the planning forecast, air service improvements will be necessary. Daily jet service to regional hubs will be necessary to attract the local and business air travelers that are presently not served by the charter flights to and from the airport and now represent nearly all of the passenger

Table 2G
ANNUAL ENPLANEMENT FORECAST SUMMARY

Forecast	2008	2012	2017	2022	2027
Time Series Extrapolation					
1983-2007		125,400	144,800	164,200	183,500
1988-2007		161,000	205,300	249,600	293,900
Share of U.S. Domestic Enplanements					
Constant Share		133,200	157,700	186,400	220,300
Increasing Share		145,900	211,000	294,800	402,100
Travel Propensity Factor (TPF)					
Static		131,100	148,200	163,800	177,700
Increasing		140,500	198,500	248,600	317,200
Comparable Forecasts					
2000 State Aviation Needs Study (SANS)		86,000	101,000	NA	NA
2007 FAA Terminal Area Forecast		108,012	118,876	130,837	NA
Planning Forecast	123,124	145,000	200,000	275,000	375,000

Source: Coffman Associates Analysis
NA - Not Available
2012 & 2017 SANS extrapolated by Coffman Associates

leakage. These passengers are now required to utilize regional airports and most likely will use McCarran International Airport for air travel. Service to western U.S. hubs such as Phoenix, Los Angeles, and Salt Lake City should be considered as these hubs already have significant regular regional airline service and provide connecting service to most domestic cities. The Los Angeles metropolitan area is also a large source of visitors to southern Mohave County. Regular daily jet service may also be able to capture passengers in the secondary air service area. As shown through the comparable markets analysis above, increased competition through the availability of two or more airlines is necessary to achieve higher forecast enplanement levels.

Historically, the Laughlin/Bullhead market has supported daily jet service. In the mid-1990s, the airport grew to an all-time peak of passenger enplanements when regular air service was provided by Reno Air and Morris Air using MD-80 and 737 aircraft. The 2000 SANS indicated that similar service could be conceivable in the future for the Laughlin/Bullhead market, especially given that the Laughlin gaming/resort market has grown and offers a unique experience relative to Las Vegas and other regional gaming alternatives.

Fleet Mix and Operations Forecast

The fleet mix defines a number of key parameters in airport planning, including critical aircraft, stage length capabilities, and terminal gate configurations. Changes in equipment, airframes, and engines have always had a significant impact on airlines and airport planning. There are many ongoing programs by the manufacturers to improve performance characteristics. These programs are focusing on improvements in fuel efficiency, noise suppression, and the reduction of air emissions. A fleet mix projection for Laughlin/Bullhead International Airport has been developed by reviewing the aircraft historically used by air carriers serving the airport.

The fleet mix projections have been used to calculate the average seats per departure, which, after applying a boarding load factor, were used to

project annual departures. A boarding load factor is the percentage of enplanements to 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.

As previously mentioned, three air carriers currently provide passenger service to Laughlin/Bullhead International Airport. Allegiant Airlines utilizes 150-seat MD-83 aircraft. Sun Country utilizes 162-seat 737-800 aircraft, while Canadian North utilizes 112-seat 737-200 aircraft. **Table 2H** presents historical airline operations information.

As indicated in the table, the charter-type service at Laughlin/Bullhead International Airport has buoyed the boarding load factor (BLF) in recent years as the air carriers maximize sold seats for each flight. As indicated, the BLF was 82 percent in 2006 and 78 percent in 2007. Nationally, the average BLF is 73.8 percent.

The overriding assumption of the fleet mix and operations forecast is that regular passenger service will begin in the early portion of the planning period. This service is assumed to be provided by regional jet aircraft in the 50- to 70- seat range. This category includes the Canadair CRJ200 and CRJ700 series regional jets and the Embraer EMB-145 and 170 regional jets. Regional jets have replaced the 737, MD-80, and DC-9 series of aircraft on feeder routes to hub airports across the country. In fact, regional jets comprise the majority of operations at airports up to 750,000 annual enplanements. As enplanements grow, scheduled passenger service is expected to include larger regional jets with 90 or more passenger seats and perhaps larger transport aircraft such as the 737. Charter service with large transport aircraft, such as the 737 and MD-80 series of aircraft, is projected to continue through the planning period.

Nationally, the FAA projects the average BLF to rise annually though the planning period. However, it is expected that the Laughlin/Bullhead International Airport BLF will experience a temporary decline near the beginning of the planning period as regularly scheduled service is initiated at the airport. The drop in the BLF is the result of the high number of seats which will become available once daily service begins. Similar to the national trend, however, the BLF for the airport will then increase over the remainder of the planning period, reaching 60 percent by 2027.

Table 2H
AIRLINE FLEET MIX AND OPERATIONS FORECAST

	Historical		Forecasts			
SEATING RANGE (TYPICAL AIRCRAFT)	2006	2007	2012	2017	2022	2027
>130 (MD-83/87, A320, B737-900, A310)	97%	98%	46%	31%	25%	20%
90 -129 (CRJ 900, B737-200/700, A318)	3%	2%	1%	35%	40%	45%
50-90 (CRJ-200, ERJ 175)	0%	0%	53%	34%	35%	40%
SEATS PER DEPARTURE	149	150	107	102	98	99
BOARDING LOAD FACTOR	82%	78%	53%	55%	57%	60%
ENPLANEMENTS PER DEPARTURE	122	117	57	56	56	59
ANNUAL ENPLANEMENTS	91,201	113,796	145,000	200,000	275,000	375,000
ANNUAL DEPARTURES	746	972	2,600	3,600	4,900	6,300
ANNUAL OPERATIONS	1,492	1,944	5,200	7,200	9,800	12,600

Source for historical information: Airport Records
Source for forecasts: Coffman Associates Analysis

To compute annual operations, the average seats-per-aircraft was first multiplied by the boarding load factor to obtain average enplanements per departure. Then, forecast operations were obtained by multiplying the number of departures by two. **Table 2H** summarizes the airline operations forecasts according to passenger levels, aircraft mix, and boarding load factors.

AIR CARGO FORECASTS

Air cargo traffic is comprised of freight/express and mail. Air cargo is moved either in the bellies of passenger aircraft or in dedicated all-cargo aircraft. FAA data and forecasts are presented in revenue-ton-miles (RTMs).

NATIONAL FORECASTS

Air cargo activity has historically had a high correlation to Gross Domestic Product (GDP). Other factors that affect air cargo growth are real yields, improved productivity, and globalization. Ongoing trends that are and will continue to improve the air cargo market include the opportunities from open skies agreements, decreasing costs from global airline alliances, and increasing business volumes from e-commerce. At the same time, trends that could limit air cargo growth include increased use of e-mail, decreased costs of sending documents by facsimile, and increased airline costs due to environmental and security restrictions.

Before 2001, air cargo was the fastest growing sector of the aviation industry. From 1994 through 2000, total tons and RTMs grew at annual average rates of 8.0 and 8.6 percent. An economic slowdown in the U.S., combined with the collapse of the high-tech industry and a slowing of imports, resulted in declines of 5.0 percent in tons and 3.9 percent in RTMs. Traffic began to recover in 2002 and is setting new record RTMs, especially in the international market.

The FAA notes there are several structural changes that are occurring within the air cargo industry. Among them are the following:

- **Security regulations** – Security regulations put in place shortly after 9/11 shifted cargo from the passenger airlines to the all-cargo airlines. Additional regulations have been put in place since that time. These include requiring the carriers to conduct random inspections, codifying and strengthening the "known shipper" program, and establishing a security program specifically to all-cargo operations by aircraft over 20,000 pounds.

- **Market maturation** – The express market in the United States has matured after dramatic growth over the last two decades. This is the majority of domestic air cargo activity.

- **Modal shift** – Improved service and economics from the use of alternative modes of cargo transported by the integrated cargo carriers (e.g., FedEx, UPS, and DHL) has matured.

- **Increased USPS use of all-cargo carriers** – This initially resulted from the U.S. Postal Service's (USPS) need to improve control over delivery. The trend has continued due to security regulations.

- **Increased use of mail substitutes** – Substitutes such as e-mail affect mail volume. The residual fear of mail because of terrorism has also been a factor.

FAA's forecasts of air cargo RTMs are predicated on several assumptions:

1) Security restrictions concerning air cargo transportation will stay in place;

2) There will be no additional terrorist attacks in the U.S.;

3) There will be continued domestic and international economic growth;

4) Most of the modal shift from air to ground has occurred; and

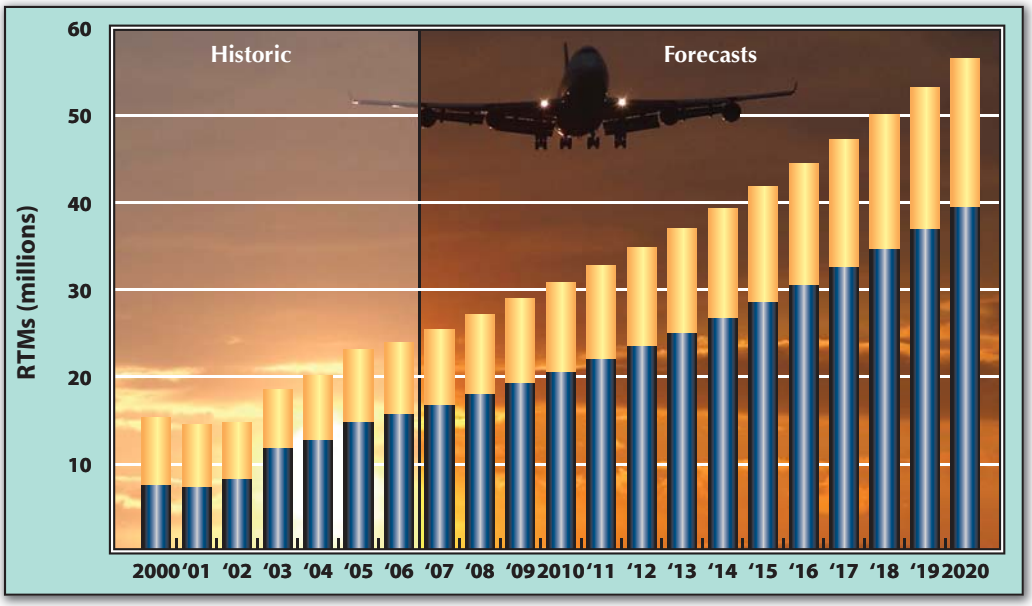
5) In the long term, cargo activity will be tied to economic growth.

The number of RTMs flown by U.S. carriers grew by 1.2 percent in 2006 to 39.7 billion. Total RTMs flown are forecast to increase 4.6 percent in 2007 and 6.1 percent in 2008. Over the following 12 years, total RTMs are projected to increase at an annual average rate of 5.2 percent. **Exhibit 2E** depicts the FAA forecasts for air cargo and mail.

in 2008. From 2008 through 2020, growth is expected to average 3.3 percent annually, based upon projected U.S. economic growth.

Between 1997 and 2006, the all-cargo carrier percentage of U.S. domestic RTMs grew from 65.4 percent to 79.4 percent. Significant growth in express service, coupled with combined higher passenger load factors leaving less room for belly cargo, were key factors in this shift. The October 2001 FAA security directive that strengthened security standards for cargo on passenger flights also impacted belly freight. By 2020, this share is projected to increase to 83.6 percent based upon increases in wide-body capacity for all-cargo carriers and security considerations.

Exhibit 2E
DOMESTIC AIR CARGO REVENUE TON MILES (RTMs) U.S. COMMERCIAL CARRIER



Source: FAA Aerospace Forecasts, FY 2007-2020
Domestic figures prior to 2003 exclude Airborne Express, Inc.

International RTMs flown by U.S. carriers grew to 24.0 billion in 2006, a 3.7 percent increase over the previous year. The FAA forecasts a 5.9 percent increase in 2007, and a 7.0 percent increase in 2008, followed by an average annual increase of 6.3 percent through 2020. The all-cargo carriers' percentage of the international market is projected to increase from 65.5 percent in 2006, to 69.7 percent by 2020, due to increased capacity.

Domestic cargo RTMs decreased 2.4 percent in 2006, to 15.7 billion. This followed a 1.6 percent decline in 2005, and was primarily due to the modal shift from air to ground and the impact of jet fuel surcharges. Domestic RTMs are projected to increase 2.7 percent in 2007 and 4.7 percent

The all-cargo large jet aircraft fleet is expected to grow from 997 in 2006, to 1,468 by 2020. Narrow-body aircraft in the fleet are projected to decline by four aircraft per year over this period. Meanwhile, wide-body aircraft are projected to increase by more than 37 aircraft annually.

ENPLANED CARGO AND OPERATIONS FORECASTS

At Laughlin/Bullhead International Airport, most air cargo is presently carried by contract carriers for FedEx and UPS. The contract carriers provide feeder services to and from regional hubs. At Laughlin/Bullhead International Airport, weekday service for FedEx is provided with Cessna Caravan aircraft, while Beechcraft 99 aircraft are used for UPS service.

Table 2J summarizes historical air cargo operations tracked by the Mohave County Airport Authority (MCAA). As shown in the table, the airport has approximately 1,100 air cargo operations each year. The MCAA does not track enplaned air cargo. Therefore, enplaned cargo was estimated for this study. This estimate was based upon multiplying the cargo carrying capacity of the aircraft that are used at the airport by the number of annual departures. As shown in the table, the airport enplanes nearly 1,300,000 pounds of air cargo each year. Enplaned air cargo was down in 2007 as the result of fewer annual operations.

As discussed above, the air cargo industry has matured as the network is fully established across the country. It is becoming rarer for airports to attract new cargo services due to the mature network. In fact, most cargo companies have shifted to trucking all air-freight within a five hour's drive of an airport served by large cargo aircraft.

The 2000 SANS noted that only Phoenix, Tucson, and Yuma would support the majority of air cargo services in the state of Arizona. Yuma would be supported by trans-border trade, while Tucson would emerge as a regional freight center due to growth in southern Arizona. Phoenix would continue as the center of air cargo activity for the state.

The 2000 SANS noted the following attributes for supporting long term air cargo activities:

1. Population mass
2. Strong base of industry and commerce, and
3. Strength of high-tech companies dependent upon air freight for just-in-time delivery

Table 2J
ENPLANED CARGO AND OPERATIONS

Year	Enplaned Cargo Pounds	Departures	Pounds Per Departure	Total Operations
Historical				
2006	1,322,400	552	2,396	1,104
2007	1,278,400	526	2,430	1,052
% Change	-3%			
Forecast				
2012	1,530,000	600	2,400	1,200
2017	1,840,000	700	2,400	1,400
2022	2,210,000	800	2,400	1,600
2027	2,640,000	1,000	2,400	2,000
AAGR	3.7%			

Source for historical operations: Airport Records
Historical enplaned cargo estimated by Coffman Associates
Forecasts: Coffman Associates Analysis
AAGR - Average Annual Growth Rate

With less population mass, smaller levels of high-tech industrial activity, and a direct roadway network to McCarran International Airport, which has larger cargo operations, it is not expected that significant increases in air cargo activity will occur at Laughlin/ Bullhead International Airport. Air cargo activity at the airport is expected to remain regional in nature with service to established regional hubs for express package delivery.

A forecast of enplaned air cargo and operations has been prepared assuming that enplaned air cargo will grow at 3.7 percent annually, consistent with projections for national air cargo growth. Annual operations were determined by multiplying annual departure by two. Annual departures were calculated by dividing enplaned air cargo by the assumed pounds per departure.

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, and annual operations.

NATIONAL FORECASTS

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 2K**, 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.

In 2004, the general aviation production showed a significant increase, returning to near pre-9/11

Table 2K
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

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 the subsequent 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 2,300 between 2000 and 2006. Corporate operators are defined as those companies that have their own flight departments and utilize general aviation aircraft to enhance productivity. **Table 2L** summarizes the number of U.S. companies operating fixed-wing turbine aircraft between 1991 and 2006.

Table 2L
U.S. COMPANIES OPERATING FIXED-WING TURBINE BUSINESS AIRCRAFT AND NUMBER OF AIRCRAFT, 1991-2006

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
2006	11,611	16,965

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 2M** summarizes the growth in fractional shares between 1986 and 2006. The number of aircraft in fractional jet programs grew rapidly from 2001 to 2006, increasing by approximately 250 aircraft. Although there is no data available, it can be projected that fractional shares and aircraft have increased even more since 2005.

Table 2M
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
2006	4,903	984

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.

In August 2007, the United States Government Accountability Office (GAO) issued a report GAO-07-1001, *VERY LIGHT JETS*, subtitled, Several Factors Could Influence Their Effect on the National Airspace System. This report was conducted in response to the VLJ phenomenon as many aviation forecasters feared the VLJ would eventually lead to significant airspace congestion. The report was not put forth to provide recommendations, but rather to provide information on the industry.

The following is the summary provided by the GAO report:

"The eight very light jet forecasts GAO examined provided a range of both the number of very light jets projected to be delivered (roughly 3,000 to 7,600) and the dates by which those numbers would be reached (from 2016 to 2025). The forecasts were based on limited information about the market for very light jets and varied based on a number of assumptions, particularly regarding the development of the air taxi market.

The studies GAO reviewed and the experts GAO contacted expressed varying opinions about the impact of very light jets on NAS capacity; however, most of the experts believed that very light jets would have little overall effect on safety. The studies found that the type of airports used by very light jets will influence very light jets' effect on capacity. Experts also mentioned other factors that could affect capacity such as aircraft usage, trip length, and altitude. Most experts GAO contacted believed that very light jets will likely have little impact on safety due to FAA's certification procedures for aircraft, pilots, and maintenance."

The report provided limited forecast information developed by eight entities, one being the FAA projections presented in the previous section. All forecasts assumed moderate to strong economic growth. Other factors which will impact the VLJ industry were also considered.

Many believe that the replacement market will be positive for the VLJ industry as older twin engine piston and turboprop aircraft are retired and some aircraft owners will likely replace them with VLJ aircraft. Another factor is the influence of high numbers of available VLJ models on the market. Rolls-Royce indicated in their analysis that there tends to be a correlation between total aircraft deliveries and number of models on the market. Other factors which will positively influence VLJ growth will be dissatisfaction with other transportation modes, low purchase price of VLJ aircraft, and access to airports with appropriate infrastructure. These factors will be more positive influences on the growth of VLJ markets. Negative factors could include uncertainty of success leading to hesitations in acquiring the VLJ, new training and high cost of insurance, as well as production constraints associated with new aircraft manufacturers.

The eight VLJ forecasts examined by the GAO were somewhat divergent. These forecasts range between 3,106 and 7,649 VLJ deliveries. The difficulty with comparing the forecasts, however, is that several have differing "out years." Some forecast through 2016, while others projected to 2020 and even 2025. **Table 2N** presents the VLJ forecast figures provided by the eight groups.

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

Table 2N
Total Forecast Number of VLJ Deliveries

Forecasting Entity	Forecast End Year	Forecast VLJs Delivered
Embraer – Without strong air taxi demand	2016	~3,000
Embraer – With strong air taxi demand	2016	~6,000
Forecast International (aerospace consulting firm)	2016	~6,000
Honeywell (manufacturer of airspace products)	2016	~5,000
PMI Media (aerospace/defense publisher)	2016	4,124
Teal Group (aerospace consulting firm)	2016	~3,000
Velocity Group (consulting firm) – Moderate air taxi growth	2016	~4,000
Velocity Group (consulting firm) – Strong air taxi growth	2016	~6,000
FAA	2020	6,300
Rolls-Royce	2025	~7,500

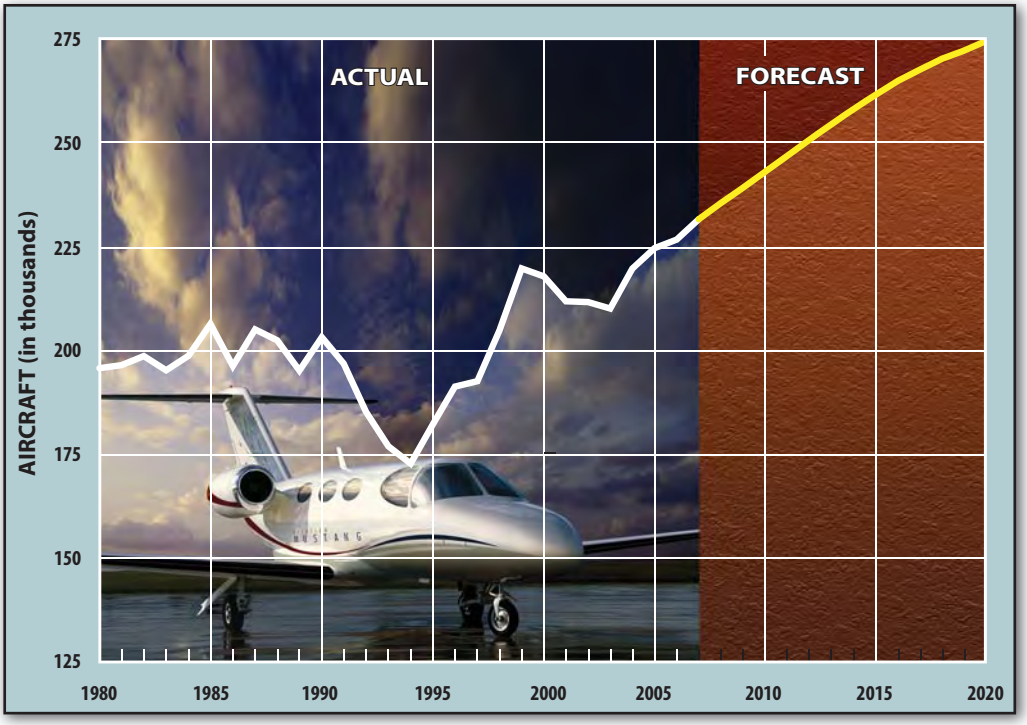
Source: FAA

will not be any new successful terrorist incidents against either 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 predicted a 4.8 percent decrease in the price of oil in 2007, followed by a 7.1 percent increase 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 2F**. 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

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



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.

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.

GENERAL AVIATION SERVICE AREA

The service area for general aviation airports is limited by other public use airports providing similar levels of service. The other public general aviation airports within 40 nautical miles of Laughlin/Bullhead International Airport were outlined in Chapter One - Inventory. Of the eight airports studied, only three provided similar services and capabilities as Laughlin/Bullhead International Airport. These included Kingman Airport, Lake Havasu Municipal Airport, and Needles Airport in California. Therefore, these three airports limit the extent of the transient service area to that of Laughlin and Bullhead City, as these other communities have a general aviation airport capable of accommodating most transient activity. Given the national trend for general aviation activities basing nearer their home or business, the general aviation service area is similarly defined as primarily the Town of Laughlin and Bullhead City. Secondary service areas include the contiguous unincorporated areas of Mohave County.

BASED AIRCRAFT FORECASTS

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. Aircraft basing at the airport is somewhat dependent upon the nature and degree of aircraft ownership in the local service area. As a result, aircraft registrations in the area were reviewed and forecast first.

Registered Aircraft Forecasts

Historical records of aircraft ownership in Mohave County were obtained from the FAA-maintained database of aircraft ownership. **Table 2P** summarizes total aircraft registrations from 1993 to 2007 for Mohave County. Over the past 15 years, 194 additional aircraft have been registered in Mohave County. Of this, the majority were single engine piston aircraft. However, there are now five registered turbojet aircraft and 46 turboprop aircraft. Helicopters and multi-engine piston aircraft have grown by 10.

TIME-SERIES ANALYSIS

Because of the relatively steady growth in registered aircraft in the county over the past 15 years, a time-series analyses for the period from 1993 to 2007 provided a reasonable correlation coefficient of 0.90. Extrapolation of this growth trend through 2027 yields 780 registered aircraft.

MARKET SHARE OF U.S. ACTIVE GENERAL AVIATION AIRCRAFT

Mohave County registered aircraft share of U.S. active general aviation aircraft is presented in **Table 2Q**. The county's market share has fluctuated from a high of 0.024 percent in 2007 to a period low of 0.0191 percent in 1999. Two projections of county registrations were developed as a comparison to U.S. active aircraft. A constant share projection of 0.024 applied to the FAA forecast of U.S. active aircraft yields 869 registered aircraft in the county by 2027. A second projection utilizing a continued increasing trend reaching 0.0293 percent yields 1,061 registered aircraft by 2027.

Table 2P
REGISTERED AIRCRAFT - MOHAVE COUNTY

Year	Total	Single Engine Piston	Multi-Engine Piston	Turboprop	Turbojet	Helicopter	Other
1993	362	313	36	1	0	10	2
1994	384	331	1	36	4	10	2
1995	381	331	37	2	0	8	3
1996	400	341	45	2	0	10	2
1997	412	353	43	1	0	12	3
1998	412	355	42	2	0	11	2
1999	419	357	42	3	0	14	3
2000	428	363	47	1	0	14	3
2001	428	372	37	3	0	13	3
2002	432	375	37	3	0	14	3
2003	465	392	42	10	2	16	3
2004	479	396	41	16	3	19	4
2005	523	437	44	11	6	20	5
2006	537	455	44	8	5	19	6
2007	556	432	46	46	5	20	7
AAGR	3.1%	2.3%	1.8%	31.5%	12.2%	5.1%	9.4%
% Growth	54%	38%	28%	4500%	500%	100%	250%
Change	194	119	10	45	5	10	5

Source: FAA Records
AAGR - Average Annual Growth Rate

Table 2Q
SHARE OF U.S. ACTIVE AIRCRAFT

Year	Mohave Registered Aircraft	U.S. Active Aircraft	Mohave County Share
Historical			
1993	362	177,119	0.204%
1994	384	172,936	0.222%
1995	381	188,089	0.203%
1996	400	191,129	0.209%
1997	412	192,414	0.214%
1998	412	204,710	0.201%
1999	419	219,464	0.191%
2000	428	217,533	0.197%
2001	428	211,535	0.202%
2002	432	211,345	0.204%
2003	465	209,788	0.222%
2004	479	219,426	0.218%
2005	523	224,352	0.233%
2006	537	226,422	0.237%
2007	556	231,343	0.240%
AAGR	3.1%	1.9%	
Constant Share			
2012	602	250,587	0.240%
2017	643	267,470	0.240%
2022	707	294,347	0.240%
2027	869	361,768	0.240%
AAGR	2.3%	2.3%	
Increasing Share			
2012	633	250,587	0.253%
2017	710	267,470	0.265%
2022	821	294,347	0.279%
2027	1,061	361,768	0.293%
AAGR	3.3%	2.3%	

Source for Historical Registered Aircraft: FAA Records
Source for Historical and Forecast U.S. Active Aircraft:
FAA Aerospace Forecasts, Selected Years, 2022 and 2027
Extrapolated
Registered Aircraft Forecasts: Coffman Associates Analysis
AAGR - Average Annual Growth Rate

RATIO OF POPULATION

Similar to enplanement projections, county registered aircraft can be linked with the local population base for forecasting purposes. The next forecast examined the historical registered aircraft as a ratio of 1,000 residents in Mohave County, as presented in **Table 2R**. As shown in the table, aircraft per capita has fluctuated from a low of 3.3 in 2007 to a high of 4.1 in 1993. A constant ratio projection of 3.3 registered aircraft per 1,000 residents yields 1,060 registered aircraft by 2027.

Table 2R
REGISTERED AIRCRAFT PER 1,000 RESIDENTS

Year	Registered Aircraft	County Population	Ratio
Historical			
1993	362	87,900	4.1
1994	384	92,800	4.1
1995	381	95,400	4.0
1996	400	102,375	3.9
1997	412	105,725	3.9
1998	412	114,000	3.6
1999	419	120,325	3.5
2000	428	124,500	3.4
2001	428	127,700	3.4
2002	432	133,550	3.2
2003	465	138,625	3.4
2004	479	142,925	3.4
2005	523	155,032	3.4
2006	537	161,580	3.3
2007	556	166,465	3.3
AAGR	3.1%	4.7%	
Constant Ratio Forecast			
2010	782	234,196	3.3
2015	884	264,600	3.3
2020	977	292,462	3.3
2025	1,060	317,239	3.3
AAGR	3.6%	3.6%	

Source for Historical and Forecast Population:
Arizona Department of Economic Security.
Source for Historical Registered Aircraft: FAA Records
Registered Aircraft Forecasts: Coffman Associates Analysis
AAGR - Average Annual Growth Rate

2000 SANS

The 2000 SANS provides a comparative forecast. As shown in **Table 2S**, the 2000 SANS projects 558 registered aircraft in 2012 and 613 registered aircraft in 2017. With 556 registered aircraft in 2007, this forecast more than likely understates growth potential and will not be considered further.

Table 2S
REGISTERED AIRCRAFT FORECAST SUMMARY

Forecast	2007	2012	2017	2022	2027
Time Series Extrapolation					
1993-2007		592	654	717	780
Share of U.S. Active Aircraft					
Constant Share		602	643	707	869
Increasing Share		633	710	821	1,061
Aircraft Per 1,000 Residents					
Constant Ratio		782	884	977	1,060
Comparable Forecasts					
2000 State Aviation Needs Study (SANS)		558	613	NA	NA
Planning Forecast	556	625	725	825	975

Source: Coffman Associates Analysis
NA - Not Available
2012 & 2017 SANS extrapolated by Coffman Associates

REGISTERED AIRCRAFT FORECAST SUMMARY

Exhibit 2G graphically presents all registered aircraft forecasts. Between 1993 and 2007, registered aircraft grew at an annual rate of 3.1 percent. Considering this historical growth pattern, the time-series projection and constant share of U.S. active aircraft projection appear to understate future growth potential. The aircraft per 1,000 residents and increasing share of U.S. active aircraft project registered aircraft growing at 3.3 percent annually through the planning period. This more than likely overstates future growth potential. The preferred planning forecast for registered aircraft is a mid-range forecast that projects registered aircraft growing at 2.8 percent through 2027.

Based Aircraft Forecasts

Having forecast the registered aircraft for Mohave County, based aircraft at Laughlin/Bullhead International Airport were reviewed to examine the potential change in market share. Historical based aircraft figures were obtained from the FAA's 5010 Form and previous Master Plan. The 2007 total was derived from an on-airport count conducted by the MCAA.

Because only limited counts of based aircraft at the airport over the past 10 years were available, time-series and regression analyses could not be performed. Instead, other methods were used to forecast based aircraft at the airport.

SHARE OF MOHAVE COUNTY
REGISTERED AIRCRAFT

The primary forecasting method of based aircraft examined the airport's market share of registered aircraft in Mohave County, which is presented in **Table 2T**. In 2007, 8.8 percent of aircraft registered in the county were based at Laughlin/Bullhead International Airport. This is a six percent decrease over the airport's market share in 1998 and may be attributable to the relocation of general aviation facilities at the airport and reduced enclosed hangar area. A constant market share (representing the 10-year average) was applied to the projections of

Exhibit 2G
REGISTERED AIRCRAFT FORECAST

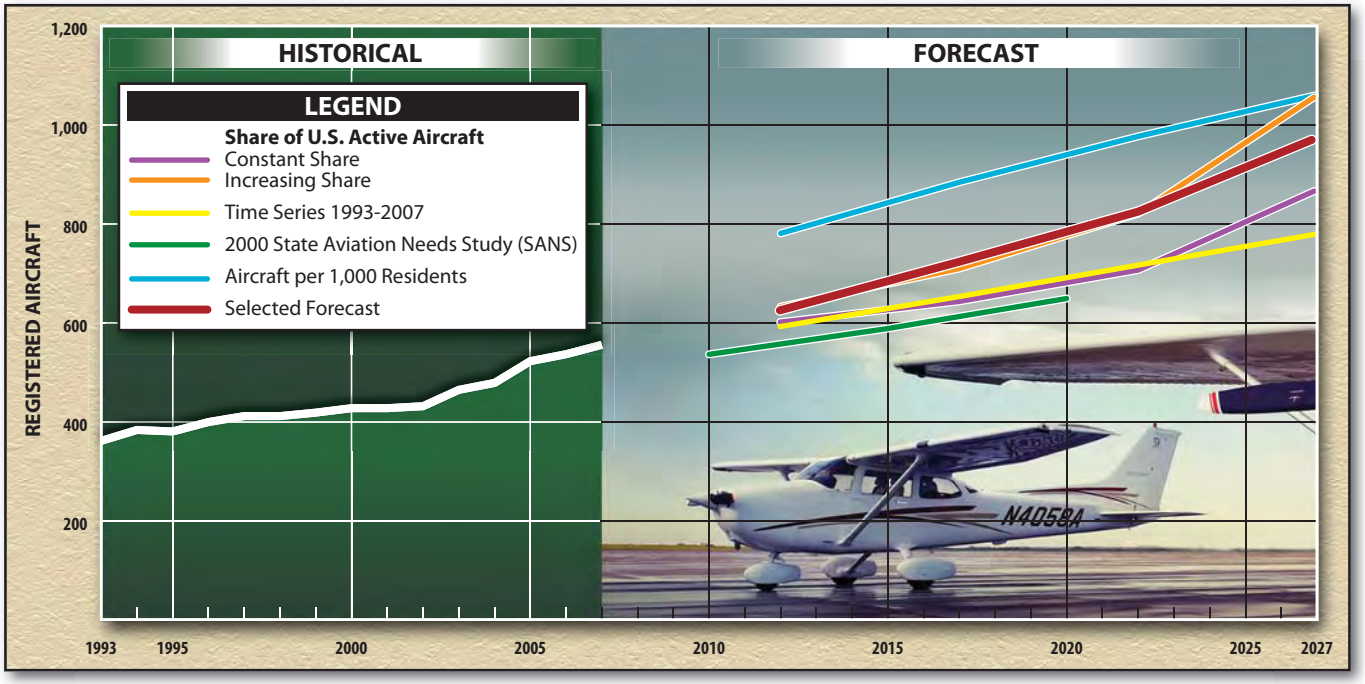


Table 2T
SHARE OF MOHAVE COUNTY REGISTERED AIRCRAFT

Year	IFP Based Aircraft	Registered Aircraft	IFP Share
Historical			
1998	60	412	14.6%
2007	49	556	8.8%
AAGR	-2.2%	3.4%	
Constant Share			
2012	79	625	12.6%
2017	91	725	12.6%
2022	104	825	12.6%
2027	123	975	12.6%
AAGR	4.7%	2.8%	
Increasing Share			
2012	98	625	15.3%
2017	131	725	18.6%
2022	178	825	22.7%
2027	240	975	27.6%
AAGR	8.3%	2.8%	

Source for Historical Based Aircraft:
2000 Master Plan, FAA TAF, Airport Records
Source for historical registered aircraft: FAA
Source for forecast registered aircraft:
Coffman Associates Analysis
Based Aircraft Forecasts: Coffman Associates Analysis
AAGR - Average Annual Growth Rate
IFP - Laughlin/Bullhead International Airport

registered aircraft and yields 123 based aircraft by 2027. An increasing market share was also developed and yields 240 based aircraft by the year 2027.

RATIO OF POPULATION

Future based aircraft potential has also been examined as a ratio of the population in the primary service area. For this analysis, the population of Bullhead City was used even though the primary service area includes Laughlin, Nevada. Separate population forecasts for Laughlin, Nevada could not be obtained for this study.

As shown in **Table 2U**, there were 1.2 based aircraft per 1,000 residents of Bullhead in 2007. This is 0.9 aircraft below the 1998 ratio of 2.1 aircraft per 1,000 residents in 2007. For planning purposes, a ratio of 1.7 based aircraft per 1,000 residents (approximate average since 1998) was projected against forecast Bullhead City population and yielded 95 based aircraft by 2027.

Table 2U
BASED AIRCRAFT FORECAST
RATIO OF BASED AIRCRAFT PER 1,000 RESIDENTS - PRIMARY SERVICE AREA

Year	IFP Based Aircraft	Bullhead Population	Based Aircraft Per 1,000 Residents
1998	60	28,535	2.1
2007	49	41,000	1.2
AAGR	-2.2%	4.1%	
Constant Share Projection			
2011	76	44,422	1.7
2016	82	48,513	1.7
2021	89	52,262	1.7
2026	95	55,596	1.7
AAGR	3.4%	1.5%	

Source for Historical Based Aircraft:
2000 Master Plan, FAA TAF, Airport Records
Source for Historical and Forecast Population:
Arizona Department of Economic Security
Source for forecast based aircraft:
Coffman Associates Analysis
AAGR - Average Annual Growth Rate
IFP - Laughlin/Bullhead International Airport

2007 TAF

As shown in **Table 2V**, the 2007 FAA TAF projected a base year total of 65 aircraft remaining constant through the year 2022.

2000 SANS

The 2000 SANS also provides a comparative forecast. As shown in **Table 2S**, the 2000 SANS projects 88 registered aircraft in 2012 and 103 registered aircraft in 2017.

BASED AIRCRAFT FORECAST SUMMARY

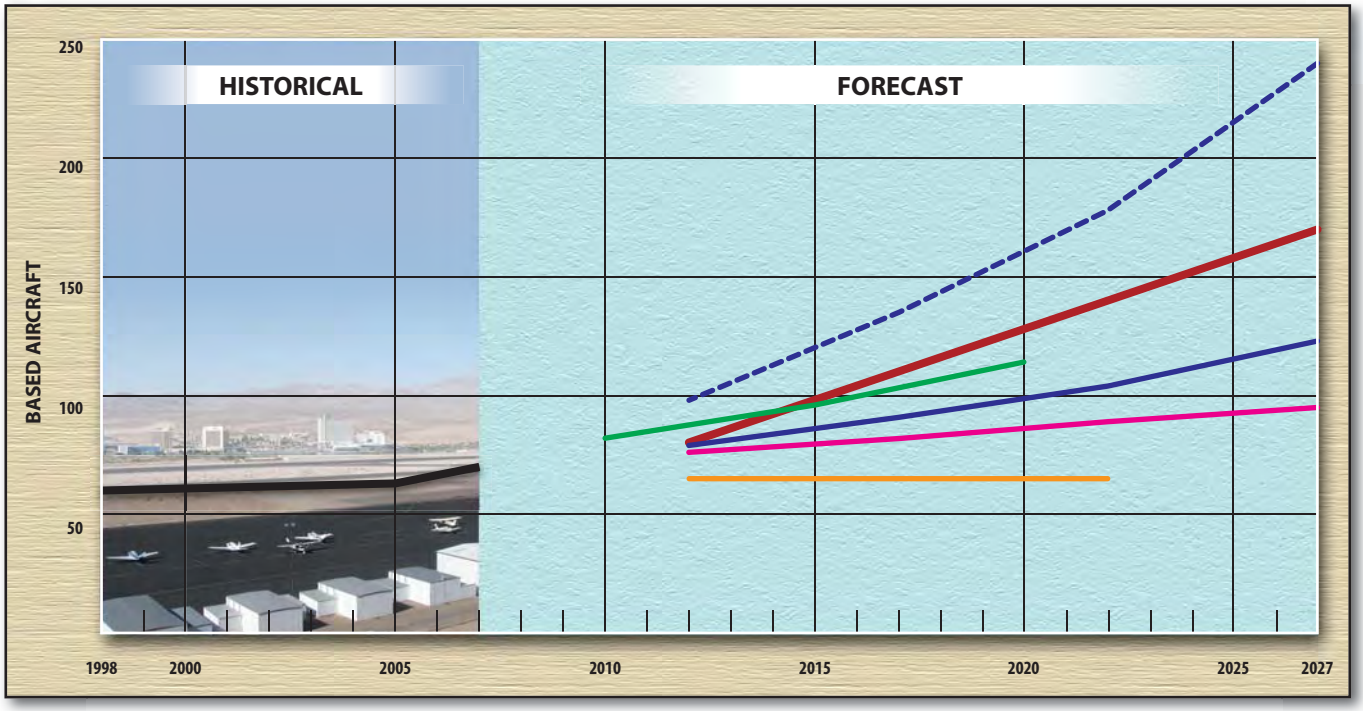
Exhibit 2H graphically presents all based aircraft forecasts. The constant ratio of based aircraft per 1,000 residents in the Bullhead City projection only results in 45 new based aircraft by 2027. This projection may underestimate growth potential. The constant share of based aircraft projection also appears to understate future growth potential as this projection results in only 53 new based aircraft. General socioeconomic growth within the service area should generate more based aircraft through

Table 2V
BASED AIRCRAFT FORECAST SUMMARY

Forecast	2007	2012	2017	2022	2027
Share of Mohave County Registered Aircraft					
Constant Share		79	91	104	123
Increasing Share		98	131	178	240
Aircraft Per 1,000 Residents					
Constant Ratio		76	82	89	95
Comparable Forecasts					
2000 State Aviation Needs Study (SANS)		88	103	NA	NA
2007 FAA Terminal Area Forecast		65	65	65	NA
Planning Forecast	49	80	110	140	170

Source: Coffman Associates Analysis
NA - Not Available
2012 & 2017 SANS extrapolated by Coffman Associates

Exhibit 2H
BASED AIRCRAFT FORECAST



the planning period. Considering this, the preferred planning forecast for based aircraft was developed that accounts for growth in the mid-range of the forecast envelope. The preferred planning forecast projects based aircraft growing at 6.4 percent annually through 2027 and adding 121 new aircraft.

BASED AIRCRAFT FLEET MIX

According to airport records, the current fleet mix consists of the following: 38 single engine aircraft, five multi-engine piston aircraft, one turboprop aircraft, two turbojet aircraft, and one helicopter. While the number of general aviation aircraft based at Laughlin/Bullhead International Airport is projected to increase, it is also important to know the fleet mix of the aircraft expected to use the airport. This will ensure the placement of proper facilities in the future.

The forecast mix of based aircraft was determined by comparing existing and forecast U.S. general aviation fleet trends to the current based aircraft fleet mix. The trend in general aviation is toward a greater percentage of larger, more sophisticated aircraft as part of the national fleet mix. This is reflected in an increasing percentage of jets and turboprop aircraft in the mix at Laughlin/Bullhead International Airport. The number of single engine aircraft is expected to increase, but will decrease as a percentage of total based aircraft following national trends. The general aviation fleet mix projections for the airport are presented in **Table 2W**.

GENERAL AVIATION OPERATIONS

The airport traffic control tower (ATCT) located on the airport collects information regarding aircraft operations (takeoffs and landings). It should be

Table 2W
TOTAL BASED AIRCRAFT FLEET MIX

Year	Total	Single Engine Piston	Multi-Engine Piston	Turboprop	Turbojet	Helicopter
Historical						
2007	49	38	5	1	2	3
Percentage Share						
2007	100.0%	77.6%	10.2%	2.0%	4.1%	6.1%
Forecast						
2012	80	65	6	2	3	4
2017	110	86	8	3	7	6
2022	140	109	9	4	11	7
2027	270	128	10	6	17	9
Percentage Share						
2012	100.0%	81.5%	7.5%	2.0%	4.0%	5.0%
2017	100.0%	79.5%	7.0%	2.5%	6.0%	5.0%
2022	100.0%	77.5%	6.5%	3.0%	8.0%	5.0%
2027	100.0%	75.5%	6.0%	3.5%	10.0%	5.0%
Change	121	90	5	5	15	6

Source: Airport Records, Coffman Associates Analysis

noted that the Laughlin/Bullhead International Airport ATCT is not open 24 hours, and as such, does not collect the true annual count. Some operations are conducted when the ATCT is closed. The previous Master Plan estimated that 20 percent of the annual operations at the airport were conducted after the ATCT was closed.

There are two types of operations at an airport: local and 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. Typically, itinerant operations increase with business and commercial uses, since these uses primarily carry people from one location to another.

Table 2X summarizes historical general aviation operations at Laughlin/Bullhead International Airport since 1999. In 1999, the ATCT transferred to the federal contract tower program and historical information began to be recorded and archived. As indicated on the table, total general aviation operations have declined 44 percent in the past nine years. Itinerant activity has declined the most, falling from 21,550 in 1999 to 13,797 in 2007.

Table 2X
HISTORICAL GENERAL AVIATION OPERATIONS

Year	Itinerant	Local	Total	% Change
1999	21,550	1,536	33,086	NA
2000	30,203	7,152	47,355	43%
2001	29,508	16,011	45,519	-4%
2002	22,545	3,306	25,851	-43%
2003	21,362	5,538	26,900	4%
2004	20,612	7,394	28,006	4%
2005	17,156	5,117	22,273	-20%
2006	16,084	5,897	21,981	-1%
2007	13,797	4,738	18,535	-16%
Change	(7,753)	(6,798)	(14,551)	
% Change	-36%	-59%	-44%	

Source: FAA Records

Local operations have declined from 11,536 in 1999 to 4,738 in 2007. Declines in general aviation activity at the airport can be partially attributed to changes in travel patterns related to accessing the entertainment and recreational opportunities in the Laughlin/Bullhead area as well aircraft use patterns. Nationally, total annual general aviation operations have been declining since 2002 as fuel prices have raised. Nationally, the FAA projects operations to increase. The FAA projects national itinerant operations to grow at 2.2 percent annually, while local operations are projected to grow at 1.7 percent annually. In order to develop updated forecasts for general aviation itinerant and local operations, Laughlin/Bullhead International Airport's share of total general aviation operations at towered airports were examined.

GENERAL AVIATION ITINERANT OPERATIONS

According to FAA records, there were a total of 13,797 general aviation itinerant operations in 2007. As shown in **Table 2Y**, this represented 0.07 percent of all general aviation itinerant operations at towered airports in the U.S. This is a decrease from the peak of 0.14 percent in 2001. As discussed above, the generally decreasing market share trend can be directly attributed to national trends in aircraft use related to an economic recession and high fuel prices over the last two years.

One market share projection was made considering a constant market share of U.S. itinerant general aviation operations at towered airports. The constant share forecast of 0.07 percent yields 20,700 annual itinerant general aviation operations by the year 2027. An increasing market share projection results in 68,000 annual operations in 2027.

These projections can be compared against the 2007 FAA TAF. The 2007 FAA TAF projects 16,820 general aviation operations at Laughlin/Bullhead International Airport by 2022. As shown on **Exhibit 2J**, the 2007 FAA TAF projection closely follows the constant market share projection discussed above and is at the low end of the forecast envelope.

Table 2Y
SHARE OF U.S. TOWER ITINERANT GENERAL AVIATION OPERATIONS

Year	IFP Itinerant	Total GA Itinerant Operations (1,000)	IFP Share
1999	21,550	23,019.4	0.09%
2000	30,203	22,844.1	0.13%
2001	29,508	21,433.3	0.14%
2002	22,545	21,450.5	0.11%
2003	21,362	20,231.3	0.11%
2004	20,612	20,007.2	0.10%
2005	17,156	19,315.1	0.09%
2006	16,084	18,751.9	0.09%
2007	13,797	19,220.1	0.07%
AAGR	-5.4%	-2.2%	
Constant Share			
2012	15,300	21,840.3	0.07%
2017	16,900	24,153.6	0.07%
2022	18,600	26,512.9	0.07%
2027	20,700	29,560.5	0.07%
AAGR	2.0%	2.2%	
Increasing Share			
2012	21,800	21,840.3	0.10%
2017	33,800	24,153.6	0.14%
2022	50,400	26,512.9	0.19%
2027	68,000	29,560.5	0.23%
AAGR	8.3%	2.2%	

Source for historical operations: FAA
Source for historical and forecast U.S. GA Operations: FAA Aerospace Forecasts. 2022 and 2027 Extrapolated by Coffman Associates
Source for forecast IFP Itinerant Operations: Coffman Associates Analysis
AAGR - Average Annual Growth Rate
IFP - Laughlin/Bullhead International Airport
GA - General Aviation

GENERAL AVIATION LOCAL OPERATIONS

There were a total of 4,738 general aviation itinerant operations at the airport in 2007. As shown in **Table 2Z**, this represented 0.03 percent of all general

Exhibit 2J
ITINERANT GENERAL AVIATION OPERATIONS

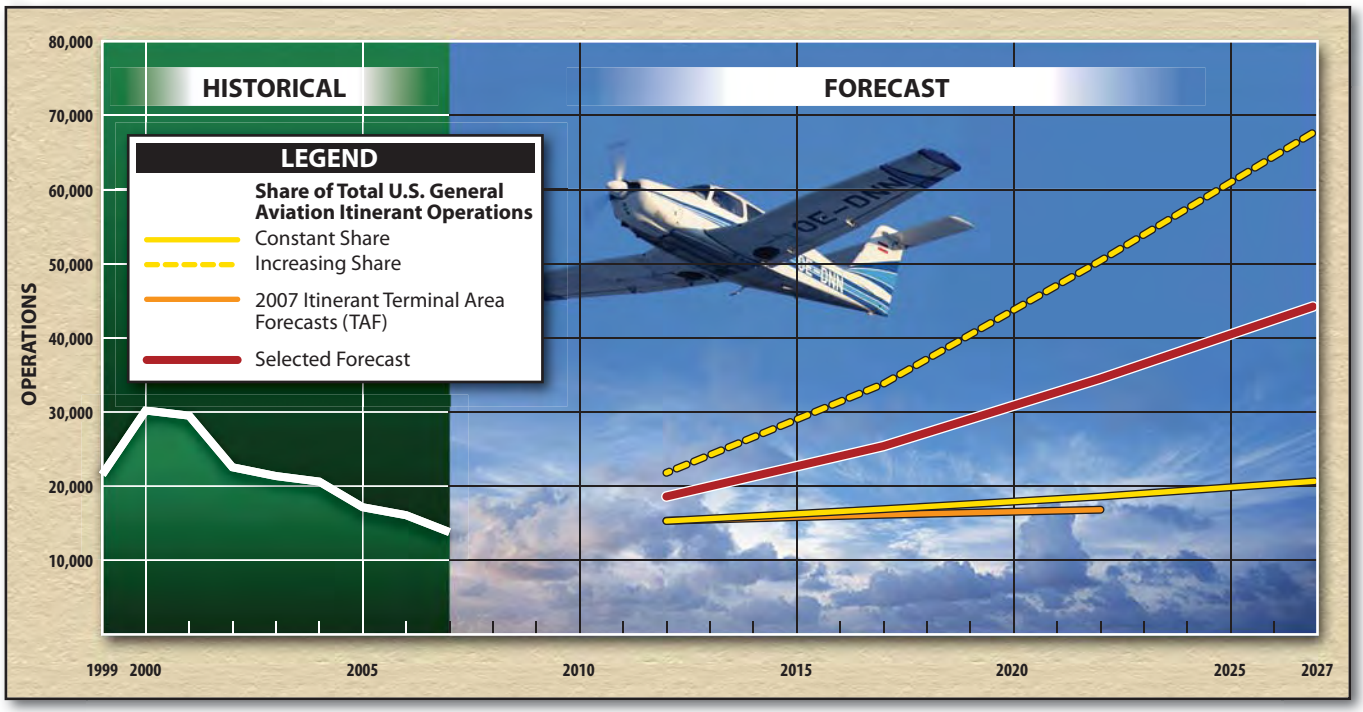


Table 2Z
SHARE OF U.S. TOWER LOCAL GENERAL AVIATION OPERATIONS

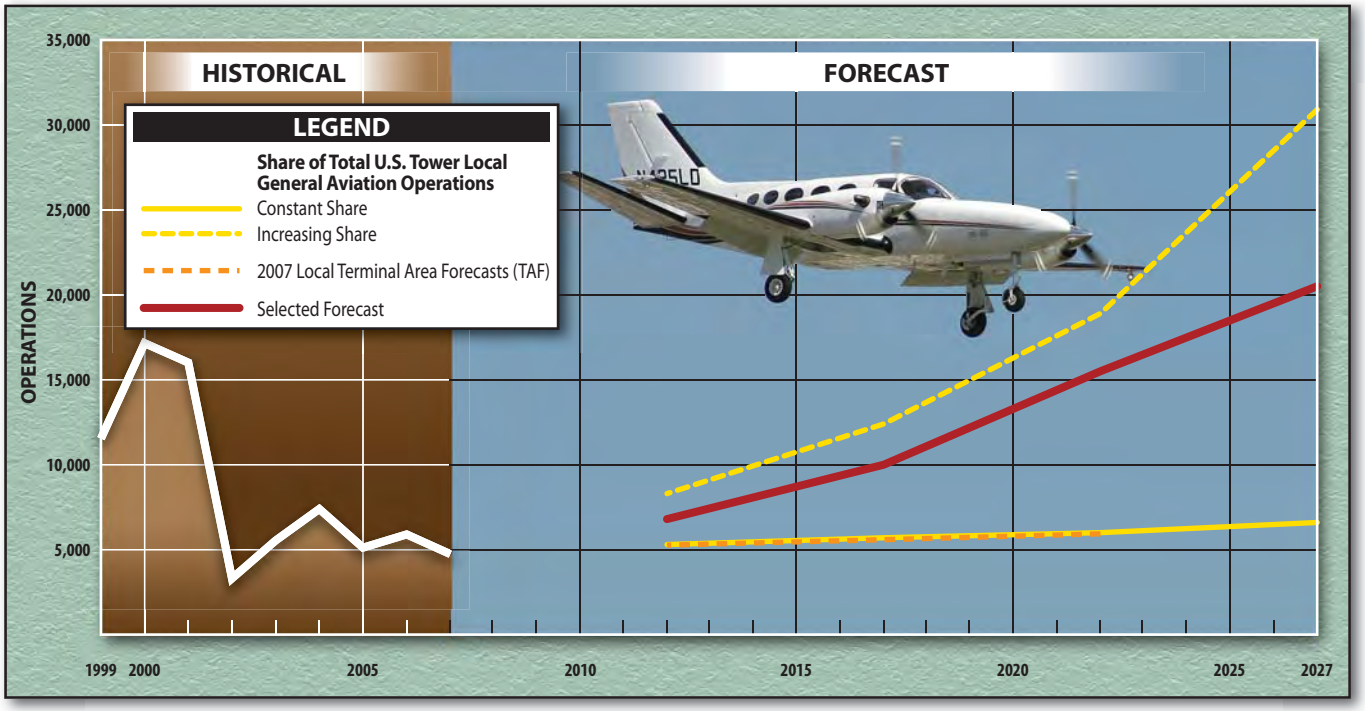
Year	IFP Local	Total GA Local Operations (1,000)	IFP Share
1999	11,536	16,908.2	0.07%
2000	17,152	17,034.4	0.10%
2001	16,011	16,193.7	0.10%
2002	3,306	16,172.8	0.02%
2003	5,538	15,292.1	0.04%
2004	7,394	14,960.4	0.05%
2005	5,117	14,845.9	0.03%
2006	5,897	14,378.9	0.04%
2007	4,738	14,833.3	0.03%
AAGR	-10.5%	-1.6%	
Constant Share			
2012	5,300	16,552.9	0.03%
2017	5,700	17,715.8	0.03%
2022	6,000	18,925.1	0.03%
2027	6,600	20,589.4	0.03%
AAGR	1.7%	1.7%	
Increasing Share			
2012	8,300	16,552.9	0.05%
2017	12,400	17,715.8	0.07%
2022	18,900	18,925.1	0.10%
2027	30,900	20,589.4	0.15%
AAGR	9.8%	1.7%	

Source for historical operations: FAA
Source for historical and forecast US GA Operations: FAA Aerospace Forecasts. 2022 and 2027 Extrapolated by Coffman Associates
Source for forecast IFP Itinerant Operations: Coffman Associates Analysis
AAGR - Average Annual Growth Rate
IFP - Laughlin/Bullhead International Airport
GA - General Aviation

aviation itinerant operations at towered airports in the U.S. This is a decrease from the peak of 0.10 percent in 2001. This generally decreasing market share trend can be directly attributed to a reduction in aircraft training at the airport.

Local general aviation operations have been examined as a share of U.S. local general aviation operations in the U.S. Maintaining the 2007 share of 0.03 percent constant through 2027 yields 6,600 operations by the end of the planning period. An

Exhibit 2K
LOCAL GENERAL AVIATION OPERATIONS



increasing market share projection results in 30,900 annual operations in 2027.

These projections can be compared against the 2007 FAA TAF. The 2007 FAA TAF projects 5,930 general aviation operations at Laughlin/Bullhead International Airport by 2022. The 2007 FAA TAF projection falls below the constant market share projection discussed above. All local general aviation operation forecasts are shown on **Exhibit 2K**.

TOTAL GENERAL AVIATION OPERATIONS

Table 2AA summarizes all the local and itinerant general aviation operations forecasts for Laughlin/Bullhead International Airport. **Exhibit 2L** graphically depicts the total general aviation operations which are the sum of total itinerant and total local operations.

The preferred planning forecast for itinerant general aviation operations lays mid-range between the constant share of U.S. itinerant operations forecast and the increasing share of U.S. itinerant operations. This forecast projects general aviation operations growing at 6.0 percent annually through the planning period.

The preferred planning forecast for general aviation operations provides for slightly stronger growth than the preferred planning forecast for itinerant general aviation operations. While the airport presently does not experience many training operations, the preferred planning forecast should account for growing general aviation operations. As based aircraft levels grow, the airport should experience additional local operations for recurrent and advanced training. This forecast should also account for the establishment of a formal training program at the airport. The preferred planning forecast for local general aviation operations projects local operations growing at 7.6 percent annually.

Overall, total general aviation operations are projected to grow at 6.5 percent annually. While itinerant operations presently account for approximately 75 percent of total annual operations,

Table 2AA
GENERAL AVIATION OPERATIONS FORECAST SUMMARY

Forecast	2007	2012	2017	2022	2027
Itinerant					
Share of U.S. Itinerant General Aviation Operations					
Constant Share		15,300	16,900	18,600	20,700
Increasing Share		21,800	33,800	50,400	68,000
2007 FAA Terminal Area Forecast (TAF)		15,335	16,138	16,820	NA
Planning Forecast (Tower Count)	13,797	18,600	25,400	34,500	44,400
Operations after Airport Traffic Control Tower (ATCT) is closed	2,800	3,700	5,100	6,900	8,900
Total Itinerant Operations	**16,597**	**22,300**	**30,500**	**41,400**	**53,300**
Local					
Share of U.S. Local General Aviation Operations					
Constant Share		5,300	5,700	6,000	6,600
Increasing Share		8,300	12,400	18,900	30,900
2007 FAA Terminal Area Forecast (TAF)		5,264	5,586	5,930	NA
Planning Forecast (Tower Count)	4,738	6,800	10,000	15,500	20,500
Operations after Airport Traffic Control Tower (ATCT) is closed	900	1,400	2,000	3,100	4,100
Total Local Operations	**5,638**	**8,200**	**12,000**	**18,600**	**24,600**
Total Operations					
Share of U.S. General Aviation Operations					
Constant Share		20,600	22,600	24,600	27,300
Increasing Share		30,100	46,200	69,300	98,900
2007 FAA Terminal Area Forecast (TAF)		20,599	21,724	22,750	N/A
2000 State Aviation Needs Study (SANS)		70,360	82,897	N/A	N/A
Planning Forecast (Tower Count)	18,535	25,400	35,400	50,000	64,900
Operations after Airport Traffic Control Tower (ATCT) is closed	3,700	5,100	7,100	10,000	13,000
Total Operations	**22,235**	**30,500**	**42,500**	**60,000**	**77,900**
Percent Itinerant	**75%**	**73%**	**72%**	**69%**	**68%**
Percent Local	**25%**	**27%**	**28%**	**31%**	**32%**

Source: Coffman Associates Analysis

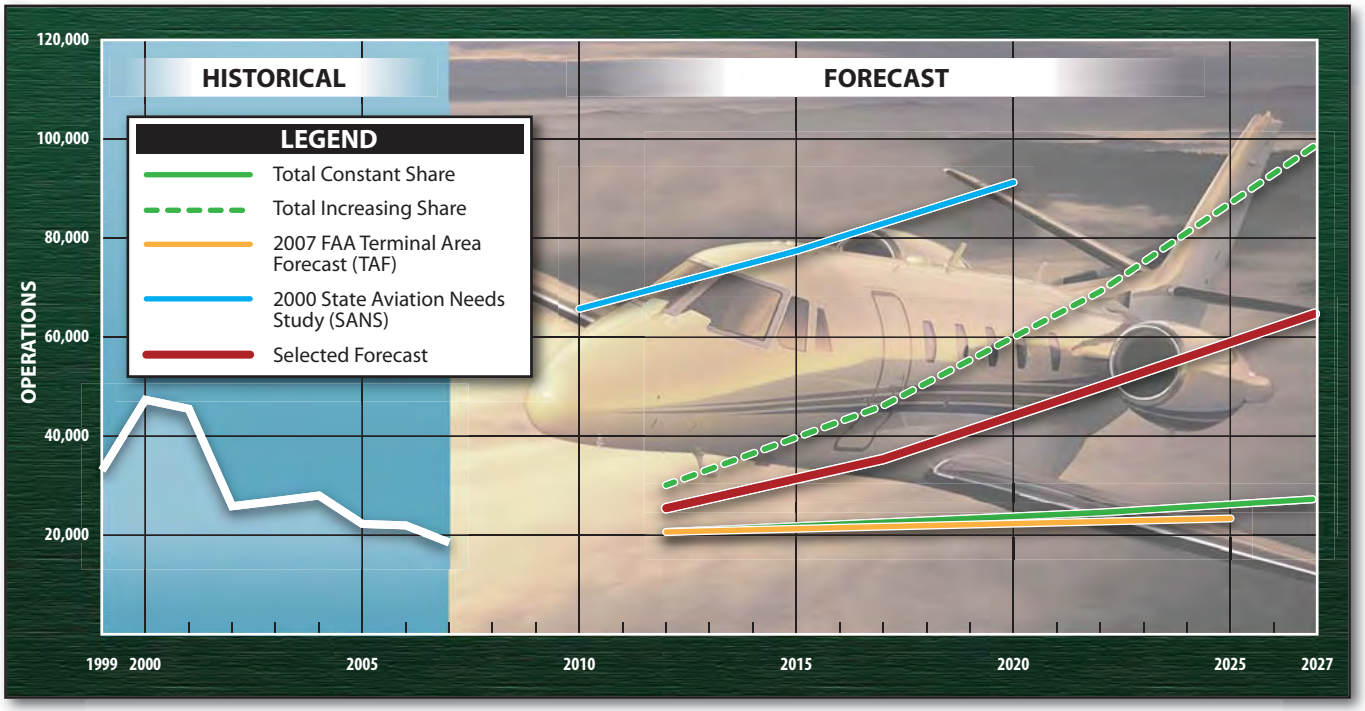
the projected growth in local operations will result in itinerant operations declining to 68 percent of total general aviation operations by 2027.

As mentioned previously, the ATCT is closed for a portion of each day. This means that the ATCT does not record all operations at the airport. The preferred itinerant and preferred local operations planning forecasts have been increased by 20 percent to account for the periods when the ATCT is closed. These adjustments are shown in **Table 2AA**.

OTHER OPERATIONS

In addition to general aviation operations, the ATCT further classifies itinerant and local operations at the airport as air carrier, air taxi, and military. Air carrier operations are those conducted by large airline and air cargo aircraft. Air taxi operations generally include those conducted by regional airlines, regional air cargo operators, general aviation aircraft filing flight plans under 14 CFR Part 135, and sometimes fractional operators. The analysis above

Exhibit 2L
TOTAL GENERAL AVIATION OPERATIONS



in the Commercial Service section has accounted for air carrier operations. Air taxi operations and military operations are discussed below.

AIR TAXI OPERATIONS

Since air cargo operations were projected separately, these operations have been removed from the total air taxi operations registered by the ATCT for this analysis. The remaining air taxi operations are those operations conducted by 14 CFR Part 135 operators and fractional aircraft operators. As shown in **Table 2BB**, air taxi operations grew from approximately 2,091 in 2006 to 2,139 in 2007. These totals assume a 20 percent increase for operations conducted after the ATCT is closed. Future air taxi operations have been projected to grow at 1.9 percent annually, consistent with national forecasts. This results in air taxi operations growing to 3,100 by 2027.

MILITARY OPERATIONS

Projecting future military utilization of an airport is particularly difficult since local missions may change with little notice. However, existing operations and aircraft mix may be confirmed for their impact on facility planning. Presently, the airport experiences very little military activity. In 2007, only 326 military operations were recorded by the ATCT. Since 1999, the airport has averaged only 360 annual military operations.

Table 2BB
AIR TAXI OPERATIONS

Year	Air Taxi
Historical	
2006	2,091
2007	2,139
Forecasts	
2012	2,500
2017	2,700
2022	2,900
2027	3,100
AAGR	1.9%

Source: Coffman Associates Analysis, FAA Records
Note: Historical operations adjusted 20% to account for operations conducted after ATCT is closed.
AAGR - Average Annual Growth Rate

It is difficult to predict the pattern of military operations due to the ever-changing missions of military forces; however, total military operations at the airport have remained relatively constant. Therefore, military operations have been projected at 300 operations annually with 200 being attributed to itinerant activity and 100 being attributed to local activity.

OPERATIONAL MIX

The number and type of aircraft operating at the airport and how this might change over time is important to understand. This type of information is used in determining future noise emissions for the Master Plan. An estimate of the existing operational mix is provided in **Table 2CC**. This estimate was derived from a review of filed instrument flight plans to the airport and landing fee reports maintained by the MCAA. This analysis concluded that fixed-wing aircraft represented approximately 97.5 percent of the total operations at the airport, while helicopters represented the remaining 2.5 percent. Single engine piston aircraft represent the majority of fixed-wing aircraft operations.

A forecast of the operational mix is also shown in **Table 2CC**. This projection assumes that fixed-wing aircraft will grow in number and percentage of the total mix through the planning period. This is consistent with projected based aircraft fleet mix changes for Laughlin/Bullhead International Airport and national trends showing stronger growth rates for the number of active fixed-wing aircraft versus rotorcraft.

Table 2CC
OPERATIONAL MIX

Aircraft Type	Annual Operations	% of Mix
2007		
Single Engine Piston	17,896	64.6%
Multi-Engine Piston	5,421	19.6%
Turboprop	1,282	4.6%
Turbojet	2,414	8.7%
Helicopter	681	2.5%
Total	**27,694**	**100.0%**
2012		
Single Engine Piston	24,400	61.5%
Multi-Engine Piston	6,800	17.1%
Turboprop	1,500	3.8%
Turbojet	6,000	15.1%
Helicopter	1,000	2.5%
Total	**39,700**	**100.0%**
2017		
Single Engine Piston	34,200	63.2%
Multi-Engine Piston	8,900	16.5%
Turboprop	1,700	3.1%
Turbojet	8,100	15.0%
Helicopter	1,200	2.2%
Total	**54,100**	**100.0%**
2022		
Single Engine Piston	48,200	64.6%
Multi-Engine Piston	11,900	16.0%
Turboprop	2,000	2.7%
Turbojet	11,000	14.7%
Helicopter	1,500	2.0%
Total	**74,600**	**100.0%**
2027		
Single Engine Piston	62,700	65.4%
Multi-Engine Piston	14,900	15.5%
Turboprop	2,400	2.5%
Turbojet	14,000	14.6%
Helicopter	1,900	2.0%
Total	**95,900**	**100.0%**

Source: Coffman Associates Analysis

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 activity occurs.
- 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 PEAKING CHARACTERISTICS

Since 2001, the peak month for passenger enplanements has always occurred in March. Over this period, the peak enplanement month has ranged from 11.9 percent to 16.3 percent of total annual enplanements, or an average of 14.5 percent of annual enplanements. Typically, the peak month at commercial service airports averages approximately 12 percent of total annual enplanements. The peak month percentage at Laughlin/Bullhead International Airport is higher due to the gaming/resort destination of the area and time of year as activity declines over the warmer summer months at the airport. For planning purposes, the peak month for passenger enplanements is projected to decline to 12 percent of total annual enplanements as regular air service is initiated at the airport.

The design day was calculated by dividing peak month figures by 31. Ideally, hourly enplanements should be used to examine changes in peak hour passengers as a percentage of design day activity. The "design hour" passengers were estimated based on current schedules which typically have two departing aircraft during peak periods. Assuming the type of aircraft currently used at the airport and applying the current BLF of 78 percent results in 233 passengers during the peak hour, or approximately 51 percent of design day activity. This percentage is projected to decline as regular air service for the airport is projected to utilize lower seating capacity regional jets and have more daily flights to disperse the peak periods. Airline operations peak periods were determined by assuming 12 percent of total annual operations would occur in the peak month and that the design hour operations represent 28 percent of design day activity.

General Aviation Peak Periods

According to FAA ATCT records, the peak month for general aviation itinerant operations represents approximately 11 to 12 percent of total general aviation itinerant operations. Forecasts of peak activity have been developed by applying 12 percent to the forecasts of annual itinerant operations. As previously mentioned, design day operations were calculated by dividing the total number of operations in the peak month by the number of days in the month. The design hour was estimated at 20 percent of the design day operations. Busy day operations were estimated at 25 percent higher than design day operations.

Peaking characteristics for Laughlin/Bullhead International Airport are summarized in **Table 2DD**.

ANNUAL INSTRUMENT APPROACHES (AIAs)

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 Laughlin/Bullhead International Airport, aircraft must land at the airport after following one of the published instrument approach procedures to Runway 34 and then properly closing their flight plan. 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 AIA is not counted in the statistics. It should be noted that practice or training approaches do not count as annual AIAs.

Table 2DD
PEAK PERIOD FORECASTS

		Forecasts			
	2007	2012	2017	2022	2027
Enplaned Passengers					
Annual	113,796	145,000	200,000	275,000	375,000
Peak Month	14,148	17,400	24,000	33,000	45,000
Design Day	456	561	774	1,065	1,452
Design Hour	233	286	271	266	247
Airline Operations					
Annual	1,944	5,200	7,200	9,800	12,600
Peak Month	226	624	864	1,176	1,512
Design Day	7	20	28	38	49
Design Hour	2	6	8	11	14
General Aviation Itinerant Operations					
Annual	16,597	22,300	30,500	41,400	53,300
Peak Month	1,826	2,676	3,660	4,968	6,396
Design Day	59	86	118	160	206
Busy Day	74	108	148	200	258
Design Hour	12	17	24	32	41

Source: Coffman Associates Analysis

Table 2EE
ACTUAL INSTRUMENT APPROACHES FORECAST

		Forecasts			
	2007	2010	2015	2020	2025
Annual Itinerant Operations	21,948	31,400	42,000	55,900	71,200
Actual Instrument Approaches	NA	188	252	335	427

Source: Coffman Associates Analysis

Historical AIA information is not available for Laughlin/Bullhead International Airport. This does not necessarily indicate that this approach is not used. The FAA does not make records available for each airport.

The presence of good flying weather indicates that the weather conditions only occasionally go below the IFR approach minimums. Therefore, actual instrument approach numbers are low. For planning purposes, future AIAs have been projected at 0.6 percent of future itinerant operations due to the prevalence of good flying weather at the airport. This forecast is presented in **Table 2EE**.

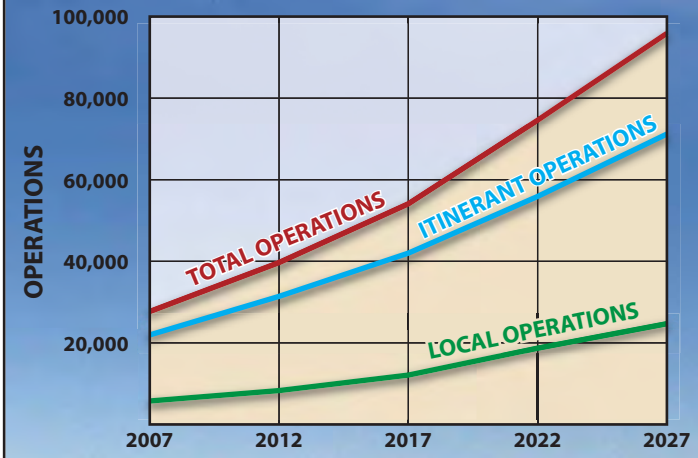
SUMMARY

This chapter has provided forecasts for each sector of aviation demand anticipated over the planning period. **Exhibit 2M** presents a summary of the aviation forecasts developed for Laughlin/Bullhead International 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. This is considered a preliminary draft until submitted and approved by the FAA.

Exhibit 2M
FORECAST SUMMARY

	BASE YEAR	FORECAST			
	2007	2012	2017	2022	2027
Annual Enplaned Passengers	113,796	145,000	200,000	275,000	3 75,000
Annual Enplaned Cargo (pounds)	1,278,400	1,530,000	1,840,000	2,210,000	2 ,640,000
Annual Operations					
Itinerant					
Air Carrier	1,944	5,200	7,200	9,800	12,600
Air Cargo	1,052	1,200	1,400	1,600	2,000
Air Taxi	2,139	2,500	2,700	2,900	3,100
General Aviation	16,597	22,300	30,500	41,400	53,300
Military	216	200	200	200	200
Total Itinerant Operations	**21,948**	**31,400**	**42,000**	**55,900**	**71,200**
Local					
General Aviation	5,638	8,200	12,000	18,600	24,600
Military	109	100	100	100	100
Total Local Operations	**5,747**	**8,300**	**12,100**	**18,700**	**24,700**
Total Annual Operations	**27,695**	**39,700**	**54,100**	**74,600**	**95,900**
Based Aircraft Fleet Mix					
Single Engine Piston	38	65	87	1 09	128
Multi-Enigne Piston	5	6	8	9	10
Turboprop	1	2	3	4	6
Turbojet	2	3	7	11	17
Helicopter	3	4	6	7	9
Total Based Aircraft	**49**	**80**	**110**	**140**	**170**
Actual Instrument Approaches	NA	188	252	335	427

OPERATIONS FORECAST



BASED AIRCRAFT FORECAST