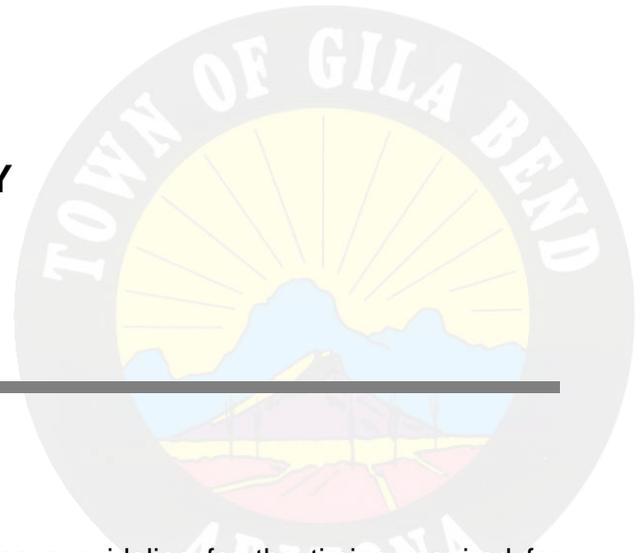


SECTION 2: FORECASTS OF AVIATION ACTIVITY

GILA BEND MUNICIPAL AIRPORT AIRPORT MASTER PLAN 2003



INTRODUCTION

Forecasts of aviation activity serve as a guideline for the timing required for implementation of airport improvement programs. While such information is essential to successful comprehensive airport planning, it is very important to recognize that forecasts are only approximations of future activity, based upon historical data and from the standpoint of present situations. They therefore must be used with careful consideration, as they may lose their validity through the passage of time. For this reason, an ongoing program of examination of local airport needs, as well as national and regional trends, is recommended and encouraged in order to promote the orderly development of the Gila Bend Municipal Airport.

Air Traffic Control personnel maintain records of aircraft operations at towered airports. At airports which are not served by air traffic control towers, estimates of existing aviation activity are necessary in order to form a basis for the development of realistic forecast projections. These estimates are usually based upon a review of available historical data, as well as observations of current activity, and contacts with airport users.

Following the development of the estimated current demand, projections are made based upon established growth rates, area demographics, industry trends and other important indicators. Forecasts are prepared for the Initial Term (five-year), the Intermediate Term (ten-year) and the Ultimate Term (fifteen and twenty-year) time frames. Having forecasts within these time frames will allow the construction of airport improvements to be timed to meet demand, but not so early as to remain idle for an unreasonable length of time.

Types of Operations:

There are four general types of aircraft operations which are considered in the master planning process. These are termed local, based, itinerant, and transient. They are defined as follows:

- C **Local operations** are defined as aircraft movements (departures or arrivals) for the purpose of training, pilot currency or pleasure flying, within the immediate area of the local airport. These operations typically consist of touch-and-go operations, practice instrument approaches, flights to and within local practice areas, and pleasure flights which originate and terminate at the airport under study.
- C **Itinerant operations** are defined as arrivals and departures other than local operations, as described above. This type of operation is closely tied to local demographic indicators, such as local industry and business use of aircraft and usage of the facility for recreational purposes.
- C **Based aircraft operations** are defined as the total operations made by aircraft based at the airport under study, with no attempt to classify the operations as to purpose.
- C **Transient operations** are defined as the total operations made by aircraft other than those based at the airport under study. These operations typically consist of business or pleasure flights originating at other airports, with termination or a stopover at the study airport.

REVIEW OF APPLICABLE PRIOR PLANNING STUDIES

Over the past several years there have been other airport and airport systems planning studies conducted that either directly or indirectly affect the Gila Bend Municipal Airport.

These include the following:

- C the FAA Terminal Area Forecasts or TAF (as updated on the FAA web site, February, 2002);
- C the 1995 Arizona State Aviation Needs Study (Bucher, Willis & Ratliff - November, 1995);
- C the Gila Bend Municipal Airport Master Plan Report - 1981 (Ellis Murphy, Inc. - 1981);
- C the Gila Bend Municipal Airport Master Plan Update 1995-2015 (Gannett Fleming, Inc. - June, 1996).

Section 2: Forecasts of Aviation Activity

These documents are summarized below.

FAA Terminal Area Forecasts (TAF):

The FAA Terminal Area Forecasts is an interactive Internet database that includes historical and projected aviation activity information for U.S. airports. The database includes the following information for the Gila Bend Municipal Airport:

FAA Terminal Area Forecast (TAF) Gila Bend Municipal Airport 1988 - 2015

YEAR	ANNUAL OPERATIONS			BASED AIRCRAFT
	ITINERANT	LOCAL	TOTAL	
1990	3,050	1,500	4,550	0
1995	3,050	1,500	4,550	0
2000	3,050	1,500	4,550	2
2002	2,990	1,470	4,460	2
2005	2,990	1,470	4,460	2
2010	2,990	1,470	4,460	2
2015	2,990	1,470	4,460	2

Source: FAA TAF Web Site Accessed (September 10, 2003)

The 1995 Arizona State Aviation Needs Study (SANS):

The 1995 Arizona State Aviation Needs Study (SANS) includes information on the Gila Bend Municipal Airport, including inventories of based aircraft, estimates of current aeronautical activity, and forecasts of future activity.

The SANS indicates that there were 10 aircraft based at Gila Bend in 1995, and projects that this will increase to 17 by 2015. The number of Maricopa County based aircraft were estimated at 3,094 in 1995 and forecast to increase to 3,777 by the year 2015, an average increase of 1.01% per year. In the projections, Gila Bend's share of the County's based aircraft varies from about 0.32% to 0.45%, as illustrated below.

**SANS Forecast of Based Aircraft 1995-2015
Maricopa County and Gila Bend Municipal Airport**

LOCATION	NUMBER OF BASED AIRCRAFT				
	1995	2000	2005	2010	2015
Maricopa County	3,094	3,185	3,358	3,557	3,777
Gila Bend Airport	10	11	13	15	17
Gila Bend's Share of County Based Aircraft	0.32%	0.35%	0.39%	0.42%	0.45%

Source: 1995 Arizona State Aviation Needs Study (SANS)
(calculations by Gannett Fleming)

The SANS estimated 12,800 total annual operations at Gila Bend in 1995, and projected that this will increase to 16,300 operations by 2015. Annual operations at all Maricopa County airports were forecast to increase at an annual rate of 1.70% through the planning period, from 1.7 million to 2.3 million annual operations. Gila Bend's share of the aircraft activity in Maricopa County is illustrated in the following table.

**SANS Forecast of Annual General Aviation Operations 1995-2015
Maricopa County and Gila Bend Municipal Airport**

LOCATION	TOTAL ANNUAL G.A. OPERATIONS				
	1995	2000	2005	2010	2015
Maricopa County	1,657,066	1,805,358	1,978,500	2,124,200	2,321,400
Gila Bend Airport	12,800	13,600	14,500	15,400	16,300
Gila Bend's Share of County Based Aircraft	0.77%	0.75%	0.73%	0.73%	0.70%

Source: 1995 Arizona State Aviation Needs Study (SANS)
(calculations by Gannett Fleming)

Section 2: Forecasts of Aviation Activity

An inventory and forecasts of licensed general aviation pilots residing in Arizona and in Maricopa County is also included in the SANS. The table below contains a summary of the SANS information. As is evidenced in the table, the SANS suggests that aeronautical activity in Maricopa County will continue to grow at a greater pace than the rest of the state.

**SANS Historic and Forecast Licensed Pilots
Arizona and Maricopa County**

YEAR	LICENSED PILOTS		COUNTY SHARE
	ARIZONA	MARICOPA COUNTY	
1980 (Historical)	7,370	4,411	59.85%
1990 (Historical)	7,436	4,564	61.38%
1995	8,146	4,997	61.34%
2000	9,311	5,750	61.75%
2005	10,491	6,511	62.06%
2010	11,704	7,298	62.35%
2015	12,923	8,104	62.71%
Trend (%/year)	1.54%	1.76%	

Source: 1995 Arizona State Aviation Needs Study (SANS)
(calculations by Gannett Fleming)

Gila Bend Municipal Airport Master Plan Report - 1981:

The 1981 Gila Bend Municipal Airport Master Plan included forecasts of based aircraft and annual operations for the 1981 through 2001 planning period. These projections are presented below for reference purposes.

**Forecast of Based Aircraft 1981-2001
Gila Bend Municipal Airport Master Plan Report - 1981**

LOCATION	NUMBER OF BASED AIRCRAFT				
	1981	1986	1991	1996	2001
Maricopa County	3,129	3,477	3,980	4,785	5,865
Gila Bend Airport	14	16	17	19	21
Gila Bend's Share of County Based Aircraft	0.45%	0.46%	0.43%	0.40%	0.36%

Source: Gila Bend Municipal Airport Master Plan Report - 1981
(calculations by Gannett Fleming)

**Forecast of Operations 1981-2001
Gila Bend Municipal Airport Master Plan Report - 1981**

TYPE	ANNUAL OPERATIONS AT GILA BEND				
	1981	1986	1991	1996	2001
Itinerant Operations	4,200	4,800	5,100	5,700	6,300
Local Operations	3,500	4,000	4,250	4,750	5,250
TOTAL OPERATIONS	7,700	8,800	9,350	10,450	11,550

Source: Gila Bend Municipal Airport Master Plan Report - 1981
(calculations by Gannett Fleming)

Gila Bend Municipal Airport Master Plan Update 1995-2015:

The 1995 update of the Airport Master Plan also included forecasts of aviation activity at Gila Bend. These are presented in the following table.

**Forecast of Based Aircraft and Annual Operations
Gila Bend Municipal Airport Master Plan Update 1995-2015**

	PLANNING YEAR				
	1995	2000	2005	2010	2015
Based Aircraft	3	7	11	16	21
Itinerant Operations	1,070	2,500	3,930	5,710	7,500
Local Operations	460	1,070	1,680	2,450	3,210
TOTAL OPERATIONS	1,530	3,570	5,610	8,160	10,710

Source: Gila Bend Municipal Airport Master Plan Update 1995-2015
(calculations by Gannett Fleming)

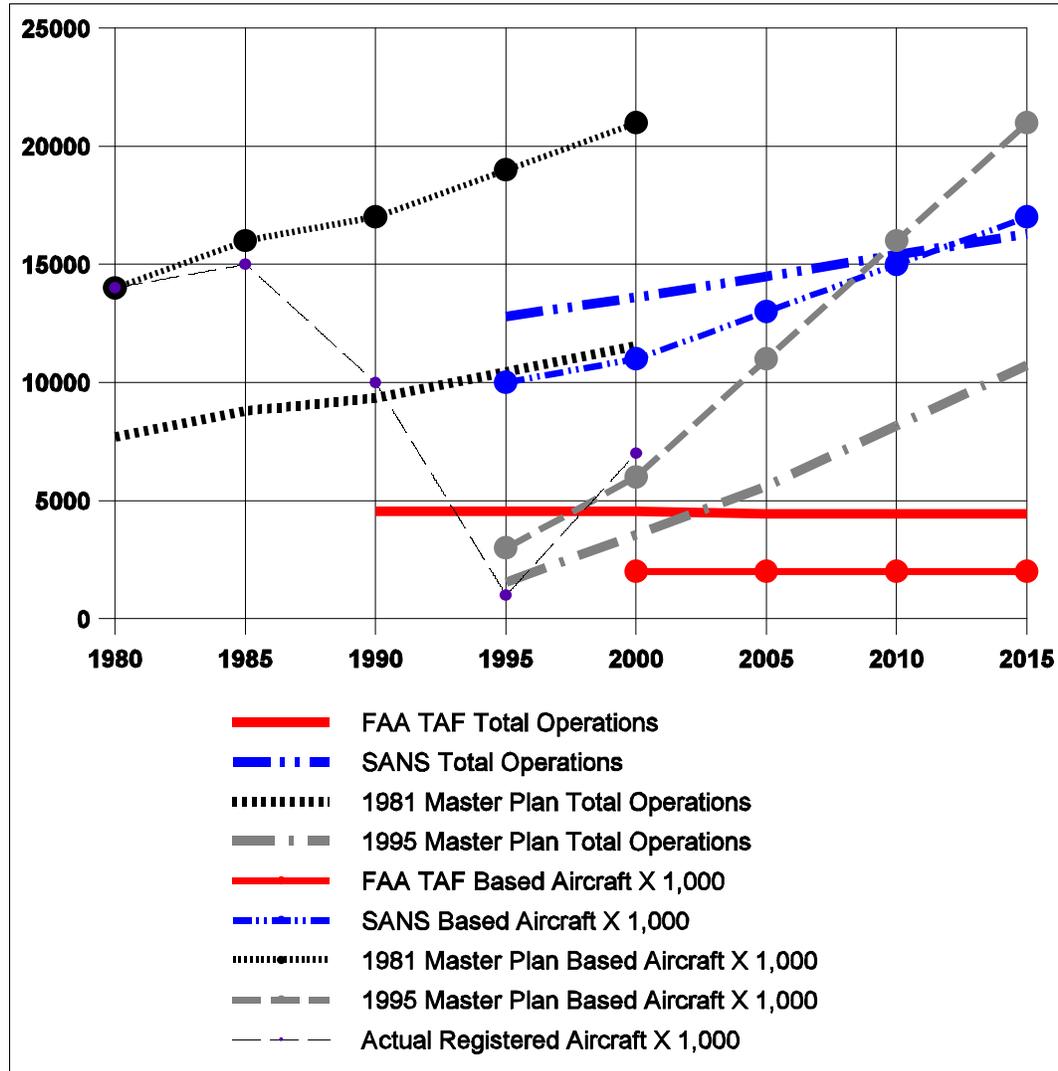
Actual Registered Aircraft in the Gila Bend Area:

The FAA Aircraft Registry indicates that there are 8 aircraft currently registered to owners who reside in the 85337 Zip Code area. It is not known where these aircraft are actually based, or if in fact they still belong to the owners of record contained on the FAA Registry. There is only 1 aircraft currently parked full time at the Gila Bend Municipal Airport.

Summary and Comparison of Prior Projections:

The chart on the following page illustrates the various prior forecasting efforts for the Gila Bend Municipal Airport.

**Comparison of Prior Projections
Gila Bend Municipal Airport
Based Aircraft and Total Annual Operations**



DETERMINATION OF ESTIMATED EXISTING ACTIVITY AT GILA BEND

Market Share of Based Aircraft (Aircraft to Population Ratios):

The FAA Aircraft Registry indicates that there are eight aircraft registered to owners who reside within the Gila Bend Zip Code area (85337). However, there is currently only one aircraft based (regularly parked) at the airport. The eight registered aircraft represent approximately 0.25% of the total estimated number of aircraft in Maricopa County (3,254). The single aircraft that is actually parked at Gila Bend represents 0.03% of the County total. The average of these two percentages is 0.16%.

The estimated 2003 population of the Gila Bend Municipal Airport service area (about 2,200 people) represents only about 0.07% of the estimated 2003 population of Maricopa County. The aircraft per population ratios, based on the various data presented in Section 1, are estimated as follows:

**Estimated Aircraft/Population Ratios
Maricopa County and Gila Bend Municipal Airport**

Data	2003 Estimated Population	2003 Estimated No. of Aircraft	Aircraft/Population Ratio
SANS Maricopa County Aircraft/DES County Population	3,175,100	3,254	0.0010
FAA Gila Bend Registered Aircraft/Gila Bend Service Population	2,200	8	0.0036
Actual Based Aircraft/Gila Bend Service Population	2,200	1	0.0005

It is highly likely that the FAA Aircraft Registry data is not up to date, and that some of the aircraft listed are actually not registered to the owners listed. It is a fairly common occurrence when aircraft are destroyed or parted out, that the FAA registration is not canceled by the last owner or the insurance companies.

With this in mind, it is a fair assumption that the number of based aircraft at Gila

Section 2: Forecasts of Aviation Activity

Bend in 2003 should be expected to be within the range of aircraft/population ratios presented above; probably somewhere near the Maricopa County ratio of 0.0010, and certainly not exceeding 0.0036, and probably somewhere near 0.16% of the total aircraft in the County (5 aircraft).

Market Share of Aircraft Operations:

The table on page 2-8 illustrates the wide range of forecasts of operations that resulted from the various prior independent planning studies. The estimated total annual operations at Gila Bend vary from just under 5,000 (FAA TAF and 1995 Master Plan projections), to approximately 13,000 (SANS projections). The SANS (the most current prior work) estimated that there were approximately 1,657,066 total annual operations in Maricopa County and 12,800 total annual operations at Gila Bend Municipal Airport during 1995. According to the SANS, operations at Gila Bend represented about 0.77% of total Maricopa County activity.

Flight Training Activity at Gila Bend:

As a part of this planning study, a list of active Arizona Pilot Training Schools was compiled. These institutions were contacted and requested to provide information on the type and number of training operations conducted at Gila Bend. A total of 14 institutions were contacted by Fax and/or e-mail. Responses were received from five of the schools contacted, including the most active, Sabena Airline Training Center who operate from Scottsdale Municipal Airport. The results are as follows:

Gila Bend Municipal Airport Results of Survey of Arizona Pilot Training Schools

January, 2003

Flight School	Annual Operations		Type of Operations - 2003		
	2003	Future	Singles	Twins	Jets
Sabena Airline Training Ctr	1,000	1,600	900	100	0
Chandler Air Service	30	60	30	0	0
Sunbird Flight Services	100	100	95	5	0
Tyconic, Inc.	100	100	100	0	0
Leading Edge Aviation	50	50	50	0	0
TOTALS:	1,280	1,910	92%	8%	0%
% Increase:		49%			

Determination of Estimated Existing Activity:

An empirical method was utilized to verify the probable current activity at the Gila Bend Municipal Airport, as follows:

- < The estimated number of based aircraft, and annual local, itinerant, and total operations were calculated by application of the empirical airport activity equations derived from research of airport activity within the State of Arizona conducted by Gannett Fleming during 2000-2001. The Gannett Fleming Adjusted Regional Model for Small Airports (ARM) program was used in these computations.

The equations and assumptions used are as follows:

$$\begin{aligned} B_{MAX} &= \text{Probable Maximum Number of Based Aircraft at Gila Bend} \\ B_{ADJ} &= \text{Adjusted Number of Based Aircraft} \\ &\quad \text{(Computed and adjusted by reference to airport elevation,} \\ &\quad \text{services, economic indicators, and location - proprietary} \\ &\quad \text{methods)} \\ P &= \text{Service Area Population} = 2,200 \\ \\ Y_T &= \text{Total Annual Operations} \\ Y_L &= \text{Annual Local Operations} \\ Y_I &= \text{Annual Itinerant Operations} \\ \\ Y_T &= 1,850(B_{ADJ}) \\ Y_I &= 0.63Y_T \\ Y_L &= Y_T - Y_I \end{aligned}$$

- C Two estimates of current activity were examined. Model 1 assumes that the economic growth in the airport service area is near the average economic growth that is occurring in Arizona's nonmetropolitan counties. Model 2 assumes that the Gila Bend area's growth is currently more like that of Maricopa County, which is primarily influenced by the Phoenix metro area.
- C The User Survey activity estimate average for 21 U.S. general aviation airports was used to indicate the current average number of *annual based operations per resident aircraft* (225).
- < The average number of *transient operations per based aircraft* was calculated as the difference between the total operations per based aircraft and the average annual based operations per resident aircraft. Transient activity was split between Training and Non-Training operations based on the results of the

Section 2: Forecasts of Aviation Activity

survey of Arizona Flight Schools.

Total *transient operations* were computed as follows:

Total Annual Operations - 225(Total Based Aircraft)

- < The mix of various types of transient aircraft was based on the FAA's 1994 records of hours flown by the U.S. aircraft fleet, differentiated by type as follows:

Fixed-Wing Piston	18,700,000 hrs	81.3%
Jet and Turboprop	2,400,000 hrs	10.5%
Piston Rotorcraft	400,000 hrs	1.7%
Turbine Rotorcraft	1,500,000 hrs	6.5%

The Estimated 2003 Activity at the Gila Bend Municipal Airport has been estimated as presented on the following page, based on the above criteria.

NOTE: It is important to understand that the level of current activity presented below, as well as the forecast projections that follow, are statistical estimates of potential levels of activity, and not necessarily reflections of actual activity. These empirical values may be viewed as the “worst case” scenario for demands that may be placed upon the airport’s infrastructure, based upon analysis of similar-sized facilities. Actual aviation demand is always related to changes in local, national and regional industry and commerce, the ability and willingness of the airport owner to promote the airport as a viable economic asset, as well as intangible variables such as public preference and confidence in government.

Comparison of the differences in forecasts between the SANS, TAF and the two prior Master Plans illustrate that estimating activity at an airport is more of an art than a science (see page 2-8). The approach used in the preparation of the projections contained in this study is to identify a conservative level of activity that represents the maximum demand that may be placed on the airport. This level is then used as a baseline for recommending improvements that will ensure that the airport will be able accommodate future demand.

Section 2: Forecasts of Aviation Activity

**Estimated 2003 Activity - MODEL 1: NON-METRO GROWTH
Gila Bend Municipal Airport - Gila Bend, Arizona**

Total Based Aircraft (Probable Maximum)				4
Total Based Aircraft (Actual)				1
TOTAL ANNUAL OPERATIONS				5,171
Annual Local Operations				1,915
Annual Itinerant Operations				3,256
Type of Aircraft Operation	Based	Transient		TOTAL
		Training	Non-Training	
Fixed-Wing Piston	225	1,280	2,741	4,246
Jet and Turboprop	0	0	519	519
Piston Rotorcraft	0	0	84	84
Turbine Rotorcraft	0	0	321	321
TOTAL ESTIMATED 2003 ACTIVITY (Low Range)	225	1,280	3,666	5,171

Section 2: Forecasts of Aviation Activity

**Estimated 2003 Activity - MODEL 2: METRO GROWTH INFLUENCE
Gila Bend Municipal Airport - Gila Bend, Arizona**

Total Based Aircraft (Actual)				1
Total Based Aircraft (Potential - Adjusted)				5
TOTAL ANNUAL OPERATIONS				9,636
Annual Local Operations				3,568
Annual Itinerant Operations				6,068
Type of Aircraft Operation	Based	Transient		TOTAL
		Training	Non-Training	
Fixed-Wing Piston	1,125	1,280	5,639	8,044
Jet and Turboprop	0	0	894	894
Piston Rotorcraft	0	0	145	145
Turbine Rotorcraft	0	0	553	553
TOTAL ESTIMATED 2003 ACTIVITY (High Range)	1,125	1,280	7,231	9,636

FORECASTS OF FUTURE ACTIVITY

Alternate Forecasts of Aviation Activity:

The Gila Bend Municipal Airport is located in an area that may be characterized as just outside of the direct influence of the Phoenix metropolitan area. The Phoenix area is one of the fastest growing in the country and current trends include suburban “sprawl” to the west along Interstate Highway 8 toward Buckeye. This growth may continue south in the future toward Gila Bend. If this does occur, the airport will undoubtedly experience an increase in demand.

It is also possible that, within the time frame of this study, airport demand will remain somewhat constrained by the distance from the metropolitan center.

For these reasons, two alternate 20-year demand projections have been made, each based on a different set of economic growth indicators.

The Gannett Fleming Airport Development Group has developed a computer model (the Adjusted Regional Model for Small Airports, or ARM - as presented above) in order to facilitate estimation of the number of based aircraft and operations that can be expected at a new airport facility. This model is based on a database of existing available data for airports within the state, including location, economic indicators of the area, the actual number of based aircraft at each airport in the system, population of the airport’s nearest community, airport elevation, and the airport’s location in relation to other airports and to the state’s major metropolitan areas. The two alternate forecasts are based on the ARM computer model.

The ARM software calculates the expected number of based aircraft with regard to the population of the new or emergent airport’s service area and the per capita income of the county where the airport will reside. The result of this initial calculation is then adjusted based on the elevation of the airfield (a measure of aircraft performance limitations that might affect utilization), the airport’s distance from the nearest major metro area (Phoenix or Tucson), the airport’s distance from any other airport that might compete for operations, and whether or not fuel will be available at the study airport.

The initial number of annual aircraft operations (itinerant, local and total) is then computed based on a set of equations that are calibrated to the size of the community served, and the number of based aircraft, number of operations and population are projected for a 20 year planning period, based on the growth rates for Arizona counties.

The ARM v1.20 software uses population and economic data from the Arizona

Section 2: Forecasts of Aviation Activity

Department of Economic Security for the 1990 through 2000 period.

For the Gila Bend Municipal Airport, two scenarios were examined. Model 1 assumes that the economic growth in the airport service area will remain near the average economic growth that is occurring in Arizona's nonmetropolitan counties. Model 2 assumes that the Gila Bend area's growth will increase to that of Maricopa County, which is primarily influenced by the Phoenix metro area.

Forecast Model 1: For the projections for the Model 1 scenario, the following parameters were used.

2003 Service Area Population	2,200
Region	Arizona Non-Metro
2000 Per Capita Income	\$ 17,768
1990-2000 Population Growth Rate	+ 2.42% / year
Airport Elevation	781' MSL
Highway miles from Phoenix	68 miles
Highway miles to nearest competing airport (Buckeye)	38 miles
Aviation fuel will not be available at the airport.	

Forecast Model 2: For the projections for the Model 2 scenario, the following parameters were used.

2003 Service Area Population	2,200
Region	Maricopa County
2000 Per Capita Income	\$ 28,329
1990-2000 Population Growth Rate	+ 3.41% / year
Airport Elevation	781' MSL
Highway miles from Phoenix	68 miles
Highway miles to nearest competing airport (Buckeye)	38 miles
Aviation fuel will be made available at the airport.	

The detailed results of the modeling are presented on the following pages. A summary graphic comparison of the forecasts follows.

It is probable that the activity at Gila Bend will fall somewhere within the range of the two forecast models. Planning, therefore, should be for the highest projected demand.

**FORECAST MODEL 1: NON-METRO GROWTH
ADJUSTED REGIONAL MODEL FOR SMALL AIRPORTS (ARM v1.20)**

Service Area Population.....	2200
Alternate AZ Non-Metro per capita income = \$ 17768	
Airport elevation (MSL) to establish performance limitation...	781
Approximate highway miles from airport to a major metro area..	68
Approximate highway miles to closest neighboring airport.....	38
Fuel is NOT available at the airport.	
Unadjusted Based Aircraft.....	4.14
Based aircraft adjusted for performance limitation.....	3.36
Based Aircraft adjusted for Per Capita Income.....	3.36
Based Aircraft adjusted for influence of metro area.....	3.39
Based Aircraft adjusted for influence of nearby airport.....	3.21
Based Aircraft adjusted for service availability.....	2.73
ADJUSTED PROJECTED BASED AIRCRAFT.....	3
Population growth rate for <u>Alternate AZ Non-Metro</u>	2.42%/YR

20 YEAR FORECAST OF AIRPORT ACTIVITY

Year	Population	Based AC	O P E R A T I O N S		
			Itinerant	Local	Total
2003	2200	3	3256	1915	5171
2004	2253	3	3335	1961	5296
2005	2308	3	3416	2009	5424
2006	2364	3	3498	2057	5556
2007	2421	3	3583	2107	5690
2008	2479	4	3670	2158	5828
2009	2539	4	3759	2210	5969
2010	2601	4	3850	2264	6113
2011	2664	4	3943	2319	6261
2012	2728	4	4038	2375	6413
2013	2794	4	4136	2432	6568
2014	2862	5	4236	2491	6727
2015	2931	5	4338	2551	6890
2016	3002	5	4443	2613	7056
2017	3075	5	4551	2676	7227
2018	3149	5	4661	2741	7402
2019	3225	6	4774	2807	7581
2020	3303	6	4889	2875	7765
2021	3383	6	5008	2945	7953
2022	3465	6	5129	3016	8145
2023	3549	7	5253	3089	8342

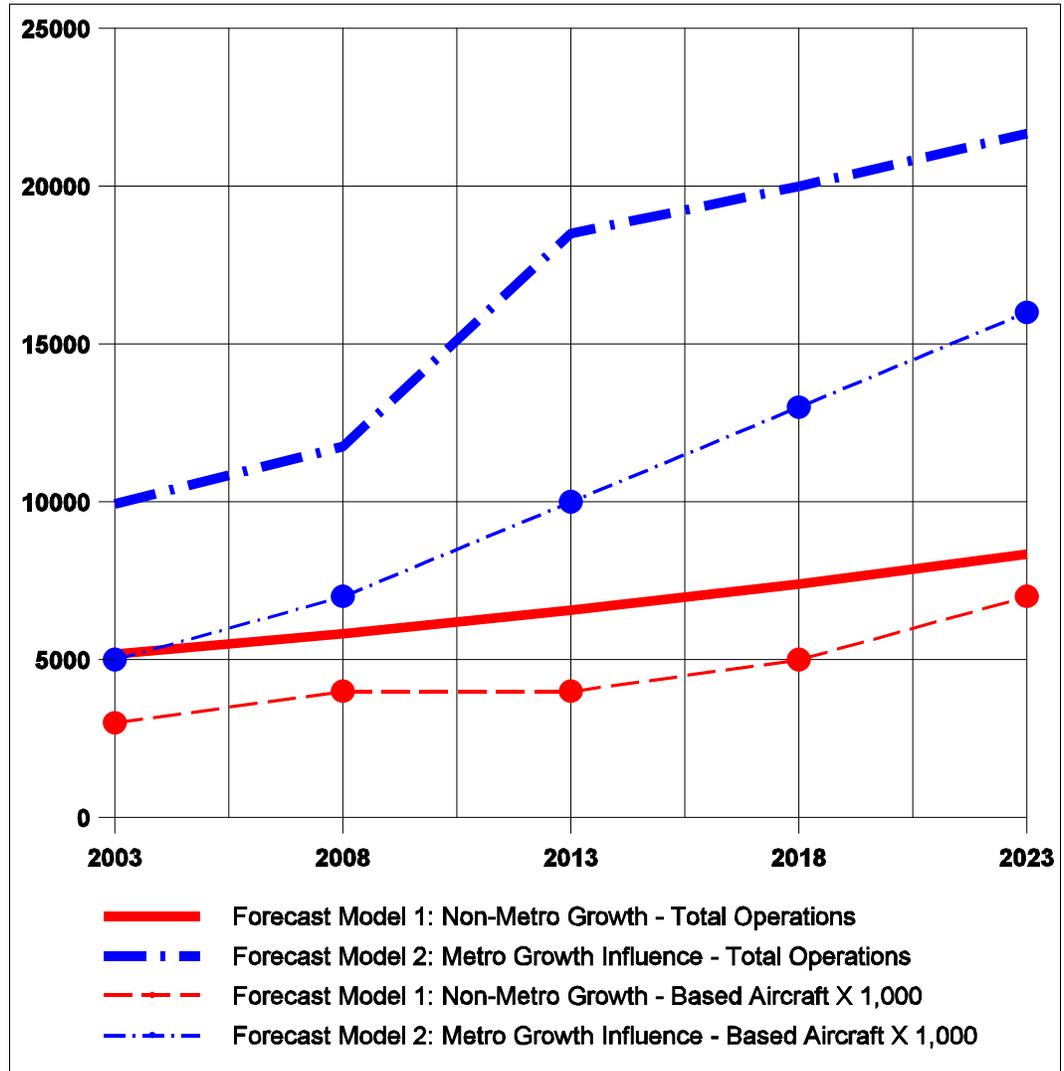
**FORECAST MODEL 2: METRO GROWTH INFLUENCE
ADJUSTED REGIONAL MODEL FOR SMALL AIRPORTS (ARM v1.20)**

Service Area Population.....	2200
Maricopa County per capita income = \$ 28776	
Airport elevation (MSL) to establish performance limitation...	781
Approximate highway miles from airport to a major metro area..	68
Approximate highway miles to closest neighboring airport.....	38
Fuel is available at the airport.	
Unadjusted Based Aircraft.....	4.14
Based aircraft adjusted for performance limitation.....	3.36
Based Aircraft adjusted for Per Capita Income.....	5.43
Based Aircraft adjusted for influence of metro area.....	5.49
Based Aircraft adjusted for influence of nearby airport.....	5.20
Based Aircraft adjusted for service availability.....	5.20
ADJUSTED PROJECTED BASED AIRCRAFT.....	5
Population growth rate for <u>Maricopa County</u>	3.41%/YR

20 YEAR FORECAST OF AIRPORT ACTIVITY

Year	Population	Based AC	O P E R A T I O N S		
			Itinerant	Local	Total
2003	2200	5	6254	3684	9948
2004	2275	6	6478	3809	10287
2005	2353	6	6699	3939	10638
2006	2433	7	6927	4073	11000
2007	2516	7	7163	4212	11376
2008	2602	7	7407	4356	11763
2009	2690	8	7660	4505	12165
2010	2782	8	7921	4658	12579
2011	2877	9	8191	4817	13008
2012	2975	10	8471	4981	13452
2013	3076	10	10872	7625	18497
2014	3181	11	11010	7774	18784
2015	3290	11	11151	7926	19078
2016	3402	12	11296	8083	19378
2017	3518	12	11443	8242	19686
2018	3638	13	11595	8406	20001
2019	3762	14	11749	8573	20322
2020	3890	14	11907	8744	20651
2021	4023	15	12069	8918	20987
2022	4160	16	12233	9096	21330
2023	4302	16	12401	9278	21679

Comparison of Aviation Activity Forecast Models Gila Bend Municipal Airport 2003-2023



Critical Aircraft Determination:

The "critical", or "design", aircraft for any given airport facility is defined as that aircraft (or group of aircraft) whose dimensional and/or performance characteristics are the basis for selection of facilities design criteria. The critical aircraft must be demonstrated to account for a minimum of 500 annual actual or forecast operations.

Different aircraft may govern the requirements for runway design, and for lateral and vertical separation standards. The factors usually considered are the aircraft maximum gross takeoff weight, approach speed category, wingspan, and tail height.

Based on a comparison between the design criteria contained in FAA Advisory Circular AC 150/5300-13 and the existing airport facilities, the Gila Bend Municipal Airport is presently able to accommodate small aircraft (less than 12,500 pound takeoff weights), up to Approach Category B (less than 121 knot approach speeds), and Airplane Design Group II (wingspan less than 79 feet).

Therefore, an ARC B-II reference code is indicated as the airport's present role.

See Section 1, Page 1-15 for definitions of the FAA Aircraft Reference Code, or "ARC", system of airport classification.

The critical aircraft currently using the Gila Bend Municipal Airport facilities is a mix of ARC B-I through B-II piston singles and twins, which may account for a total of over 500 annual operations.

The character of the aeronautical activity at Gila Bend will most probably not change significantly through the planning period, and the level of demand is not forecast to increase significantly.

A representative "design fleet" of ARC A-I, A-II, B-I and B-II aircraft is presented in the tables on the following pages. The tables are output files from the AcData v6.10 aircraft database, which provides aircraft dimensional and approximate performance criteria for 465 aircraft types and configurations. Runway requirements for the various aircraft were computed based on a density altitude of 4,165', which was derived by using a pressure altitude of 781' MSL at 110E Fahrenheit.

Section 2: Forecasts of Aviation Activity

Page 2-22 is a tabulation of aircraft with takeoff weights up to 12,500 pounds that can be accommodated by the present runway configuration and length (5,200').

Pages 2-23 and 2-24 list a mix of additional aircraft through ARC B-II, with takeoff weights of between 12,500 pounds and 30,000 pounds, and between 30,000 pounds and 60,000 pounds, respectively, that could be accommodated at Gila Bend if additional runway length and pavement strength were to be made available in the future. These critical aircraft listings indicate that an 9,300' long runway would accommodate all of the selected database aircraft at the 4,165' density altitude. However, most of the listed types could be accommodated by a 6,500' runway.

In addition to the longer runway and increased runway design strength, accommodating the larger and faster aircraft would require that the taxiways and apron pavement also be strengthened.

With a runway extension to 6,500' and strengthening to accommodate 30,000 pound aircraft, the airport could be used by aircraft as large as the Saab 340B and Merlin IVC commuter airline turboprops and the Falcon 200 business jet, and other types that have less than 30,000 pound takeoff weights.

With the same runway extension (6,500'), and strengthening to accommodate 60,000 pound aircraft loads, the airport could be used by aircraft as large as the Gulfstream I and the Falcon 50, 900 and 200 series business jets.

With additional improvements to upgrade the airport to a classification of ARC C-II, aircraft as large as the 58,000 pound Gulfstream III could be accommodated, as well as the Lockheed Jetstar operating at a reduced load.

**Gila Bend Municipal Airport
Current Critical Aircraft Design Fleet
Existing Runway Length (5,200') and 12,500# Maximum Takeoff Weight**

PARAMETERS :

DENSITY ALTITUDE : 4,165 MSL
 GENERAL TYPE CODE : General (all types - piston, turboprop and jet)
 U.S CUSTOMARY UNITS : Speed in knots.....Lengths in Feet.....Weight in Pounds

Greater Than: 0.00 0.00 0.00 0.00 0.00 0.00
 & Less Than: 121.00 79.00 100.00 50.00 12500.10 5200.10

 Model-----AppSpeed--WingSpan--AClength--TailHite--TOWeight---RWindex

ARC A-I

Beechcraft 65 Queen Air	90	45.88	33.33	14.17	7700	3730
Beechcraft A35	72	32.75	25.08	6.50	3500	2750
Cessna 152	56	33.20	24.10	8.50	1670	2038
Cessna 170	65	36.00	25.00	6.42	2200	2641
Cessna 172	60	36.00	26.90	8.80	2400	2304
Cessna 182Q	64	36.00	28.00	9.20	2950	1894
Cessna 210N	73	36.80	28.20	9.70	3800	1550
Piper PA-12	65	35.33	22.75	6.75	1750	3316

ARC A-II

Beechcraft E-18S	87	49.20	35.10	10.50	9300	3654
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ARC B-I

Beechcraft B100	111	45.90	39.90	15.40	11500	4562
Cessna 310R	93	36.92	31.96	10.67	5500	4704
Metro III	112	46.20	59.40	16.70	12500	3925
Metro II SA226-TC	112	46.25	59.42	16.67	12500	3500
Cessna 425	103	44.10	35.90	12.60	8600	4530
Cessna 340A	92	38.10	34.30	12.60	5990	3999
Cessna 402C	95	44.12	36.38	11.45	6850	4372
Cessna 414A	94	44.10	36.40	11.50	6750	4928
Cessna 421C	96	41.10	36.40	11.50	7450	4216

ARC B-II

Beechcraft B200	98	54.50	43.80	15.00	12500	3733
Merlin IVC	113	57.00	59.33	16.67	12500	3925
Cessna 441	99	49.30	34.70	12.80	9850	4326

CRITICAL PARAMETERS =====

Runway Length Index.....(4928) Cessna 414A @ 6750 #
 WingSpan.....(57.00) Merlin IVC
 Tail Height.....(16.70) Metro III
 Aircraft Length.....(59.42) Metro II SA226-TC
 Takeoff Weight.....(12500) Beechcraft B200
 Approach Speed.....(113) Merlin IVC
 =====

Source: AcData v6.10 computer database of 465 aircraft

Gila Bend Municipal Airport
Potential Critical Aircraft Design Fleet - ARC B-I and ARC B-II
Unlimited Runway Length and 12,500# - 30,000# Takeoff Weight

PARAMETERS :

DENSITY ALTITUDE : 4,165 MSL
GENERAL TYPE CODE : General (all types - piston, turboprop and jet)
U.S CUSTOMARY UNITS : Speed in knots.....Lengths in Feet.....Weight in Pounds

Greater Than: 0.00 0.00 0.00 0.00 12500.00 0.00
& Less Than: 121.00 79.00 100.00 50.00 30000.10 10000.00

Model-----AppSpeed--WingSpan--AClength--TailHite--TOWeight---RWindex

ARC B-I

Falcon 10	104	42.90	45.50	15.10	18740	5225
Learjet 28/29	120	43.75	47.58	12.25	15000	3833
Metro III	112	46.20	59.40	16.70	16000	5641
Sabreliner NA-265-60	120	44.50	48.30	16.00	20000	6499

ARC B-II

Falcon 20	107	53.50	56.30	17.40	26000	5133
Falcon 20	107	53.50	56.30	17.40	28660	6533
Falcon 200	114	53.50	56.30	17.40	20000	3246
Falcon 200	114	53.50	56.30	17.40	26000	3933
Falcon 50	113	61.90	60.80	22.90	22000	2996
Falcon 50	113	61.90	60.80	22.90	30000	3325
Falcon 900	100	63.40	66.30	24.80	28000	2817
Merlin IVC	113	57.00	59.33	16.67	16000	5391
Nord 262	96	71.90	63.30	20.40	21400	4033
Saab 340B	104	70.33	64.67	22.50	30000	5766
Saab 340B	104	70.33	64.67	22.50	25000	3733
Saab-Fairchild SF 340A	104	70.33	64.67	22.50	28000	5550
Saab-Fairchild SF 340A	104	70.33	64.67	22.50	25000	4170
Westwind Astra	110	52.67	55.58	18.17	24650	7491
Westwind Astra	110	52.67	55.58	18.17	23000	5900
Westwind Astra	110	52.67	55.58	18.17	20000	4700
Embraer EMB-120 Brasilia	108	64.90	65.60	20.80	25353	5541
Embraer EMB-120 Brasilia	108	64.90	65.60	20.80	24000	5037
Sabreliner NA-265-65	105	50.50	46.10	16.00	24000	9266
Sabreliner NA-265-65	105	50.50	46.10	16.00	19000	5224

C R I T I C A L P A R A M E T E R S =====

Runway Length Index.....(9266) Sabreliner NA-265-65 @ 24000 #
WingSpan.....(71.90) Nord 262
Tail Height.....(24.80) Falcon 900
Aircraft Length.....(66.30) Falcon 900
Takeoff Weight.....(30000) Falcon 50
Approach Speed.....(120) Learjet 28/29
=====

Source: AcData v6.10 computer database of 465 aircraft

Gila Bend Municipal Airport
Potential Critical Aircraft Design Fleet - ARC B-II and ARC C-II
Unlimited Runway Length and 30,000# - 60,000# Takeoff Weight

PARAMETERS :
 DENSITY ALTITUDE : 4,165 MSL
 GENERAL TYPE CODE : General (all types - piston, turboprop and jet)
 U.S CUSTOMARY UNITS : Speed in knots.....Lengths in Feet.....Weight in Pounds

Greater Than: 0.00 0.00 0.00 0.00 30000.00 0.00
 & Less Than: 141.00 79.00 100.00 50.00 60000.10 10000.00

 Model-----AppSpeed--WingSpan--AClength--TailHite--TOWeight---RWindex-

ARC B-II

Falcon 200	114	53.50	56.30	17.40	30650	5766
Falcon 50	113	61.90	60.80	22.90	37480	4933
Falcon 900	100	63.40	66.30	24.80	45500	5908
Falcon 900	100	63.40	66.30	24.80	34000	3475
Gulfstream I	113	78.30	75.30	23.00	36000	6733
Gulfstream I	113	78.30	75.30	23.00	34000	5541

ARC C-II

Gulfstream III	136	77.80	83.10	24.40	58000	4500
Gulfstream III	136	77.80	83.10	24.40	50000	3450
Lockheed Jetstar	132	54.42	60.42	20.42	42000	8683
Lockheed Jetstar	132	54.42	60.42	20.42	34000	5650
Lockheed Jetstar II	132	54.42	60.42	20.42	44500	4758
Lockheed Jetstar II	132	54.42	60.42	20.42	36000	4558

CRITICAL PARAMETERS =====
 Runway Length Index.....(8683) Lockheed Jetstar @ 42000 #
 WingSpan.....(78.30) Gulfstream I
 Tail Height.....(24.80) Falcon 900
 Aircraft Length.....(83.10) Gulfstream III
 Takeoff Weight.....(58000) Gulfstream III
 Approach Speed.....(136) Gulfstream III
 =====

Source: AcData v6.10 computer database of 465 aircraft

AIRPORT SEASONAL USE

Seasonal Use Curve:

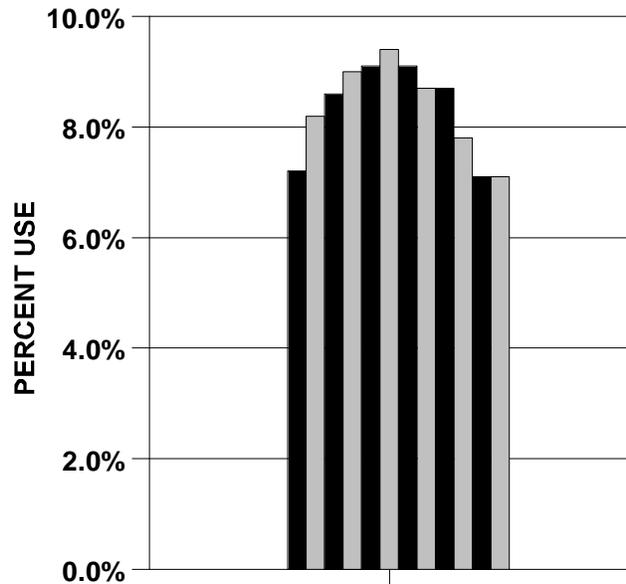
Some level of seasonal fluctuation in aircraft operations may be expected at any airport. This fluctuation is most apparent in regions with severe winter weather patterns, at nontowered general aviation airfields. The fluctuation is less pronounced at major airports, with a high percentage of commercial and scheduled airline activity, and also at those facilities with a milder winter climate and/or a high percentage of training activity.

The southern Arizona climate provides a very stable environment for aviation activity. The winter weather is mild and although daytime summer temperatures are typically in the 90's and 100's, the morning and evening hours are usually quite comfortable, affording pleasant flying conditions.

Typically, instrument conditions in Arizona occur less than 3% of the time.

The probable future seasonal use at Gila Bend Municipal Airport was modeled by applying the forecast total annual operations to an average seasonal use trend curve. This seasonal use curve is presented below. In the absence of historical records for the Gila Bend airport, the selected curve is based upon the 1979-84 FAA records of aircraft operations handled by towered facilities nationally (from the FAA Statistical Handbook of Aviation).

Seasonal Use Trend Curve	
January	7.2%
February	8.2%
March	8.6%
April	9.0%
May	9.1%
June	9.4%
July	9.1%
August	8.7%
September	8.7%
October	7.8%
November	7.1%
December	7.1%



Peak Demand Calculations:

In order to arrive at a reasonable estimate of the actual peak demand upon the airport facilities, it was necessary to develop a method to calculate the estimated Maximum Peak Hourly Demand which might be expected to occur during the hours of peak usage of the airport. The Seasonal Use Trend Curve, as presented above, was used as a tool to determine this usage.

Using the Seasonal Use information, a formula was derived which will calculate the average daily operations in a given month, based on the percentage of the total annual operations for that month, as determined by the curve.

The formula is as follows:

$$\begin{aligned} \textit{Where} \quad T &= \text{Monthly percent of use (from curve).} \\ M &= \text{Average monthly operations.} \\ A &= \text{Total annual operations.} \\ D &= \text{Average Daily Operations in a given month.} \\ M &= A (T / 100) \\ D &= M / (365 / 12) \end{aligned}$$

Experience has shown that approximately 90% of total daily operations will occur between the hours of 7:00 AM and 7:00 PM (12 hours) at a typical General Aviation airport, and that the maximum peak hourly occurrence may be 50% greater than the average of the hourly operations calculated for this time period.

Therefore, the *Estimated Peak Hourly Demand* (P) in a given month was determined by compressing 90% of the Average Daily Operations (D) in a given month into the 12 hour peak use period, reducing that number to an hourly average for the peak use period, and increasing the result by 50%, as follows:

$$\begin{aligned} \textit{Where} \quad D &= \text{Average Daily Operations in a given month.} \\ P &= \text{Peak Hourly Demand in a given month.} \\ P &= 1.5 (0.90D / 12) \end{aligned}$$

The monthly, daily, and hourly demand was computed for both the present 2003 and the ultimate year 2023 conditions, using the most critical forecast model (Model 2).

The results are as follows:

Section 2: Forecasts of Aviation Activity

Planning Year:	2003	Estimated Hourly Demand / Month Gila Bend Municipal Airport Estimated Potential Activity - 2003		
Operations:	9,948			
Month	% USE	Monthly	Daily	Hourly
January	7.20	716	24	3
February	8.20	816	27	3
March	8.60	856	28	3
April	9.00	895	29	3
May	9.10	905	30	3
June	9.40	935	31	3
July	9.10	905	30	3
August	8.70	865	28	3
September	8.70	865	28	3
October	7.80	776	26	3
November	7.10	706	23	3
December	7.10	706	23	3

Planning Year:	2023	Estimated Hourly Demand / Month Gila Bend Municipal Airport Estimated Potential Activity - 2023		
Operations:	21,679			
Month	% USE	Monthly	Daily	Hourly
January	7.20	1,561	51	6
February	8.20	1,778	58	7
March	8.60	1,864	61	7
April	9.00	1,951	64	7
May	9.10	1,973	65	7
June	9.40	2,038	67	8
July	9.10	1,973	65	7
August	8.70	1,886	62	7
September	8.70	1,886	62	7
October	7.80	1,691	56	6
November	7.10	1,539	51	6
December	7.10	1,539	51	6

Airport Demand Versus Capacity:

As is evident in the tables above, the maximum peak demand occurs in June, with a present potential for 3 operations per hour and an ultimate demand potential of 8 peak operations per hour.

The methodology for computing the relationship between an airport's configuration and its theoretical capacity is contained in FAA Advisory Circular AC 150/5060-5, Airport Capacity and Delay. The FAA's Airport Design version 4.2A computer program includes a routine for estimating capacity of small airports that is based on this methodology.

The Annual Service Volume, or ASV, is a calculated reasonable estimate of an airport's total annual capacity, taking into account differences in runway utilization, weather conditions and aircraft mix that might be encountered in a year's time. When compared to the existing or forecast operations of an airport, the ASV will give an indication of the adequacy of the facility in relationship to its activity level.

The ASV for Gila Bend Municipal Airport, in its present single runway configuration, is 230,000 annual operations. The forecasts developed in this study indicate that total annual activity will be about 21,679 operations in the year 2023, or about 9.3% of the airport's ASV.

The airport's capacity in terms of operations per hour is estimated as 98 operations per hour in Visual Flight Rules (VFR) conditions, and 59 operations per hour in Instrument Flight Rules (IFR) conditions. The hourly demand estimates developed in this study indicate that hourly activity will not exceed 8 operations during the twenty year planning period.

There are no capacity constraints apparent for the Gila Bend Municipal Airport.