



Chapter 2

FORECASTS

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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. In airport master planning, this involves projecting potential aviation activity over at least a twenty-year timeframe. For general aviation reliever airports such as Ryan Airfield, forecasts of based aircraft and general aviation operations (takeoffs and landings) serve as a basis for facility planning.

The Federal Aviation Administration (FAA) has a responsibility to review aviation forecasts that are submitted to the agency in conjunction with airport planning, including master plans, 14 CFR Part 150 Studies, and environmental studies. The FAA reviews such forecasts with the objective of including them in 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 (NPIAS), 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 the airport planning and development.

The forecast process for an airport master plan consists of a series of basic steps that can vary depending upon the issues to be addressed and the level of effort required to develop the forecast. The steps include a review of previous forecasts, determination of data needs, identification of data sources, collection of data, selection of forecast methods, preparation of the forecasts, and evaluation and documentation of the results.

The following forecast analysis for Ryan Airfield was produced following these basic guidelines. Other forecasts dating back to the previous master plan were examined and compared against current and historic activity. The historical aviation activity was then examined along with other factors and trends that could affect demand. The intent is to provide an updated set of aviation demand projections for Ryan Airfield that will permit the Tucson Airport Authority (TAA) to make planning adjustments as necessary to maintain a viable, efficient, and cost-effective facility.

NATIONAL AVIATION TRENDS

Each year, the FAA updates and publishes a national aviation forecast. Included in this publication are forecasts for passengers, airlines, air cargo, general aviation, and FAA workload measures. The forecasts are prepared

to meet the 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 2009-2025*, published in March 2009. 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.

Since the events of September 11, 2001, the United States has experienced the impacts of heightened security concerns, the bankruptcy of four major airlines, record high fuel prices, and now a global economic crisis. It was determined by the National Bureau of Economic Research that the U.S. economy entered into a recession in December 2007. This economic situation is expected to dampen near-term growth in the general aviation industry.

According to the Bureau of Economic Analysis, Gross Domestic Product (GDP) fell 3.8 percent in the fourth quarter of calendar year (CY) 2008. The President's stimulus package and monetary policies are projected to pull the economy out of the recession in the second half of 2009. GDP is projected to grow between 2.4 and 4.5 percent annually between 2010 and 2013. Beyond 2013, GDP is projected to grow at a slower rate of 2.6 percent per year through 2025.

The world GDP is forecast to shrink in 2009 by 0.7 percent. Growth in world GDP is anticipated to resume in 2010 at a rate of 2.4 percent. Beyond 2010, world GDP is projected to grow at an average annual rate of 3.3 percent. This will positively influence the aviation industry, leading to passenger, air cargo, and general aviation growth throughout the forecast period.

GENERAL AVIATION

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

The sustained growth in the general aviation industry slowed considerably in 2001, negatively impacted by the events of 9/11. Thousands of general aviation aircraft were grounded for weeks due to no-fly zone restrictions imposed on operations of aircraft in security-sensitive areas. This, in addition to the economic recession that began in early 2001, had a negative impact on the general aviation industry. General aviation shipments by U.S. manufacturers declined for three

straight years from 2001 through 2003.

Stimulated by an expanding U.S. economy, as well as accelerated depreciation allowances for operators of new aircraft, active general aviation aircraft staged a relatively strong recovery with a 2.2 percent average annual growth rate between 2003 and 2008.

In previous FAA forecasts, the entry of Very Light Jets (VLJs) was anticipated to redefine the business jet segment. VLJs are relatively inexpensive twin-engine aircraft that support a true on-demand air-taxi business service. It was forecast that 500 new VLJ aircraft would enter the fleet annually by 2010. However, since the previous forecast was prepared, Eclipse and DayJet have both filed for bankruptcy. VLJ deliveries totaled only 262 for 2008. Due to the state of the VLJ manufacturing industry, the updated FAA forecasts predict that approximately 200 VLJs will enter the GA fleet over the next two years, and then increase to a rate of 270 to 300 aircraft each year through 2025.

Despite the hardships for the VLJ market, turbojet aircraft are anticipated to grow at a strong rate of 4.8 percent through the forecast period. This increased demand is credited to interest by corporate travelers who would like to avoid flight delays and security issues at major airports. The total number of jets in the general aviation fleet is projected to grow from 11,400 in 2008, to 25,165 by 2025.

In 2008, there were an estimated 234,015 active general aviation air-

craft in the United States. **Exhibit 2A** depicts the FAA forecast for active general aviation aircraft. The FAA projects an average annual increase of 1.0 percent through 2025, resulting in 275,230 active aircraft. Piston-powered aircraft are expected to grow at an average annual rate of 0.1 percent. This is driven primarily by a 5.0 percent annual increase in sport aircraft and growth in experimental and piston powered rotorcraft, as single engine fixed wing piston aircraft are projected to increase at just 0.1 percent annually, and multi-engine fixed wing piston aircraft are projected to decrease by 1.0 percent per year. It is expected that the new, light sport aircraft and the relatively inexpensive VLJs will dilute or weaken the replacement market for piston aircraft.

The “light sport” category of aircraft was created in 2005. Over 6,000 aircraft were registered as “light sport” aircraft by the end of 2007. The FAA projects this category to increase fairly rapidly in the short term with growth tapering off after 2013 reaching 15,865 registrations by 2025.

BASED AIRCRAFT

The number of aircraft based at an airport is, to some degree, dependent upon the nature and magnitude of aircraft ownership in the local service area. In addition, Ryan Airfield is one of several airports serving the general aviation needs of the Tucson metropolitan area. Therefore, the process of developing forecasts of based aircraft for Ryan Airfield begins with a review of historical aircraft registrations in the area.

REGISTERED AIRCRAFT FORECASTS

Historical records of aircraft ownership in Pima County, presented on **Table 2A**, were obtained from the U.S. Census of Civil Aircraft for the years 1987 through 1992; Aviation Goldmine for the years 1993 through 2000; Avantext, Inc., Aircraft & Airmen for the years 2001 to 2006; and the FAA for the years 2007 and 2008. Since 1987, registered general aviation aircraft in the county have grown from 940 to 1,447, for an annual average growth rate of 2.0 percent.

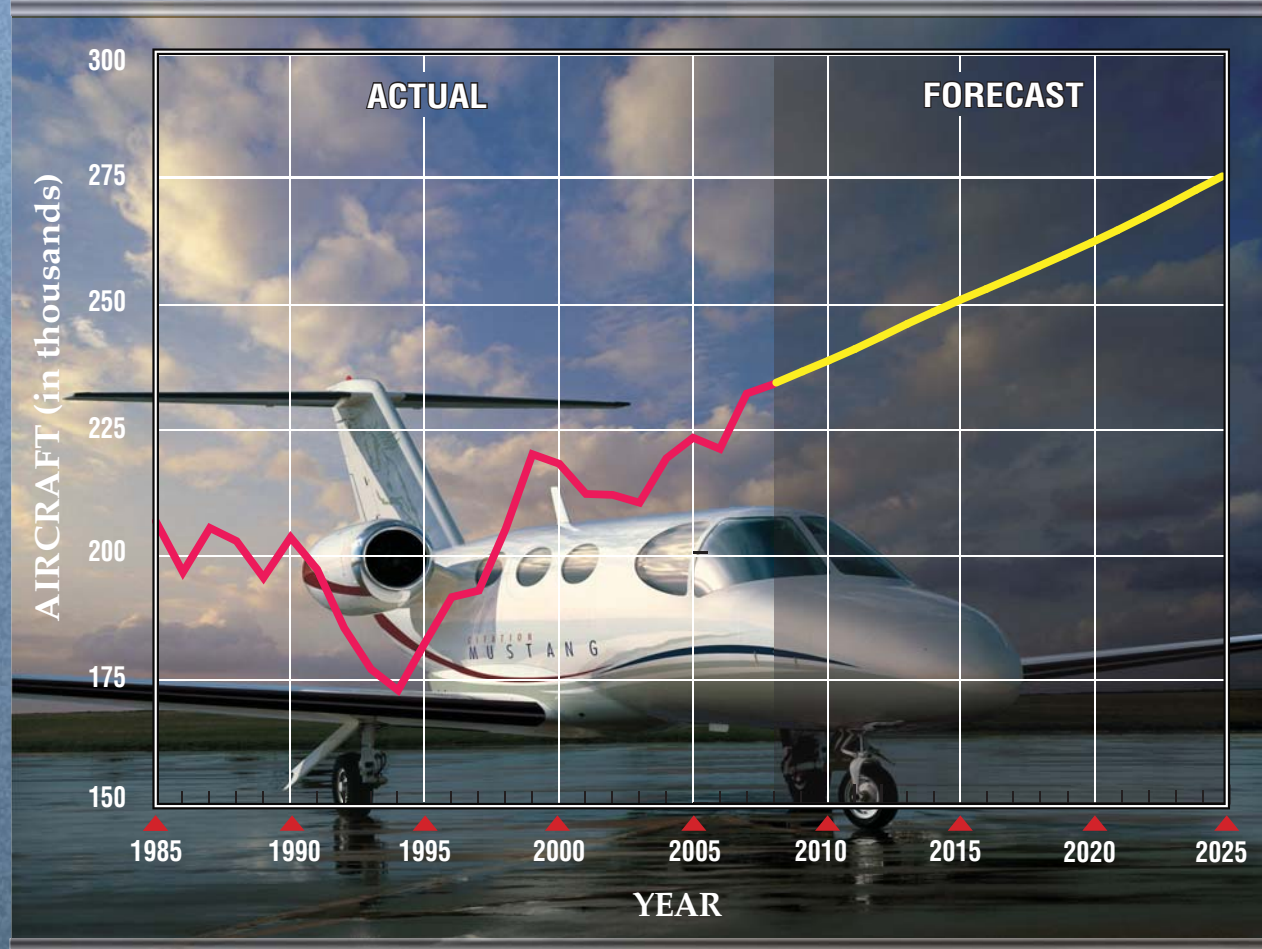
Table 2A also compares registered aircraft to active general aviation aircraft in the United States. The method used by the FAA to tabulate active general aviation aircraft changed in 1992, which is why annual counts before this time were not included in this study. The Pima County share of the U.S. market of general aviation aircraft has grown from 0.502 percent in 1992 to 0.618 percent in 2008.

Socioeconomic Trends

Pima County historical trends for key socioeconomic variables provide an indicator of the potential for creating growth in aviation activities at an airport. Typical variables used in evaluating potential for traffic growth include population and per capita personal income (PCPI). This data is readily available on an annual historic basis at the county level.

Table 2A presents historical population data for Pima County from 1987 to 2008. Population growth has been

U.S. ACTIVE GENERAL AVIATION AIRCRAFT



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

Year	FIXED WING				ROTORCRAFT					
	PISTON		TURBINE		ROTORCRAFT		Experimental	Sport Aircraft	Other	Total
	Single Engine	Multi-Engine	Turboprop	Turbojet	Piston	Turbine				
2008 (Est.)	146.6	19.1	9.6	11.4	3.1	7.1	24.1	7.0	6.0	234.0
2015	143.5	17.9	10.5	17.1	4.6	9.0	29.1	12.7	6.1	250.5
2020	144.9	17.0	11.5	20.9	5.3	9.9	32.0	14.4	6.0	261.8
2025	148.5	16.0	12.2	25.2	5.9	10.9	34.6	15.9	6.0	275.2

Source: FAA Aerospace Forecasts, Fiscal Years 2009-2025.

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

steady over the past 21 years with an increase of 354,923 residents and an

average annual percentage increase of 2.1 percent.

TABLE 2A					
Registered Aircraft and Independent Variables					
Pima County					
Year	Registered Aircraft	U.S. Active Aircraft	% of U.S. Market	Population	PCPI (2004 \$)
1987	940	N/A	N/A	659,100	23,413
1988	919	N/A	N/A	664,400	23,305
1989	949	N/A	N/A	675,300	23,693
1990	918	N/A	N/A	668,500	23,128
1991	909	N/A	N/A	682,875	23,006
1992	932	185,650	0.502%	700,250	22,988
1993	1,033	177,120	0.583%	712,600	23,446
1994	1,074	172,935	0.621%	728,425	23,968
1995	1,102	182,605	0.603%	758,050	23,891
1996	1,101	187,312	0.588%	780,750	24,224
1997	1,131	189,328	0.597%	789,650	24,495
1998	1,127	205,700	0.548%	823,900	25,650
1999	1,165	219,500	0.531%	845,775	26,073
2000	1,260	217,533	0.579%	843,746	26,517
2001	1,279	211,535	0.605%	870,610	26,481
2002	1,284	211,345	0.608%	890,545	26,236
2003	1,298	209,788	0.619%	910,950	26,302
2004	1,301	219,426	0.593%	931,210	27,467
2005	1,337	224,352	0.596%	957,635	27,923
2006	1,341	226,422	0.604%	981,280	28,020
2007	1,448	231,606	0.625%	1,003,918	28,277
2008	1,447	234,015	0.618%	1,014,023	29,997
Constant Share of U.S. Active Aircraft					
2012	1,504	243,170	0.625%	1,113,749	31,400
2017	1,576	254,895	0.625%	1,215,512	33,739
2027	1,736	280,776	0.625%	1,393,778	39,555
Sources:					
Registered Aircraft – U.S. Census of Civil Aircraft (1987-1992), Aviation Goldmine (1993-2000), Avantext, Inc., Aircraft & Airmen (2001-2006), FAA (2007-2008).					
U.S. Active Aircraft – <i>FAA Aerospace Forecasts 2009-2025</i>					
Population – Arizona Department of Economic Security					
PCPI – U.S. Department of Commerce, Bureau of Economic Analysis (1987-2005), Woods & Poole <i>CEDDS</i> , 2008 (2006-2008, 2012, 2017, 2027).					

In Arizona, the Population Technical Advisory Committee (POPTAC) reviews and approves the official population estimates and projections for the state, county, and sub-county levels. These approved estimates and projections are then sent to the Arizo-

na Department of Economic Security (DES) Director as an advisory recommendation. POPTAC membership is made up of several state departments, State Universities, and Tribal Councils, as well as several government associations including the Pima Associa-

tion of Governments (PAG). POPTAC produces population projections twice per decade. The most recent projections were produced in 2006, with forecast population levels through 2055. Population forecasts for this Master Plan's projection years, shown in **Table 2A**, increase the County's total population by almost 380,000 residents. This is an average annual increase of 1.69 percent.

Historical and projected PCPI for the County is also presented on **Table 2A** and are inflation-adjusted to year 2004 dollars. Inflation-adjusted PCPI for the County has been growing at an annual average of 1.19 percent over the last 21 years. Projected numbers through 2027 has PCPI growing at an average annual rate of 1.47 percent.

Registered Aircraft Projections

Based on the historical registered aircraft, U.S. active aircraft, population, and PCPI data, projections of registered aircraft in Pima County have been prepared and are shown in **Table 2B**. First, a market share analysis was developed which keeps Pima County's share of U.S. active aircraft constant through 2027, resulting in a 0.96 percent annual growth rate.

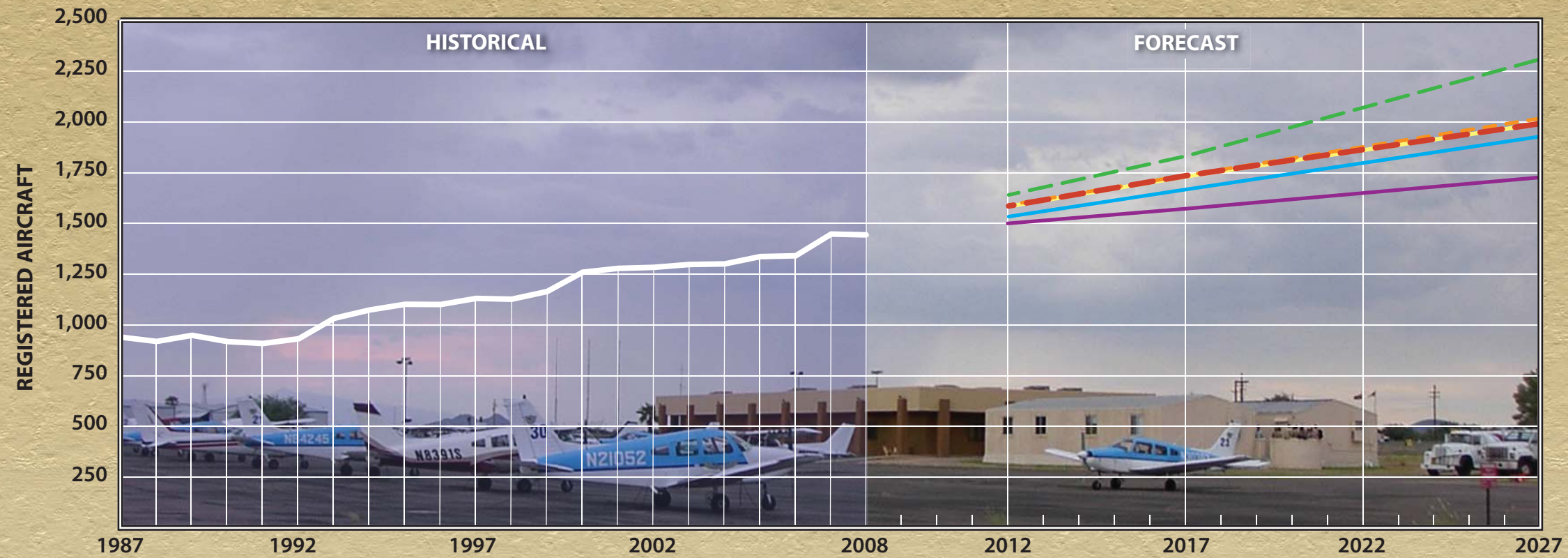
A time-series extrapolation of registered aircraft was developed based upon the period from 1987 to 2008. The correlation coefficient, (r^2), was determined to be 0.957 for this time-

series extrapolation. The correlation coefficient (Pearson's "r") measures the association between changes in the dependent variable (registered aircraft) and the independent variable(s). An r^2 greater than 0.900 generally indicates good predictive reliability. A lower value may be used with the understanding that the predictive reliability is lower.

Several regression analyses were prepared to determine the association between socioeconomic indicators (population and PCPI) and registered aircraft growth. This association is represented by the correlation coefficient. **Table 2B** and **Exhibit 2B** present the resulting projections for comparison with the market share projection.

The results of the regression analysis indicate that the socioeconomic factor that associates closest with registered aircraft change is population. The time-series analysis resulted in a projection that was slightly lower than the other three regressions, and the PCPI regression resulted in a long-range forecast that was significantly higher than the rest. Therefore, the selected registered aircraft forecast was modeled after the single population regression, and the multiple regression with population and PCPI. This selected forecast projects registered aircraft to increase at 1.72 percent annually through the planning period, at almost the same growth rate as population (1.69 percent).

PIMA COUNTY REGISTERED AIRCRAFT



RYAN AIRFIELD BASED AIRCRAFT

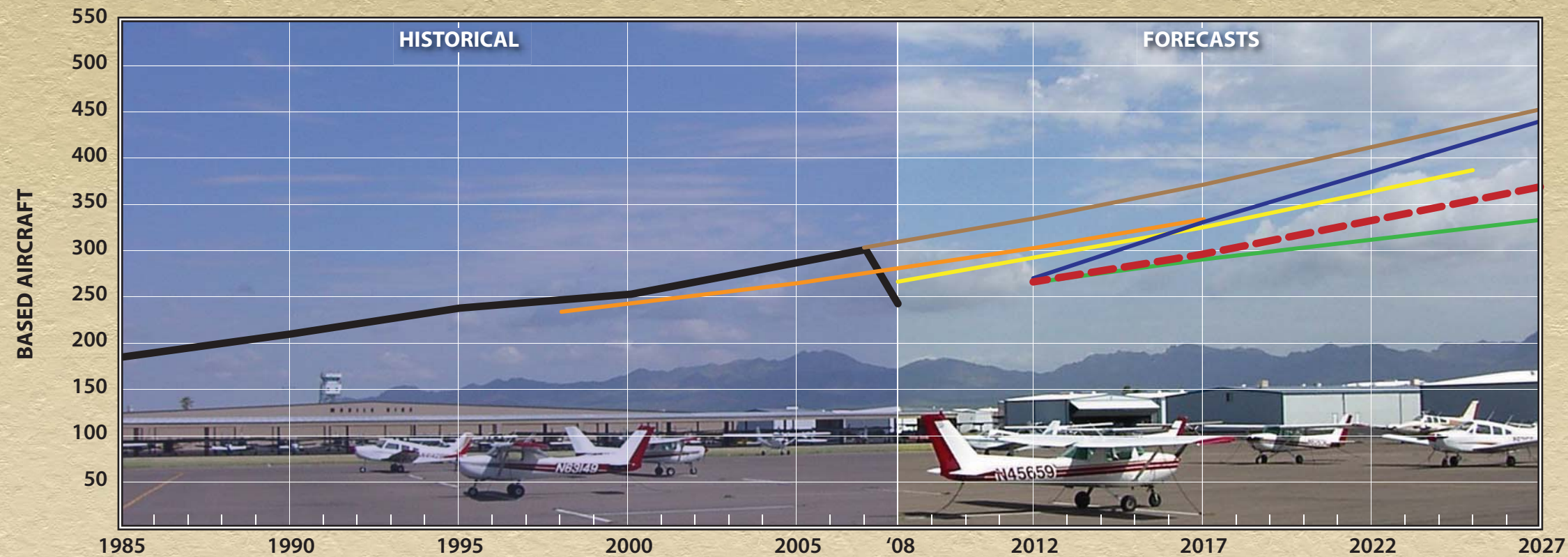


TABLE 2B Registered Aircraft Projections Pima County						
	r ²	2008	2012	2017	2027	Avg. Annual Growth Rate
Market Share Projection						
U.S. Active Aircraft		234,015	243,170	254,895	280,776	0.96%
Constant Share of U.S. Active Aircraft		1,447	1,504	1,576	1,736	0.96%
Regression Analysis Projections						
Time-Series 1987-2008	0.957	1,447	1,538	1,672	1,940	1.56%
Population & PCPI 1987-2008	0.960	1,447	1,595	1,748	2,027	1.79%
Population 1987-2008	0.961	1,447	1,589	1,738	1,999	1.71%
PCPI 1987-2007	0.912	1,447	1,645	1,837	2,316	2.51%
Selected Forecast		1,447	1,590	1,740	2,000	1.72%

BASED AIRCRAFT FORECAST

Before preparing new forecasts for based aircraft, previous based aircraft projections were reviewed for current validity. These included the FAA *Terminal Area Forecast* (TAF) 2008, Arizona *State Aviation System Plan* (SASP) 2008, and the previous *Ryan*

Airfield Master Plan from 1999. Each of the previous forecasts use different base years as well as projection years. For comparison, these were interpolated and extrapolated to correlate with this Master Plan's projection years. Each of these previous based aircraft forecasts are presented in **Table 2C**.

TABLE 2C Previous Based Aircraft Projections Ryan Airfield					
	Current	2008	2012	2017	2027
TAA Records	242				
FAA TAF 2008		267	293	326	405
Arizona SASP 2007		310	336	372	454
Previous Master Plan 1999		281	303	334	N/A

Since each of these previous studies was prepared at different times, it is expected that they will be different from each other and may not match recent historical counts. According to TAA records, the current based aircraft count at Ryan Airfield is 242. The interpolated 2007 projections for each of these previous studies are well

above this number. This can be attributed to the recent loss of the flight school and a downturn in aviation activity in general in the past year.

Having forecast the aircraft ownership demand in Pima County, the historic basing at Ryan Airfield was reviewed to examine the change in market

share over the years. **Table 2D** examines the based aircraft at Ryan Airfield as a percentage of the aircraft

registered to owners' addresses in the County.

TABLE 2D Updated Based Aircraft Projections Ryan Airfield			
Year	Registered Aircraft	Based Aircraft	% of Registered
1985	922	185	20.1%
1990	918	210	22.9%
1995	1,102	238	21.6%
2000	1,260	253	20.1%
2007	1,448	301	20.8%
2008	1,447	242	16.7%
Average Annual Growth	1985-2007: 2.1%	1985-2007: 2.2%	
Constant Share Projection			
2012	1,590	266	16.7%
2017	1,740	291	16.7%
2027	2,000	334	16.7%
Average Annual Growth	1.7%	1.7%	
Increasing Share Projection			
2012	1,590	270	17.0%
2017	1,740	331	19.0%
2027	2,000	440	22.0%
Average Annual Growth	1.7%	3.2%	
Selected Forecast			
2012	1,590	266	16.7%
2017	1,740	296	17.0%
2027	2,000	369	18.5%
Average Annual Growth	1.7%	2.3%	
Source: Based Aircraft – Ryan Airfield Master Plan, 1999 (1985, 1990); FAA TAF, 2006 (1995, 2000); TAA Records (2007, 2008)			

Between 1985 and 2008, Ryan Airfield based aircraft grew from 185 to 242 at a rate of 1.2 percent annually. Despite it's current share of registered aircraft in the county (16.7 percent), Ryan Airfield has held fairly consistent between 20 and 22 percent of the market in the county historically. Two market share projections were generated based off the historical trends. The first projection keeps the current market share static at 16.7 percent, resulting in 334 based aircraft by 2027 and an annual average growth rate of 1.7

percent. A second projection was generated which increased Ryan Airfield's market share of registered aircraft over the planning period, resulting in 440 based aircraft by 2027 and an average annual growth rate of 3.2 percent.

A selected forecast was derived from these projections. The selected based aircraft forecast is shown on **Exhibit 2B** compared to the previous projections as well as the updated projections. The selected forecast has based

aircraft growing to 266 by 2012, 296 by 2017, and 369 by 2027, at an average annual growth rate of 2.2 percent. Short term based aircraft growth will be limited due to current economic conditions; however, after 2012 it is anticipated that the airport will begin shifting to grow its market share closer to historic trends. The selected based aircraft forecast was formulated to take into account growth in market share that is likely to occur at Ryan Airfield over the planning period. Also, the demand for aircraft storage hangar facilities at Ryan Airfield is high which indicates that aircraft owners in the County wish to base their aircraft at Ryan Airfield, and will in the future if facilities are developed. Currently, undeveloped airport property that could be developed into hangar facilities in the future is

plentiful; therefore, this assumption is reasonable.

BASED AIRCRAFT FLEET MIX

The based aircraft fleet mix at Ryan Airfield, as shown on **Table 2E**, was compared to the existing and forecast U.S. general aviation fleet mix trends as presented in *FAA Aerospace Forecasts Fiscal Years 2009-2025*. The FAA expects business jets will continue to be the fastest growing general aviation aircraft type in the future. The number of business jets in the industry fleet is expected to almost double in the next 14 years. VLJ aircraft may still have a boosting affect on turbine aircraft sales as well. The affordability and versatility of this aircraft will make them attractive to corporations and small business owners.

TABLE 2E Based Aircraft Mix Forecast Ryan Airfield								
	Current		2012		2017		2027	
	Number	%	Number	%	Number	%	Number	%
RYAN AIRFIELD Based Aircraft								
Single Engine Piston	223	92.1	241	90.6	265	89.5	322	87.3
Multi-Engine Piston	13	5.4	14	5.3	15	5.1	19	5.1
Turboprop	2	0.8	4	1.5	6	2.0	12	3.3
Jet	1	0.4	3	1.1	5	1.7	10	2.7
Rotorcraft	3	1.2	4	1.5	5	1.7	6	1.6
Totals	242	100.0%	266	100.0%	269	100.0%	369	100.0%
U.S. Active Aircraft (from FAA Aerospace Fiscal Years [2009-2025])								
Single Engine Piston	177,655	75.9%	181,640	74.7	187,525	73.6	202,025	72.0
Multi-Engine Piston	19,130	8.2%	18,455	7.6	17,540	6.9	15,636	5.6
Turboprop	9,600	4.1%	10,015	4.1	10,935	4.3	12,565	4.5
Jet	11,400	4.9%	14,710	6.0	18,635	7.3	27,082	9.6
Rotorcraft	10,215	4.4%	12,260	5.0	14,220	5.6	17,493	6.2
Other	6,015	2.6%	6,090	2.5	6,040	2.4	5,975	2.1
Totals	234,015	100.0%	243,170	100.0%	254,895	100.0%	280,776	100.0%
Note: Experimental and sport aircraft are included under single engine piston. Total percentages may not equal 100 due to rounding.								

Single engine piston aircraft (including sport aviation and experimental

aircraft), helicopter, and turboprop aircraft are expected to grow at slower

rates. The number of multi-engine piston aircraft in the U.S. will actually decline slightly as older aircraft are retired, according to the FAA forecasts.

GENERAL AVIATION OPERATIONS

General aviation operations are classified by the airport traffic control tower (ATCT) as either local or itinerant. A local operation is a take-off or landing performed by an aircraft that operates within sight of the airport, or which executes simulated approaches or touch-and-go operations at the airport. Itinerant operations are those performed by aircraft with a specific ori-

gin or destination away from the airport. Generally, local operations are characterized by training operations. Typically, itinerant operations increase with business and commercial use, since business aircraft are operated on a higher frequency.

ITINERANT OPERATIONS

Table 2F depicts general aviation itinerant operations as counted by the ATCT at Ryan Airfield since 1997. Between 1997 and 2008, itinerant GA operations increased from 41,206 to 75,013 in 2007; however, a significant decrease was experienced in 2008 as itinerant operations dropped to 59,930.

TABLE 2F					
General Aviation Itinerant Operations Forecast					
Ryan Airfield					
Year	Itinerant Operations	U.S. ATCT GA Itinerant (millions)	Ryan Market Share	Ryan Based Aircraft	Itinerant Ops Per Based Aircraft
1997	41,206	21.70	0.190%	250	165
2000	53,495	22.84	0.234%	253	211
2005	55,570	19.32	0.288%	255	218
2007	75,013	18.58	0.404%	301	249
2008	59,930	17.37	0.345%	242	248
Constant Market Share Projection					
2012	57,077	16.54	0.345%	266	215
2017	61,642	17.86	0.345%	296	176
2022	66,470	19.26	0.345%	330	163
2027	73,100	21.18	0.345%	369	154
Operations Per Based Aircraft Projection					
2012	66,500	16.54	0.402%	266	250
2017	81,400	17.86	0.456%	296	275
2022	99,000	19.26	0.663%	330	300
2027	119,925	21.18	0.785%	369	325
FAA-TAF Projection*					
2012	66,577	16.54	0.402%	293	227
2017	71,559	17.86	0.401%	326	220
2022	77,268	19.26	0.401%	363	213
2027	83,430	21.18	0.394%	405	206
Master Plan Forecast					
2012	61,000	16.54	0.369%	266	229
2017	70,500	17.86	0.395%	296	238
2022	81,500	19.26	0.423%	330	247
2027	100,000	21.18	0.472%	369	271
* 2027 FAA-TAF projections were extrapolated by Coffman Associates					

Ryan Airfield's market share as a percentage of GA itinerant operations at towered airports across the country rose sharply from 1997 (0.190 percent) through 2008 (0.345 percent).

In *FAA Aerospace Forecasts Fiscal Years 2009-2025*, the FAA projects itinerant general aviation operations at towered airports. **Table 2F** presents this forecast, as well as a projection for Ryan Airfield, based upon maintaining its current share of the itinerant operations market. Current FAA forecasts do take into consideration the current recession.

The table also examines the relationship of annual operations to based aircraft. Itinerant operations per based aircraft grew from a low of 165 in 1997 to 248 in 2008.

The market share of itinerant operations can be expected to maintain at least its current level. This forecast has itinerant operations exceeding 73,000 by 2027. The second projection in **Table 2F** reflects the itinerant operational levels that could be expected if the operations per based aircraft ratio were to continue to increase into the future, reflecting the historical trend. This forecast results in 119,925 itinerant operations in 2027.

Based upon current economic conditions and historic trends at Ryan Airfield, it is likely that itinerant operations per based aircraft will remain static in the short term. After economic conditions begin to improve, itinerant operations should begin to increase. The

resulting forecast is included at the bottom of **Table 2F**.

As can be seen from the table, the Master Plan forecast is higher than the FAA TAF by 2027. This difference is a result of a faster growth rate beginning in the intermediate term through the long term in this master plan forecast. As the airport facilities and services improve over the planning period and as the City of Tucson grows closer to the airport, it can be expected that more itinerant GA aircraft will choose to utilize Ryan Airfield over other airports in the region.

LOCAL OPERATIONS

A similar methodology was utilized to forecast local operations. **Table 2G** depicts the history of local operations at Ryan Airfield and examines its historic market share of GA local operations at towered airports in the United States. Local operations grew by more than 93,000 between 1997 (81,760) and 2007 (171,410). A flight school operating at Ryan Airfield ceased operations in 2008 resulting in a decrease in local operations.

Historically, the market share has grown from 0.539 percent to 0.749 percent. **Table 2G** presents a market share projection based upon carrying forward a constant share of 0.749 percent. This projection results in 107,993 local GA operations by 2027.

Local operations per based aircraft have also increased over time from 327 in 1997, to 431 in 2008, with a

high of 569 in 2007. Again, this drop in activity is attributable to the loss of flight school operations. Flight school activity at Ryan Airfield has been historically cyclical; however, at this point it is uncertain whether the airport will regain a flight school. The

second projection in **Table 2G** examines increasing local operations per based aircraft after 2012, to levels that can be anticipated if a flight school is established at Ryan Airfield after 2012. This projection results in 162,360 local operations by 2027.

TABLE 2G					
General Aviation Local Operations Forecast					
Ryan Airfield					
Year	Local Operations	U.S. ATCT GA Local (millions)	Ryan Market Share	Ryan Based Aircraft	Local Ops Per Based Aircraft
1997	81,760	15.16	0.539%	250	327
2000	119,796	17.03	0.703%	253	474
2005	100,486	14.85	0.677%	255	394
2007	171,410	14.83	1.156%	301	569
2008	104,262	13.92	0.749%	242	431
<i>Constant Market Share Projection</i>					
2012	99,103	13.23	0.749%	266	373
2017	100,431	13.41	0.749%	296	287
2022	102,782	13.72	0.749%	330	252
2027	107,993	14.42	0.749%	369	227
<i>Operations Per Based Aircraft Projection</i>					
2012	114,646	13.23	0.866%	266	431
2017	128,760	13.41	0.960%	296	435
2022	144,210	13.72	1.051%	330	437
2027	162,360	14.42	1.126%	369	440
<i>FAA-TAF Projection*</i>					
2012	144,253	13.23	1.090%	293	492
2017	162,944	13.41	1.215%	326	500
2022	184,059	13.72	1.341%	363	507
2027	207,914	14.42	1.442%	405	513
<i>Master Plan Forecast</i>					
2012	107,000	13.23	0.809%	266	402
2017	119,500	13.41	0.891%	296	404
2022	133,000	13.72	0.969%	330	403
2027	150,000	14.42	1.040%	369	407
*2027 FAA-TAF projections were extrapolated by Coffman Associates					

Due to economic conditions and the uncertainty that a flight school will operate at Ryan Airfield in the future, local operations are projected to grow slower than itinerant operations. The master plan forecast of local operations is depicted at the bottom of **Table 2G**.

The FAA TAF forecasts are also presented on **Table 2G**. The master plan forecast is lower in the long term range reflecting the lack of a flight school and the uncertainty of whether a flight school will conduct operations at Ryan Airfield in the future.

GENERAL AVIATION OPERATIONS SUMMARY

Table 2H depicts historical general aviation operations as counted by the ATCT at Ryan Airfield since 1997, as well as the updated Master Plan projections. **The operational forecasts have been adjusted downward to reflect the current economic climate and loss of flight school activity.** Total general aviation operations are projected to reach 168,000 in the short term at an average annual growth rate of 0.6 percent. Beyond

2012, total general aviation operations are forecast grow 2.7 percent annually through 2027 reflecting the return to historic growth rates. **Exhibit 2C** depicts a chart of the general aviation operations projections broken down by itinerant, and local through the planning period compared to the 1999 *Ryan Airfield Master Plan* forecasts and the 2008 FAA TAF. **Exhibit 2C** depicts a chart of total general aviation operations projections compared to the 1999 *Ryan Airfield Master Plan* and the 2008 FAA TAF forecasts.

TABLE 2H						
General Aviation Operations Forecast Summary						
Ryan Airfield						
Year	Total Operations	Itinerant Operations	Local Operations	Based Aircraft	Itinerant Ops/BA	Local Ops/BA
1997	122,966	41,206	81,760	250	165	327
1998	157,072	50,101	106,971	234	214	457
1999	138,111	46,845	91,266	253	185	361
2000	173,291	53,495	119,796	253	211	474
2001	145,761	51,073	94,688	N/A	N/A	N/A
2002	142,405	48,300	94,105	N/A	N/A	N/A
2003	129,889	47,307	82,582	259	183	319
2004	154,723	53,462	101,261	N/A	N/A	N/A
2005	156,056	55,570	100,486	255	218	394
2006	199,104	60,775	138,329	260	234	532
2007	246,423	75,013	171,410	301	249	569
2008	164,192	59,930	104,262	242	248	431
Forecast						
2012	168,000	61,000	107,000	266	229	402
2017	190,000	70,500	119,500	296	238	404
2022	214,500	81,500	133,000	330	247	403
2027	250,000	100,000	150,000	369	271	401

MILITARY

Military operations account for the smallest portion of the operational traffic at Ryan Airfield. Due to Ryan Airfield's proximity to Davis Monthan Air Force Base, as well as several military operating areas (MOAs), military activity has fluctuated between 1,000 and 4,500 operations annually between 1997 and 2008. Unless there is an unforeseen mission change in the area, a significant change from these military operational levels is not anticipated. Therefore, annual military operations have been projected at 3,500 throughout the planning period. This is consistent with typical industry practices for projecting military operations. Military operational history

between 1997 and 2008. Unless there is an unforeseen mission change in the area, a significant change from these military operational levels is not anticipated. Therefore, annual military operations have been projected at 3,500 throughout the planning period. This is consistent with typical industry practices for projecting military operations. Military operational history

and projections are presented in **Table 2J**.

TABLE 2J			
Military Operations			
Ryan Airfield			
Year	Itinerant	Local	Total
1997	664	494	1,158
1998	659	509	1,168
1999	987	2,261	3,248
2000	657	410	1,067
2001	783	453	1,236
2002	754	616	1,370
2003	1,205	1,247	2,452
2004	1,833	1,942	3,775
2005	2,175	2,380	4,555
2006	1,934	1,438	3,372
2007	1,431	1,547	2,978
2008	1,840	1,920	3,760
Forecast			
2012	1,750	1,750	3,500
2017	1,750	1,750	3,500
2022	1,750	1,750	3,500
2027	1,750	1,750	3,500

ANNUAL INSTRUMENT APPROACHES (AIAs)

Forecasts of annual instrument approaches provide guidance in determining an airport's requirements for navigational aid facilities. An instrument approach as defined by the FAA is "an approach to an airport with 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."

Data on instrument approaches to Ryan Airfield since 1994 were examined. True instrument weather

conditions are not a common occurrence at Ryan Airfield. In fact, most years conclude with no AIAs being reported. The highest AIAs reported occurred in 2001 with six. Based on this historical data, AIAs are forecast to remain below 100 operations annually through the planning period.

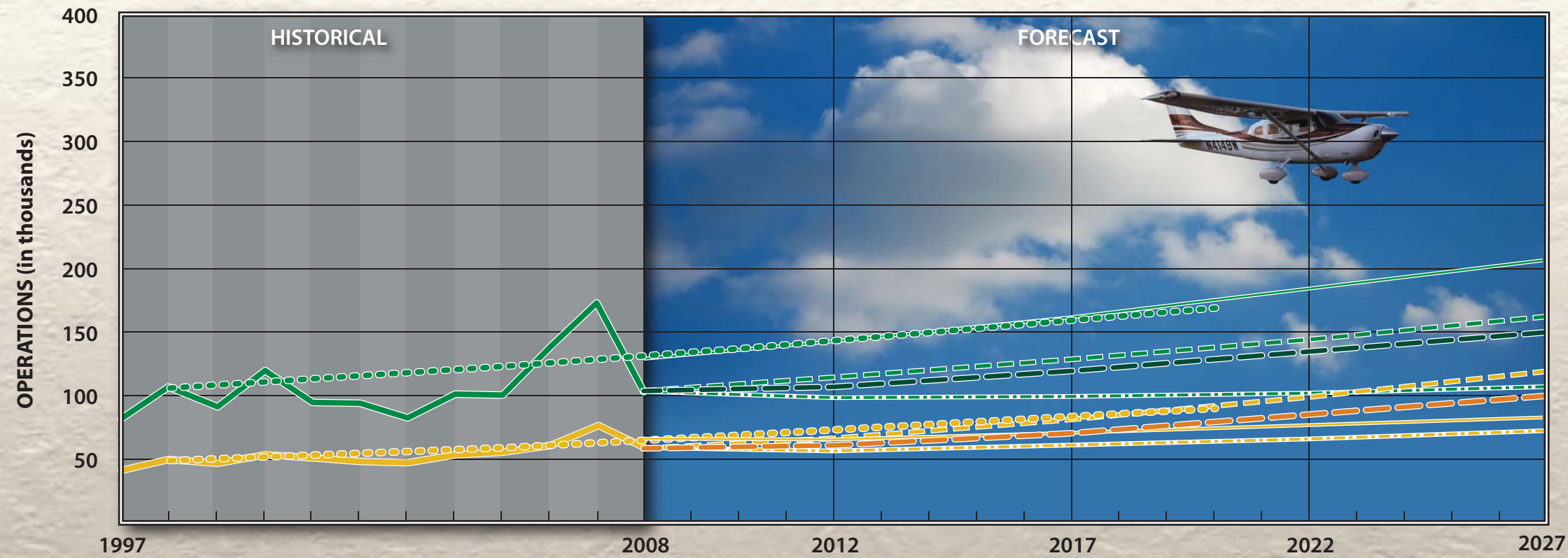
SUMMARY

This chapter has outlined the various activity levels that might reasonably be anticipated over the planning period. **Exhibit 2D** is a summary of the aviation forecasts prepared in this chapter. Actual activity is included for 2008, which was the base year for these forecasts.

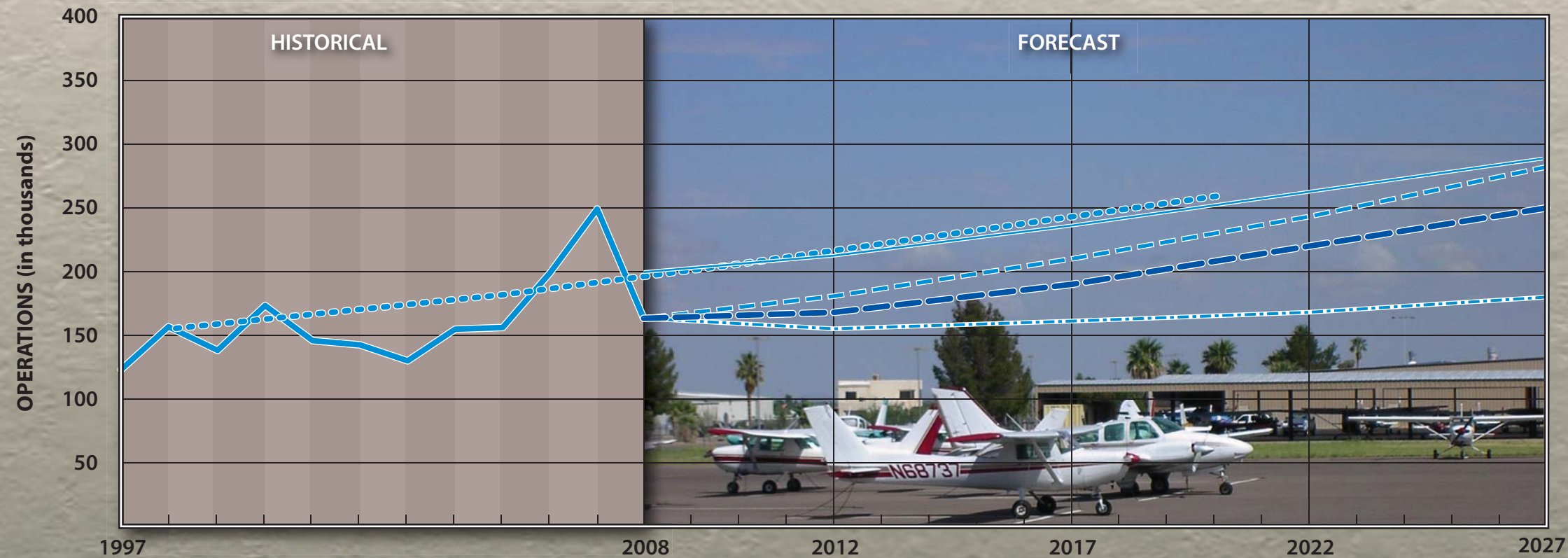
Based aircraft at Ryan Airfield are expected to see steady growth over the planning period, but the extent of that growth will be dependent upon the availability of services and facilities (especially hangars) in the future.

The next step in the planning process is to assess the capabilities of the existing facilities to determine what upgrades may be necessary to meet future demands. The forecasts developed here will be taken forward in the next chapter as planning horizon activity levels that will serve as milestones or activity benchmarks in evaluating facility requirements. Peak activity characteristics will also be determined for the various activity levels for use in determining facility needs.

GENERAL AVIATION ITINERANT AND LOCAL OPERATIONS FORECAST



GENERAL AVIATION TOTAL OPERATIONS FORECAST



2008**2012****2017****2022****2027****OPERATIONS FORECASTS**

Itinerant Operations					
General Aviation	59,930	61,000	70,500	81,500	100,000
Military	1,840	1,750	1,750	1,750	1,750
<i>Total Itinerant</i>	<i>61,770</i>	<i>62,750</i>	<i>72,250</i>	<i>83,250</i>	<i>101,750</i>
Local Operations					
General Aviation	104,262	107,000	119,500	133,000	150,000
Military	1,920	1,750	1,750	1,750	1,750
<i>Total Local</i>	<i>106,182</i>	<i>108,750</i>	<i>121,250</i>	<i>134,750</i>	<i>151,750</i>
Total Operations	167,952	171,500	193,500	218,000	253,500

BASED AIRCRAFT FORECASTS

Single Engine Piston	223	241	265	292	322
Multi-engine Piston	13	14	15	17	19
Turboprop	2	4	6	9	12
Jet	1	3	5	7	10
Rotorcraft	3	4	5	5	6
Total Based Aircraft	242	266	296	330	369



RYAN
AIRFIELD
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