

Forecasts

An important factor in facility planning begins with a definition of demand that may reasonably be expected to occur during the useful life of its key components. In airport master planning, this involves projecting potential aviation activity over at least a twenty-year timeframe. For a general aviation reliever airport such as Phoenix Deer Valley Airport (DVT), forecasts of based aircraft and operations (takeoffs and landings) serve as the basis for facility planning.

FAA Advisory Circular 150/5070-6A outlines six standard steps involved in the forecast process, including:

- 1) Obtain existing FAA and other related forecasts for the area served by the airport.
- 2) Determine if there have been significant local conditions or changes in the forecast factors.
- 3) Make and document any adjustments to the aviation activity forecasts.
- 4) Where applicable, consider the effects of changes in uncertain factors affecting demand for airport services.
- 5) Evaluate the potential for peak loads within the overall forecasts of aviation activity.
- 6) Monitor actual activity levels over time to determine if adjustments are necessary in the forecasts.



Aviation activity can be affected by many influences on the local, regional, and national level, making it virtually impossible to predict year-to-year fluctuations of activity over twenty years with any certainty into the future. Therefore, it is important to remember that forecasts are to serve only as guidelines, and planning must remain flexible enough to respond to a range of unforeseen developments.

The following forecast analysis examines recent developments, historical information, and current aviation trends to provide an updated set of aviation-demand projections for DVT. The intent is to permit the Phoenix Aviation Department to make planning adjustments as necessary to ensure that the facility meets projected demands in an efficient and cost-effective manner.

NATIONAL AVIATION TRENDS

Each year, the Federal Aviation Administration (FAA) updates and publishes a national aviation forecast. Included in this publication are forecasts for air carriers, regionals/commuters, general aviation, and FAA workload measures. The forecasts are prepared to meet budget and planning needs of the constituent units of the FAA and to provide information that can be used by state and local authorities, the aviation industry, and the general public. The current edition when this chapter was prepared was *FAA Aerospace Forecasts - Fiscal Years 2004-2015*, published in March 2004. The forecasts use the economic perform-

ance 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.

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 September 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. Some U.S. airports in and around Washington, D.C. and New York City remain closed to visual flight rules (VFR) traffic. This, in addition to the economic recession that began in early 2001, has had a negative impact on the general aviation industry.

While the recession ended a seven-year period of growth in the aviation industry, it was early in 2002 before the severity of the recession was realized. The domestic economy declined

for three consecutive quarters in 2001. In 2002, the recovery was underway, although weak, but has picked up in the last two years. The FAA expects the U.S. economy to continue to recover strongly through 2005, then grow moderately thereafter. This will positively influence the aviation industry, leading to passenger, air cargo, and general aviation growth throughout the forecast period (assuming that there will not be any new successful terrorist incidents against either U.S. or world aviation).

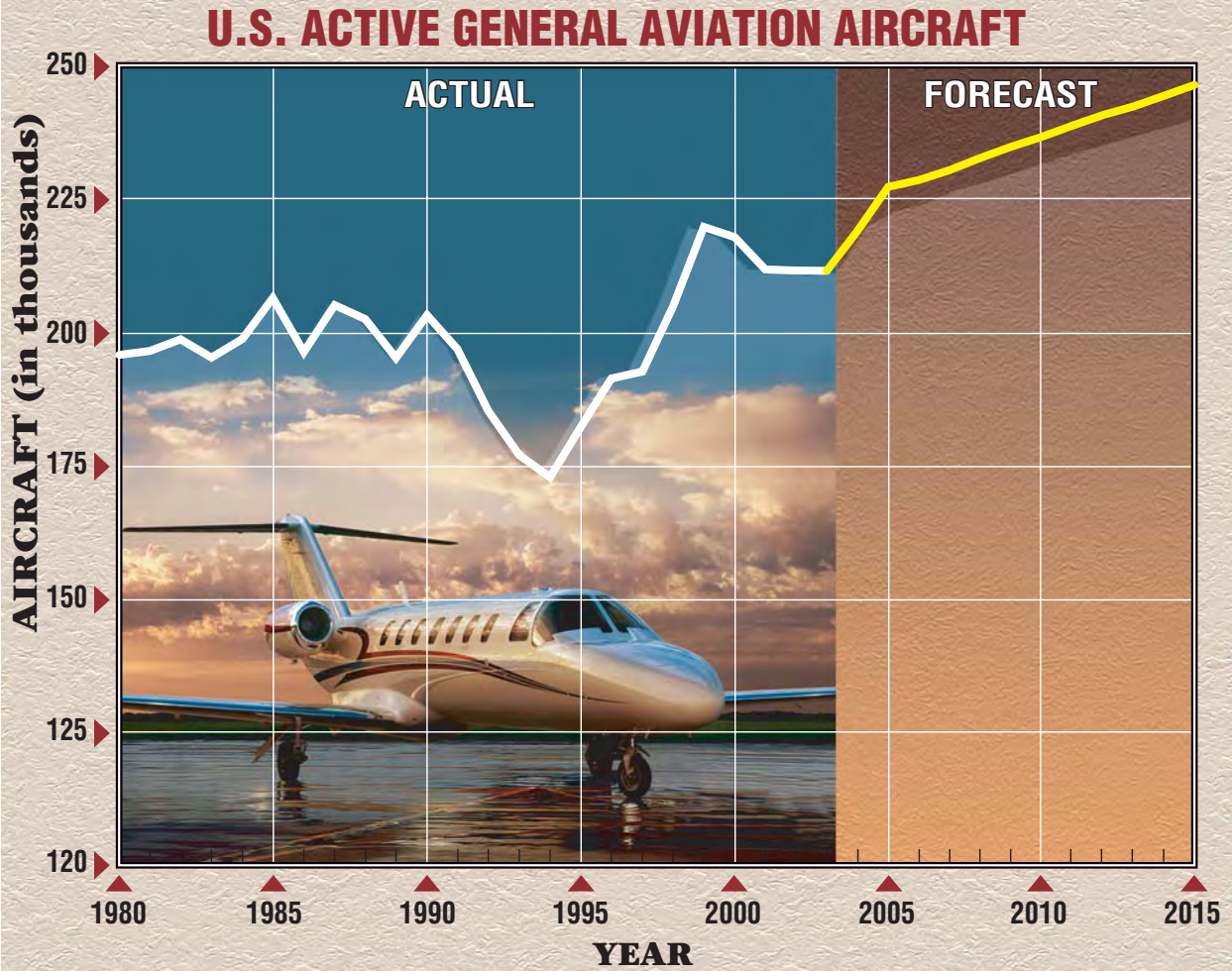
According to the General Aviation Manufacturers Association (GAMA), aircraft shipments in the first three quarters of 2004 were up 7.7 percent from 2003. This followed a static level of growth between 2002 and 2003. The number of general aviation hours flown also remained static in 2003.

After a recent slowdown in business jet shipments (down 31.9 percent in 2003), the business/corporate segment of general aviation began to grow again in 2004 and offers the most growth potential. For the first three quarters of 2004, business jet shipments were up 10.4 percent. The FAA expects this segment will continue to expand at a faster rate than personal/sport flying. Safety concerns combined with increased processing time at commercial terminals make business/corporate flying an attractive alternative. In addition, the bonus depreciation provision of the President's economic stimulation package should help business jet sales even more, late in 2004.

In 2003, there were an estimated 211,190 active general aviation aircraft, representing an increase of 150 aircraft (0.07 percent). **Exhibit 2A** depicts the FAA forecast for active general aviation aircraft in the United States. The FAA forecasts general aviation aircraft to increase at an average annual rate of 1.3 percent over the 12-year forecast period, to 246,415. Piston-powered aircraft are expected to grow at an average annual rate of 0.2 percent. This is due, in part, to declining numbers of multi-engine piston aircraft, while single-engine and rotorcraft increase at rates of 0.3 and 1.0 percent, respectively.

Turbine-powered aircraft (turboprop and jet) are expected to grow at an average annual rate of 3.1 percent over the forecast period. Even more significantly, the jet portion of this fleet is expected to grow at an average annual growth rate of 5.1 percent. This growth rate for jet aircraft can be attributed to growth in the fractional ownership industry, new product offerings (which include new entry-level aircraft and long-range global jets), and the shift away from commercial travel by many travelers and corporations.

In summary, business aviation, by nature of its ownership and use, will experience cyclical movements in activity relating to economic conditions. Over the long term, however, it is anticipated to continue to be the strongest growth market in general aviation.



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

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

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

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



STATE AND REGIONAL TRENDS

The Arizona Department of Transportation (ADOT) Aeronautics Division assists airports in the state in identifying infrastructure needs with a state aviation needs study and other special aviation studies. The most recent study on a statewide basis is the *State Aviation Needs Study (SANS) - 2000*. The SANS 2000 includes forecasts of aviation activity in the state. The Maricopa Association of Governments (MAG) is charged with preparing and updating a *Regional Airport System Plan (RASP)* for the Phoenix metropolitan area. The most recent aviation forecasts for the MAG-RASP were prepared in late 2001, after the events of September 11. They were adopted by MAG in 2003.

Table 2A depicts the based aircraft forecasts prepared from the SANS 2000 for the State and Maricopa County. The base year for these forecasts was 1998. The SANS 2000 forecast that based aircraft in the state would grow at an annual average rate of 1.3 percent through 2020. This is well above the 0.7 percent that the FAA projects for active aircraft nationwide.

The percentage of Arizona-based aircraft in Maricopa County was actually

forecast to decline over the years from 57.6 percent in 1998 to 54.8 percent in 2020. Thus, the average growth rate for based aircraft in Maricopa County was projected to be slightly lower, at 1.2 percent.

Table 2A also presents the more recent forecast of Maricopa County based aircraft prepared for the MAG-RASP. The base year for this forecast was 2000. As evident from the table, based aircraft in Maricopa County increased by 12 percent between 1998 and 2000. In fact, the actual based aircraft in 2000 were more than the SANS 2000 forecast for 2010.

As could be expected, the MAG-RASP forecast of based aircraft is higher. This forecast projects total based aircraft in the region to reach 7,612 by 2025. This would be an annual average increase of 2.1 percent, significantly stronger than the national or statewide growth rates projected by FAA and ADOT, respectively.

Keeping in line, the MAG-RASP projects fixed-wing turbine aircraft based in the county to grow from 170 in 2000, to 427 by 2025. This would be an increase of 151 percent (3.75 percent annually). Turbine aircraft would also grow as a percentage of all based aircraft from 3.9 percent in 2000, to 9.3 percent in 2025.

	Base Year*	2005	2010	2015	2020	2025
SANS 2000						
Arizona	6,700	7,156	7,674	8,247	8,896	NA
Maricopa County	3,857	4,065	4,303	4,568	4,877	NA
MAG-RASP						
Maricopa County	4,317	4,820	5,517	6,215	6,913	7,612

Sources: *State Aviation Needs Study – 2000*; ADOT, 1999.
Regional Airport System Plan; Maricopa Council of Governments, 2001.

* Base Year: SANS – 1998; MAG-RASP – 2000.

SERVICE AREA

The generalized service area of an airport is defined by its proximity to other airports providing similar service. Phoenix Deer Valley Airport is one of several airports serving the general aviation needs of the Phoenix metropolitan area.

Exhibit 2B depicts DVT in relationship to other airports that serve the North Valley. The airports with comparable capabilities are Scottsdale

Airport (SDL) to the east, Phoenix Sky Harbor Airport (PHX) to the south, and Glendale Municipal Airport (GEU) to the southeast.

Sky Ranch is a smaller, privately-owned general aviation airport located to the northeast in Carefree. Similarly, Pleasant Valley Airport is another private airport located to the west in Peoria. **Table 2B** compares the runway lengths and based aircraft of these airports to DVT.

Name	Longest Runway (ft.)	Approach Minimums (feet-miles)	Based Aircraft	2004 Annual Operations*
Scottsdale	8,249	700 – 1 ¾	460	202,681
Phoenix Deer Valley	8,208	600 – 1 ½	1,252	340,437
Phoenix Sky Harbor ¹	11,490	200 – ½	237	599,105
Glendale Municipal	7,150	500 – 1 ¼	269	118,140
Sky Ranch (private)	4,037	VFR	115	4,200
Pleasant Valley (private)	4,200	VFR	61	76,200

* Tower counts, except for Sky Ranch and Pleasant Valley, which are estimates from FAA Form 5010.

¹ Phoenix Sky Harbor general aviation operations totaled 100,818 in 2004.

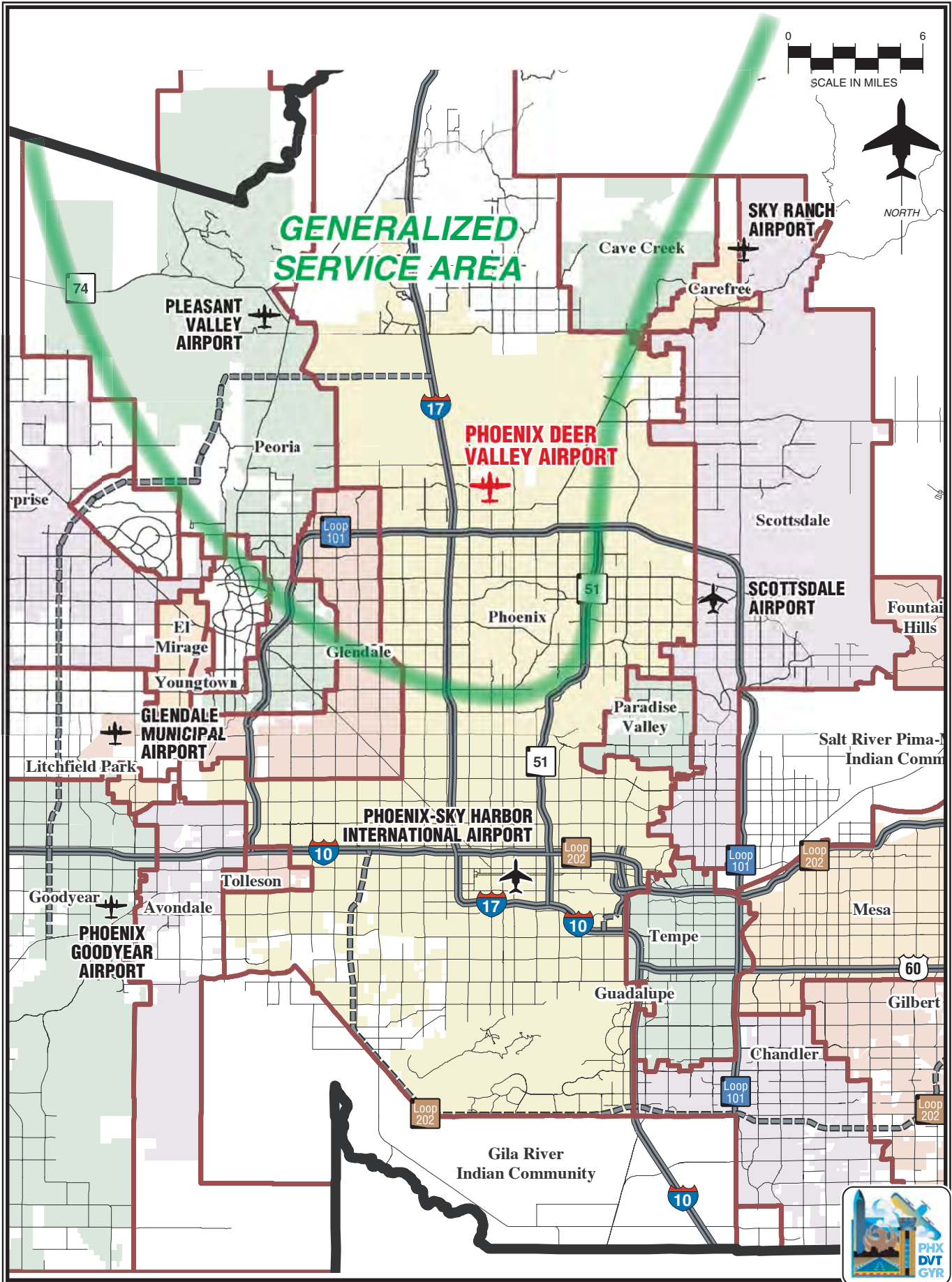


Exhibit 2B
GENERALIZED SERVICE AREA

These six airports base a total of 2,394 aircraft. Phoenix Deer Valley Airport has the most with 1,252 based aircraft, more than the other five combined. Phoenix Sky Harbor International Airport (PHX) had the most annual operations in 2004 with 599,105. DVT was next at 340,437. As the commercial service airport for the Phoenix metropolitan area, however, PHX had just 100,818 general aviation operations in 2004. Both of these airports have parallel runways available, allowing them to better accommodate higher traffic levels than the other four airports.

The MAG-RASP has considered alternatives for developing new airports in the north valley. There are no specific sites, but the MAG-RASP includes a potential new general aviation airport in an area east of Fountain Hills in the vicinity of Highway 87, and northeast of the Salt River-Maricopa Indian Community. The study recognized an airport in this area would have only moderate potential for implementation because of the location in the Tonto National Forest and the proximity to Indian communities.

Considerations to the northwest include either the expansion of the Pleasant Valley Airport or a replacement airport in that same general area. A draft study was prepared for the City of Peoria in 2000 which recommended improvement of the existing private airport, but that study was tabled and has never been adopted.

Based upon the proximities of the other three public airports listed above, the primary service area for Phoenix Deer Valley Airport is generally comprised of northern Phoenix, Cave Creek, as well as portions of northern Glendale and Peoria. As shown on **Table 2C**, the population of this area totaled 575,801 in 2000. This represented 18.7 percent of the population of Maricopa County. **Table 2D** indicates that employment in the Deer Valley primary service area was 212,460 in 2000, or 13.6 percent of the total employment in Maricopa County.

In July of 2003, the MAG Regional Council adopted a new set of population, housing, and employment forecasts for the county. This included not only the county total, but a breakdown of sub-areas as well. **Tables 2C** and **2D** also present the population and employment forecasts for the various areas included in the Phoenix Deer Valley Airport service area, as well as Maricopa County total.

Population and employment are projected to increase through 2010 at average annual rates of 2.6 percent and 2.9 percent, respectively. The growth rates increase slightly between 2010 and 2020, to 2.8 and 3.0 percent annually. Between 2020 and 2025, the average annual growth rate for population slows to 1.5 percent for population and increases to 3.1 percent for employment.

TABLE 2C				
Population Forecasts for the Primary Service Area				
Phoenix Deer Valley Airport				
	Actual	Forecast		
	2000	2010	2020	2025
North Phoenix	447,491	574,761	764,748	812,330
Cave Creek	3,728	5,110	5,764	9,787
North Glendale	89,512	99,667	101,609	102,006
North Peoria	35,070	63,327	107,362	132,515
Total	575,801	742,865	979,483	1,056,638
Avg. Annual % Change	NA	2.6%	2.8%	1.5%
Maricopa County	3,072,149	4,134,388	5,164,142	5,663,999
Area % of County	18.7%	18.0%	19.0%	18.7%

Source: Interim Projections of Population, Housing, and Employment, Maricopa Association of Governments, July 2003.

TABLE 2D				
Employment Forecasts				
Phoenix Deer Valley Airport Service Area				
	2000	2010	2020	2025
	North Phoenix	169,981	217,307	284,503
Cave Creek	813	1,890	2,147	2,865
North Glendale	33,876	47,117	49,739	49,711
North Peoria	7,790	16,297	45,519	68,723
Total	212,460	282,611	381,908	444,108
Avg. Annual % Change	NA	2.9%	3.0%	3.1%
Maricopa County	1,564,836	2,112,000	2,705,000	3,002,000
Area % of County	13.6%	13.4%	14.1%	14.8%

Source: Interim Projections of Population, Housing, and Employment, Maricopa Association of Governments, July 2003.

The percentage of the county population in the DVT service area is projected to remain relatively constant over the entire forecast period. Thus, population in the area is expected to grow at a rate similar to that of the entire County. The percentage of county employment in the DVT service area will actually increase slightly, indicating that employment will more than keep pace with population growth in this area.

BASED AIRCRAFT

The number of based aircraft is one of the most basic indicators of general aviation demand. By first developing a forecast of based aircraft, the growth of other general aviation activities and demands can be projected.

Table 2E presents a history of based aircraft at DVT, dating back to 1983. As graphically depicted on **Exhibit**

2C, the based aircraft totals at DVT have effectively doubled over the past two decades.

Year	Total Aircraft
1983	657
1984	669
1985	638
1986	764
1987	754
1988	716
1989	637
1990	815
1991	778
1992	796
1993	805
1994	803
1995	898
1996	903
1997	918
1998	912
1999	918
2000	1,206
2001	1,046
2002	1,275
2003	1,250
2004	1,252

*Sources: Phoenix Aviation Department;
Maricopa Association of Governments (MAG)*

Table 2F compares the based aircraft at each of the airports (public and private) serving the North Valley over the last ten years. The total number of based aircraft at these airports has increased by 43 percent since 1994. Phoenix Sky Harbor International Airport has experienced minimal change in based aircraft because it is the air carrier airport for the region.

Scottsdale Airport's growth of 17 percent over this time period was the next slowest. Scottsdale Airport has very limited undeveloped area both on and

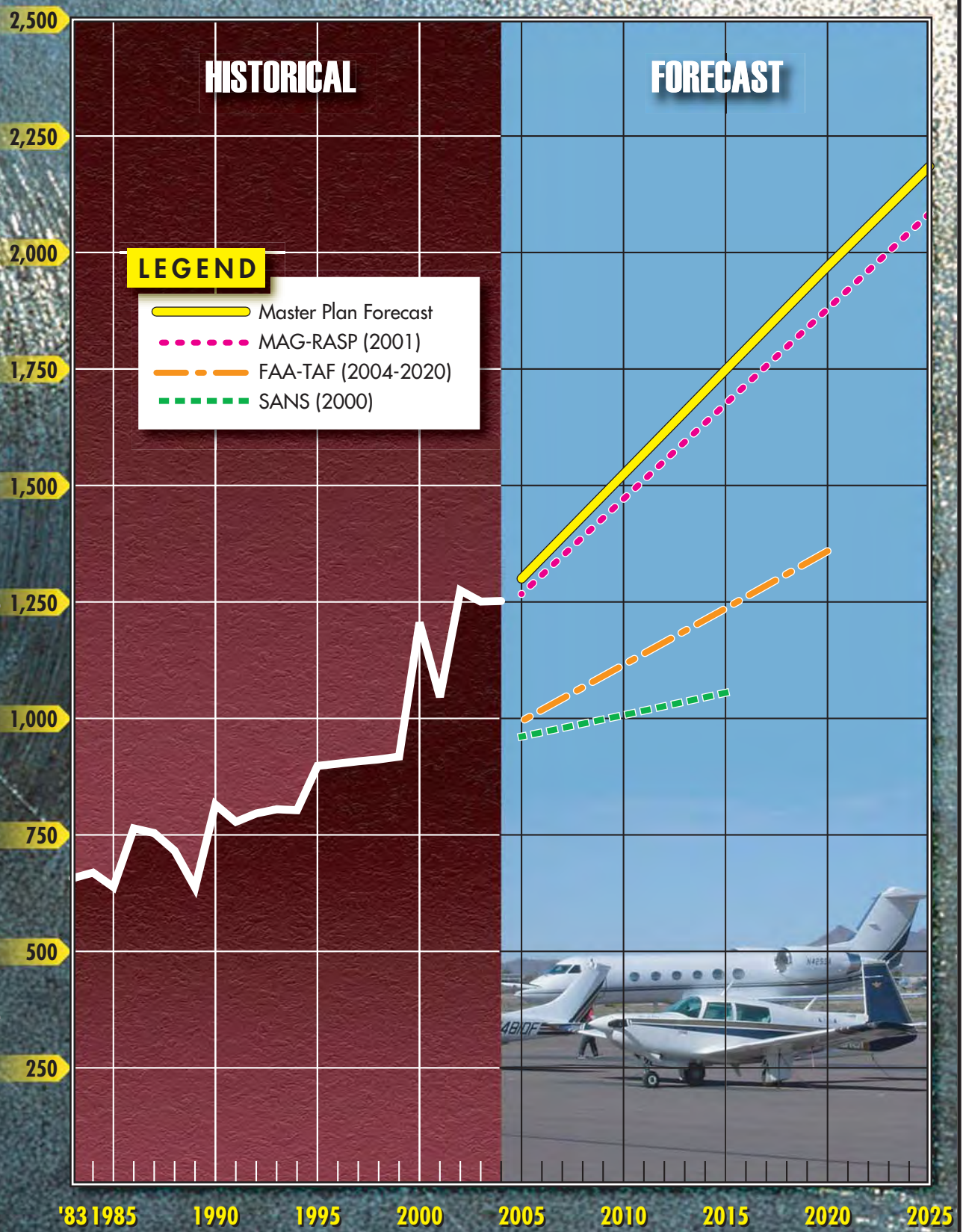
around the airport. Thus, space for aircraft storage is at a premium. The based aircraft growth the airport has seen in the last 10 years has been in turbine aircraft. In fact, the number of piston-powered fixed-wing aircraft has declined at both Scottsdale and Phoenix Sky Harbor Airports.

Table 2F also presents the MAG-RASP forecasts for each of the airports. As can be seen from the table, the 2005 forecast has already been exceeded for each of the six airports, with the exception of DVT. The MAG-RASP forecast first projected the total aircraft based at public airports in Maricopa County, then distributed these aircraft to the airports within the county. A strong correlation was found between Maricopa County based aircraft and the County's population. Thus, the county-wide based aircraft forecasts were derived from a linear regression, using the county population as the independent variable.

The population forecasts used by the MAG-RASP were prepared in 1997. Those population forecasts for Maricopa County are lower than the recent population forecasts approved by the MAG Council in July of 2003. By comparison, the population forecasts used by the MAG-RASP projected 4.95 million residents in the county by 2025. The updated population forecast expects 5.66 million residents, or 14.4 percent higher than previously forecast.

Since the MAG-RASP found such a high correlation ($r^2 = 0.97$) between population and based aircraft, the regression was updated with additional

BASED AIRCRAFT



based aircraft and population data that has become available since 2000. The correlation coefficient of the expanded historic data remained at 0.97. A new projection utilizing the updated county population forecast was then developed. This resulted in an up-

dated projection of 7,641 based aircraft at the public airports in the county by 2025. This figure is 4.8 percent higher than the MAG-RASP projection. The two projections are compared in **Table 2G**.

TABLE 2F							
Based Aircraft Forecasts							
North Valley Airports							
Maricopa Association of Governments (September 2001)							
Year	Total	Phoenix Deer Valley	Phoenix Sky Harbor	Scottsdale	Glendale	Sky Ranch	Pleasant Valley
ACTUAL							
1994	1,671	803	224	393	178	52	21
1997	1,837	908	265	400	184	54	26
2000	2,205	1,206	237	425	208	84	45
2004	2,394	1,252	237	460	269	115	61
% change 1994-2004	43%	56%	6%	17%	51%	121%	190%
FORECAST							
2005	2,326	1,267	231	427	237	108	56
2015	2,863	1,675	183	450	300	169	86
2025	3,402	2,084	135	473	364	230	116
<i>Source: MAG-RASP, Working Paper No. 2, September 2001</i>							

Exhibit 2C and **Table 2G** outline previous forecasts of based aircraft prepared for Phoenix Deer Valley Airport. The oldest forecast shown is from the SANS 2000 which was prepared in 1998. The MAG-RASP forecast was prepared in 2001. The most current forecast, however, is the FAA *Terminal Area Forecast* (TAF) which was prepared in 2004 and published in January of 2005.

As can be readily seen on the exhibit, the long range (2020) based aircraft forecast from the SANS 2000 has already been exceeded. This forecast is low primarily because the study's overall projection for based aircraft in Maricopa County has proven to be low.

TABLE 2G							
Based Aircraft Forecasts							
Phoenix Deer Valley Airport							
	2000	2004	2005	2010	2015	2020	2025
Maricopa County Based Aircraft Forecasts							
MAG-RASP (2001)	4,133		4,615	5,282	5,950	6,618	7,288
Updated (2004) *	4,133		4,737	5,474	6,211	6,937	7,641
Previous DVT Based Aircraft Forecasts							
Actual	1,206	1,252					
SANS-2000 (1998)			961	1,007	1,055	1,106	
MAG-RASP (2001)	1,206		1,267	1,471	1,675	1,879	2,084
FAA-TAF (2004)	918		994	1,115	1,236	1,359	
Updated DVT Forecast							
Master Plan			1,300	1,524	1,748	1,970	2,185
<i>Percent of Updated County Forecast</i>			27.4%	27.8%	28.2%	28.4%	28.6%

* Update prepared by Coffman Associates to account for additional history and new county population forecasts.

The MAG-RASP projected that Phoenix Deer Valley Airport's market share of based aircraft would be relatively steady at 27.4 percent in 2005, growing slightly to 28.6 percent in 2025. This small growth in the percentage of the market would seem reasonable as the population and employment growth in the North Valley is anticipated to essentially match the growth of Maricopa County as a whole. To adjust the airport's based aircraft to reflect the updated forecast demand for Maricopa County, the MAG-RASP market share percentage forecast was carried forward in the update. The resulting based aircraft forecast is presented on **Table 2G** and **Exhibit 2C** for comparison. The new forecast results in approximately 100

more based aircraft at DVT than the MAG-RASP projected.

The based aircraft fleet mix at Phoenix Deer Valley Airport (**Table 2H**) was compared to the existing and forecast U.S. general aviation fleet mix trends as presented in FAA *Aerospace Forecasts Fiscal Years 2004-2015*. The FAA expects that business jets will be the fastest growing general aviation aircraft type in the future. The number of business jets in the U.S. fleet is expected to nearly double in 10 years and almost triple in 20 years. While single engine piston will continue to dominate the mix at DVT, as it does across the country, business jets are projected to quadruple at the airport over the planning period.

TABLE 2H Based Aircraft Forecast Phoenix Deer Valley Airport								
DVT Based	Current	%	2010	%	2015	%	2025	%
Single Engine Piston	1,086	86.7%	1,318	86.5%	1,501	85.9%	1,855	84.9%
Multi-Engine Piston	111	8.9%	123	8.1%	132	7.6%	144	6.6%
Turboprop	13	1.0%	20	1.3%	28	1.6%	46	2.1%
Jet	26	2.1%	42	2.8%	61	3.5%	104	4.8%
Helicopter	8	0.6%	11	0.7%	14	0.8%	20	0.9%
Other	8	0.6%	10	0.7%	12	0.7%	16	0.7%
Totals	1,252	100.0%	1,524	100.0%	1,748	100.0%	2,185	100.0%
U.S. Active Aircraft (FAA Aerospace Forecasts 2004)								
Single Engine Piston	173,050	79.0%	186,915	78.9%	192,465	78.1%	204,200	76.5%
Multi-Engine Piston	17,420	8.0%	16,910	7.1%	16,490	6.7%	15,800	5.9%
Turboprop	6,900	3.1%	7,580	3.2%	8,120	3.3%	9,700	3.6%
Jet	8,650	3.9%	11,990	5.1%	15,510	6.3%	22,800	8.5%
Helicopter	6,680	3.0%	7,000	3.0%	7,210	2.9%	7,600	2.8%
Other	6,400	2.9%	6,520	2.8%	6,620	2.7%	6,800	2.5%
Totals	219,100	100.0%	236,915	100.0%	246,415	100.0%	266,900	100.0%
Note: Experimental and sport aircraft totals are included under Single Engine Piston.								

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 origin or destination away from the airport. Generally, local operations are characterized by training operations. Typically, itinerant operations increase with business and commercial use.

ITINERANT OPERATIONS

Table 2J depicts the history of general aviation itinerant operations, as counted by the ATCT at DVT since 1990. Itinerant operations increased from 98,693 in 1992, to 164,979 in 2000. The events of September 11, 2001, contributed to that year dropping off from the highs recorded in 2000. Traffic recovered the next year, however, to record the all-time high for the airport at 166,777 itinerant operations. Activity has declined the last two years to 137,550 in 2004.

Year	Itinerant	Local	Total
1990	103,836	171,079	274,915
1991	99,735	159,394	259,129
1992	98,693	117,619	216,312
1993	99,570	103,122	202,692
1994	101,113	104,322	205,435
1995	105,144	106,313	211,457
1996	119,135	127,297	246,432
1997	121,701	140,234	261,935
1998	129,248	147,008	276,256
1999	135,646	144,829	280,475
2000	164,979	198,331	363,290
2001	147,799	185,966	333,765
2002	166,777	217,730	384,507
2003	152,934	232,155	385,089
2004	137,550	189,789	336,339

Source: FAA – Air Traffic Activity Data System (ATADS)

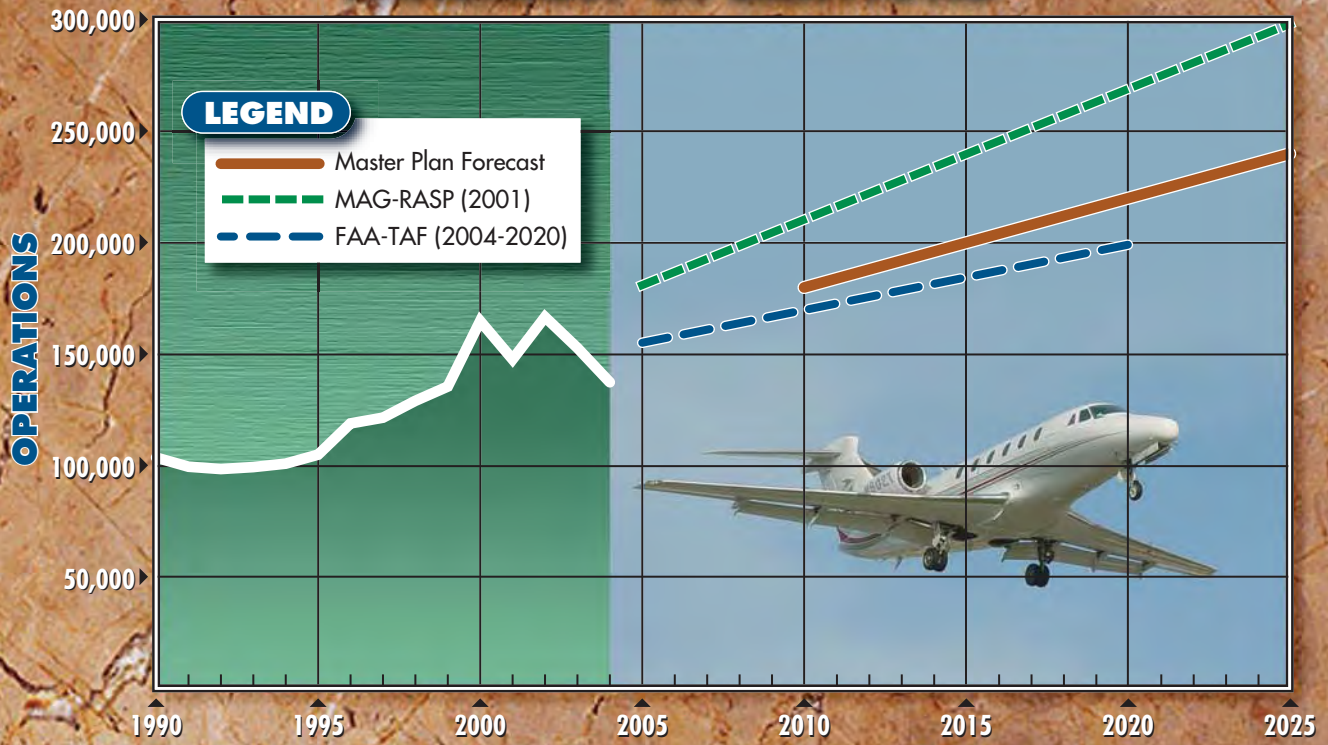
Exhibit 2D and **Table 2K** compare the previous forecasts of general aviation itinerant operations. The MAG-RASP forecasts a strong growth for itinerant operations through 2025. The itinerant operations were directly related to based aircraft growth. Each future year was projected at 143 operations per based aircraft. This resulted in a projection of 297,900 annual itinerant operations by 2025.

The FAA-TAF has the advantage of being the more current forecast and thus has a better consideration for the effects of the post-September 11 period. The FAA-TAF projects general aviation itinerant operations to grow at a slower rate than based aircraft, as the ratio of operations per based aircraft declines slightly over the planning period. This, combined with a lower forecast for based aircraft in the TAF, results in a projection of 199,137 operations by 2020.

Table 2L outlines the history of itinerant operations in relation to the total general aviation itinerant operations at towered airports in the U.S. As with the operations themselves, the DVT market share, as a percentage of general aviation itinerant operations at towered airports across the country, increased from a low of 0.449 percent in 1991, to a high of 0.779 in 2002.

The market share steadily rose through the 1990s but the most significant increase occurred in 2000, the same year that based aircraft at the airport increased by over 30 percent. In 2003, the market share was down slightly to 0.757. While the national tower count was not available at the time of the preparation of this document, DVT itinerant operations in 2004 were down ten percent. This is at least partly due to higher fuel prices during portions of the past year.

ITINERANT OPERATIONS



LOCAL OPERATIONS

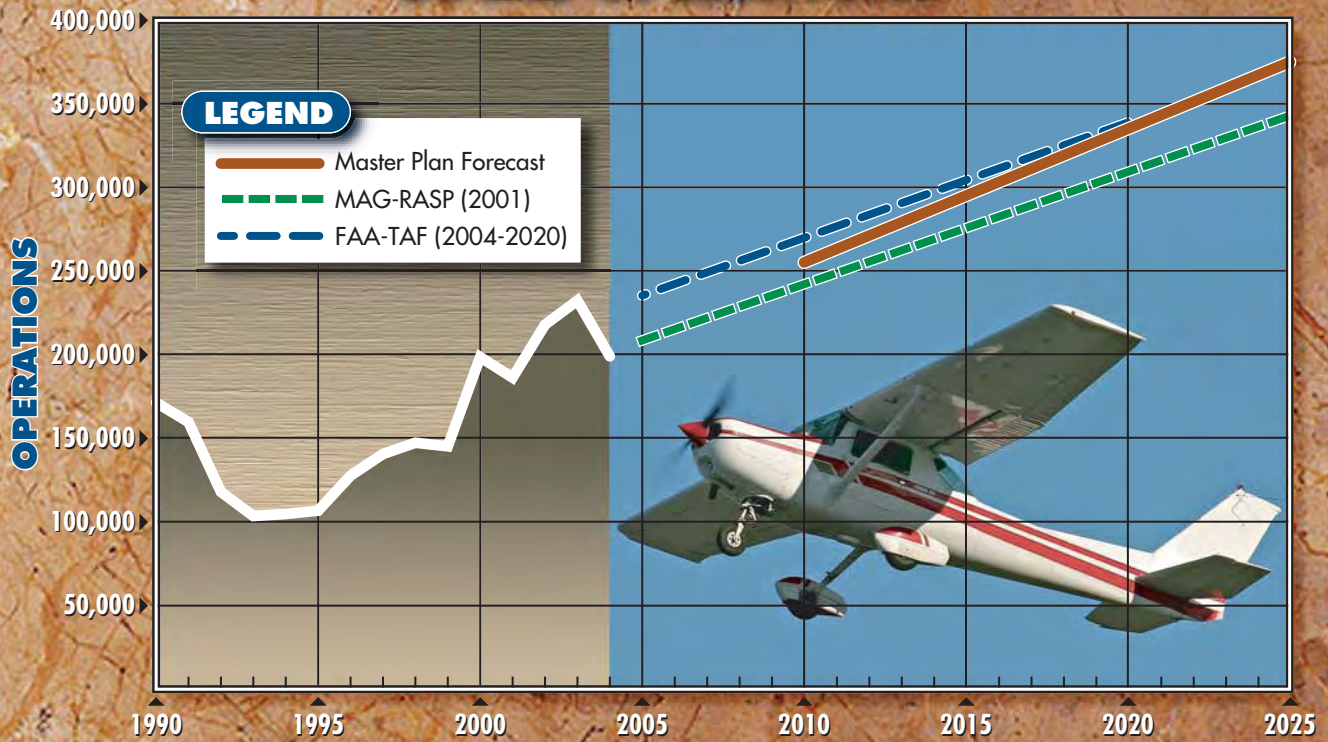


TABLE 2K						
Previous General Aviation Operations Forecast						
Phoenix Deer Valley Airport						
	2000	2005	2010	2015	2020	2025
<i>Itinerant GA Operations</i>						
MAG-RASP (2001)	172,372	181,100		239,500		297,900
FAA-TAF (2004)	159,802	155,246	169,876	184,506	199,137	
<i>Local GA Operations</i>						
MAG-RASP (2001)	198,407	208,300		275,500		342,700
FAA-TAF (2004)	184,131	235,143	269,699	304,255	373,367	
<i>Total GA Operations</i>						
MAG-RASP (2001)	370,779	389,400		515,000		640,600
FAA-TAF (2004)	343,933	390,389	439,575	488,761	572,504	
SANS-2000		300,333	320,855	342,779	366,201	

This table also depicts the itinerant operations per based aircraft ratio. In the 1990s, this ratio has fluctuated from a low of 117 itinerant operations per based aircraft in 1995, to a high of 148 in 1999. Since the turn of the century, the ratio has declined to a low in 2004 of 110. The average for the 15-year period was 128 operations per based aircraft.

Table 2L presents a pair of projections based upon maintaining a “constant” or average market share of the U.S. towered traffic and the average ratio of operations per based aircraft. The constant market share projection would result in a significant decline in operations per based aircraft. Although the operations per based aircraft ratio has fluctuated at DVT over the years, it has maintained an average of 128 operations per based aircraft over at least the past 15 years. Thus, the constant market share projection should be considered a low range forecast.

Maintaining the annual itinerant operations per based aircraft ratio at an average of 128 results in a growing share of the U.S. towered airport operations at DVT. This would total almost 280,000 by 2025. The recent decline in operations per based aircraft at the airport suggests that as the number of aircraft on the airport continues to grow, it will become more difficult to maintain the higher ratios. With high levels of based aircraft, there is more opportunity that many of them will become less active. This will result in a slow decline in operations per based aircraft.

For comparison, the FAA-TAF projections are also presented in the table. The FAA-TAF operations would grow at a rate just marginally faster than the national average, but the operations per based aircraft would gradually decrease. Subsequently, this forecast is slightly higher than the constant market share forecast, but lower than the operations per based aircraft projection.

TABLE 2L General Aviation Itinerant Operations Forecast Phoenix Deer Valley Airport					
Year	DVT GA Itinerant	U.S. ATCT GA Itinerant (millions)	DVT Market Share (%)	DVT Based AC	Itinerant Ops Per AC
1990	103,836	23.1	0.450%	815	127
1991	99,735	22.2	0.449%	778	128
1992	98,693	22.1	0.447%	796	124
1993	99,570	21.1	0.472%	805	124
1994	101,113	21.1	0.479%	803	126
1995	105,144	20.9	0.503%	898	117
1996	119,135	20.8	0.573%	903	132
1997	121,701	21.7	0.561%	908	134
1998	129,248	22.1	0.585%	912	142
1999	135,646	23.0	0.590%	918	148
2000	164,979	22.9	0.720%	1,206	137
2001	147,799	21.4	0.691%	1,046	141
2002	166,777	21.4	0.779%	1,375	121
2003	152,934	20.2	0.757%	1,350	113
2004	139,064	NA	NA	1,252	110
<i>Constant Market Share Projection</i>					
2010	170,247	23.1	0.737%	1,524	112
2015	181,302	24.6	0.737%	1,748	104
2025	205,623	27.9	0.737%	2,185	94
<i>Operations Per Based Aircraft Projection</i>					
2010	195,072	23.1	0.844%	1,524	128
2015	223,744	24.6	0.910%	1,748	128
2025	279,680	27.9	1.002%	2,185	128
<i>FAA-TAF Projections</i>					
2010	169,876	23.1	0.735%	1,115	152
2015	184,506	24.6	0.750%	1,236	149
2025	213,767	27.9	0.766%	1,482	144
<i>Selected Forecast</i>					
2010	180,000	23.1	0.779%	1,524	118
2015	200,000	24.6	0.813%	1,748	114
2025	240,000	27.9	0.860%	2,185	110

For the purposes of the Master Plan, it is recognized that a slowly declining ratio of operations per based aircraft can be expected. While the ratio is likely to recover in the short term with improving economic conditions and fuel prices, over the long term it will decline again. As can be seen on **Table 2L**, the selected forecast represents a median between the high and low ranges also outlined in the table.

The forecast, as presented in the table and on **Exhibit 2D**, would result in 240,000 annual itinerant general aviation operations by 2025.

LOCAL OPERATIONS

Of the seven towered reliever airports in the Phoenix metropolitan area, Phoenix Deer Valley Airport had the

highest level of local operations with 198,759 in 2004. The next closest airport was Chandler Municipal Airport with 168,850. The two flight schools, combined with the larger number of single and twin-engine based aircraft, are the principal reasons for the high local activity at DVT.

Table 2M depicts the history of local operations at Phoenix Deer Valley Airport and examines its historic market share of local operations at towered airports in the United States. Local operations have varied over the past 15 years, depending upon the amount of flight training the schools operating from the airport generated. Local traffic entered the 1990s with a high of 171,079 operations, but declined to 103,122 by 1993. Local operations began to recover in the late 1990s, then jumped dramatically in 2000 with the influx of based aircraft and the increased flight school activity. Local traffic reached its peak in 2003 with 232,155 operations. The 2004 local operations were down 14 percent from the peak the previous year.

Exhibit 2D and **Table 2K** compare the previous forecasts of general aviation local operations. Like its itinerant operations projection, the MAG-RASP expects local operations to grow proportionally with based aircraft. This would result in over 342,000 annual local operations by 2025.

The FAA-TAF again has the advantage of being the more current forecast

and thus has a better consideration for the effects of the post September 11 period. The FAA-TAF projects general aviation local operations to grow at a rate faster than both based aircraft and the national rate. Local operations would reach 339,000 by 2020. Extrapolated to 2025, local operations would be over 373,000.

The FAA *Aerospace Forecasts* project a 1.5 percent per year increase in local operations nationwide. The DVT share of the U.S. market of local general aviation operations at towered airports has averaged 1.37 percent since 2000, when local operations increased significantly due to the flight schools. The market share continued through 2003 with 1.52 percent of local operations. **Table 2M** presents a market share projection that carries the 2003 percentage forward through the planning period.

The second projection on the table considers the local operations per based aircraft since 2000. This ratio has averaged 166, with a low of 158 and a high of 178. **Table 2M** presents a projection based upon maintaining the average ratio throughout the planning period.

For comparison, the FAA-TAF projections are also presented in the table. As indicated earlier, the FAA-TAF local operations are projected to grow at a faster rate than the national average, with local operations per based aircraft increasing slowly as well.

TABLE 2M
General Aviation Local Operations Forecast
Phoenix Deer Valley Airport

Year	DVT GA Local	U.S. ATCT GA Local (millions)	DVT Market Share (%)	DVT Based AC	Local Ops Per AC
1990	171,079	17.1	1.000%	815	210
1991	159,394	16.6	0.980%	778	205
1992	117,619	16.3	0.722%	796	148
1993	103,112	15.5	0.665%	805	128
1994	104,322	15.2	0.686%	803	130
1995	106,313	15.1	0.704%	898	118
1996	127,397	14.5	0.878%	903	141
1997	140,234	15.2	0.923%	908	154
1998	147,008	16.0	0.919%	912	161
1999	144,829	17.0	0.852%	918	158
2000	198,311	17.0	1.167%	1,206	164
2001	185,966	16.2	1.148%	1,046	178
2002	217,730	16.2	1.334%	1,375	158
2003	232,155	15.3	1.517%	1,350	172
2004	198,759	NA	NA	1,252	159
<i>Constant Market Share Projection</i>					
2010	266,912	17.6	1.517%	1,524	175
2015	285,196	18.8	1.517%	1,748	163
2025	324,638	21.4	1.517%	2,185	149
<i>Operations Per Based Aircraft Projection</i>					
2010	252,984	17.6	1.437%	1,524	166
2015	290,168	18.8	1.543%	1,748	166
2025	362,710	21.4	1.695%	2,185	166
<i>FAA-TAF Projections</i>					
2010	269,699	17.6	1.532%	1,115	242
2015	304,255	18.8	1.618%	1,236	246
2025	373,367	21.4	1.745%	1,482	252
<i>Selected Forecast</i>					
2010	255,000	17.6	1.449%	1,524	167
2015	295,000	18.8	1.569%	1,748	169
2025	375,000	21.4	1.752%	2,185	172

The level of local activity will continue to be dependent upon the success of the flight schools, as well as aircraft basing. It is anticipated that the operations per based aircraft will continue to fluctuate around the current ratio. The resulting projection of local operations is presented at the bottom of **Table 2M**, as well as on **Exhibit 2D**. It is similar to both the FAA-TAF and the operations per based aircraft

projections. This forecast projects 375,000 local operations by 2025.

AIR TAXI

The air taxi category includes aircraft involved in on-demand passenger or small parcel transport. The control tower counts air taxi in the same cate-

gory as commuter airlines. At Phoenix Deer Valley Airport, however, there is no scheduled commercial service; thus, the ATCT air taxi count is entirely made up of air taxi activity.

Table 2N presents the history of air taxi operations at DVT since 1990. These operations have fluctuated over the years, with a low of 995 in 1991, followed by a high of 7,343 two years later in 1993. That peak was followed by a decline for three straight years to 3,539 in 1996, then a four year increase to 6,783 in 2000. The past three years have experienced decreases to the 2004 level of 4,079. Air taxi operations have averaged approximately 4,600 annually over the last fifteen years. The FAA-TAF projects air taxi activity to remain level at 3,988 operations annually.

While DVT air taxi activity has not grown over the last several years, many general aviation airports are experiencing increases. The growth in air taxi activity can be primarily attributed to the increased popularity of fractional ownership in aircraft, in particular, turbine aircraft. Fractional ownership allows companies to essentially time-share in an aircraft. A corporation or individual can purchase a fractional share in a type of corporate aircraft. This share will provide the owner a certain amount of flight time each year. This makes flying more feasible for a broader number of firms or individuals.

Year	Air Taxi	Annual % Growth
1990	1,935	NA
1991	995	-48.6%
1992	3,545	+256.3%
1993	7,343	107.1%
1994	5,905	-19.6%
1995	3,675	-37.8%
1996	3,539	-3.7%
1997	4,598	+29.9%
1998	4,783	+4.0%
1999	6,338	+33.6%
2000	6,783	+6.2%
2001	5,869	-13.5%
2002	4,990	-15.0%
2003	4,153	-16.8%
2004	4,079	-1.6%

Source: FAA - ATADS

Many operations by fractional aircraft are counted as air taxi operations, as are many charter aircraft. As security measures placed on commercial flights increased, interest in fractional and corporate aircraft ownership, as well as on-demand charter flights also increased.

Overall, the seven towered reliever airports in the Phoenix metropolitan area have experienced a 29 percent increase in air taxi activity from pre-September 11 levels. DVT, Glendale Municipal, and Chandler Municipal Airports have not experienced any significant increase in air taxi activity. Phoenix Goodyear, Scottsdale, and Williams Gateway Airports, as well as Falcon Field in Mesa have each experienced increases of 35 percent or more.

The fluctuation in air taxi activity at DVT over the years does not produce a statistical trend line that can be relied upon to predict future activity levels. A low range forecast would be in line with the FAA-TAF air taxi forecast of level activity through the planning period.

Another scenario considers air taxi operations growing at a rate similar to general aviation itinerant operations. Air taxi operations at DVT have generally been equivalent to three to five percent of the itinerant general aviation operations at the airport each year. In the past four years, the ratio has been in the three percent range. For the seven reliever airports combined, however, air taxi operations have grown from 4.8 percent of itinerant GA operations in 2000, to 6.4 percent in 2004.

Because of the high levels of general aviation activity it supports, DVT air taxi activity is likely to remain a smaller percentage than that of the combined airports. A slow increase in that percentage may be experienced as economic activity in the North Valley continues to grow and more business aircraft utilize the airport.

Since a large amount of air taxi traffic is flown by business jets, the growth in business jet activity will affect air taxi growth. The FAA forecasts the number of business jets in the general aviation fleet to increase by an annual average of 5.1 percent. The typical corporate-owned jet is utilized 300 hours per year, while the fractional jet is used nearly three times as much. As a result, the FAA projects that total business jet hours flown will in-

crease from 2.75 million hours in 2003, to 5.9 million hours in 2015, for an annual average increase of 6.5 percent.

For planning purposes, the DVT air taxi operations were projected to grow at the 6.5 percent rate through the intermediate term (2015). Beyond the intermediate term, the average annual growth rate would gradually reduce to the 4.3 percent. **Table 2P** presents this growth scenario that would result in 12,400 air taxi operations by 2025. This projection was selected as the preferred forecast for air taxi operations.

	2010	2015	2025
FAA/TAF 2004	4,543	4,543	4,543
Master Plan Forecast	6,400	8,400	12,400

MILITARY

Military activity accounts for the smallest portion of the operational traffic at DVT. **Table 2Q** presents the history of military operations since 1990. Over that 15-year period, military operations have averaged 584 annually, with a high of 1,129 operations in 1993, and a low of 49 operations in 2004. In fact, for each of the last three years, military operations have been below 100. While military traffic has been down in recent years, there is still potential for traffic to return to previous levels. With the high level of civilian traffic at the airport, however, growth beyond the previous

levels is not anticipated. For planning purposes, military operations are pro-

jected to fluctuate around 600 annually throughout the planning period.

TABLE 2Q Military Operations Phoenix Deer Valley Airport			
Year	Annual Operations		
	Itinerant	Local	Total
1990	631	342	973
1991	554	391	945
1992	759	236	995
1993	1,034	95	1,129
1994	680	81	761
1995	563	33	596
1996	515	237	752
1997	237	62	299
1998	208	151	359
1999	478	165	643
2000	610	76	686
2001	343	93	436
2002	55	18	73
2003	55	12	67
2004	44	5	49
<i>FORECAST</i>			
2010	450	150	600
2015	450	150	600
2025	450	150	600

ATCT COUNT ADJUSTMENT

Since the Phoenix Deer Valley Airport traffic control tower (ATCT) is not a 24-hour tower, its air traffic counts are not all-inclusive of aircraft operations at the airport. Some aspects of the master plan analysis require that all airport activity be considered. For these evaluations, it is necessary to estimate and adjust for operations that occur when the tower is closed. The DVT tower currently operates from 6:00 a.m. to 9:00 p.m.

To provide a reasonable estimate of overnight operations, an overnight count was performed each night for a week, from the evening of December 12 through the morning of December 19, 2004.

The traffic count included arrivals, departures, a separate listing of touch and go's, as well as aircraft that are transitioning across the airport's airspace. **Table 2R** provides a summary of the overnight survey. There were a

total of 245 operations recorded during the week-long survey. In addition,

there were 14 contacts made by aircraft transitioning over the airport.

TABLE 2R Phoenix Deer Valley Overnight Traffic Count December 12-19, 2004						
By Aircraft Mix	SE	ME	TP	J	R	Total
Arrivals	22	12	7	4	41	86
Departures	20	8	8	2	41	79
Touch & Go	44	0	0	0	36	80
Total Operations	86	20	15	6	118	245
Transitions	1	0	0	0	13	14
Total	87	20	15	6	131	259
By Hour	Arrivals	Departures	T&G	Total Ops	Transitions	Total
2100-2159	24	14	16	54	2	56
2200-2259	24	21	12	57	2	59
2300-2359	10	9	0	19	2	21
0000-0059	9	11	0	20	4	24
0100-0159	6	12	0	18	1	19
0200-0259	5	1	8	14	1	15
0300-0359	4	2	0	6	1	7
0400-0459	2	2	0	4	0	4
0500-0559	2	7	44	53	1	54
Totals	86	79	80	245	14	259
By Day of Week	Survey	ATCT Count	Total Operations	Overnight Percent		
Sunday	45	913	958	4.70%		
Monday	30	970	1,000	3.00%		
Tuesday	68	1,140	1,208	5.63%		
Wednesday	36	1,325	1,361	2.65%		
Thursday	25	875	900	2.78%		
Friday	25	1,051	1,076	2.32%		
Saturday	16	1,012	1,028	1.56%		
Week Totals	245	7,286	7,531	3.25%		
Note: ATCT Sunday Count is average of December 12 and 19.						

Helicopters accounted for nearly half (118) the operations. Nearly one-third (80) of the operations were touch-and-go's. The busiest hours were the two hours just after the ATCT closes for the night, and the hour just before the ATCT opens in the morning. Fifty-two (52) percent of the overnight operations were recorded before midnight.

The table also compares the daily total with the tower open and closed. According to the survey, overnight operations comprise approximately 3.25 percent of the total daily operations at Phoenix Deer Valley Airport. While touch-and-go traffic was distinguished, other local operations could not be. Thus, it is assumed that the percent-

age adjustment is similar for both types of operations. Air taxi operations were distinguished by utilizing FAA flight plan records. It was found that the percentage of overnight air taxi operations was essentially the same as that for total operations. There was no military activity recorded by the survey or by the ATCT during the entire month of December. Because this activity is very small throughout the year, no adjustment was made to military operations. The adjusted operations are included in **Exhibit 2E**.

SUMMARY

Exhibit 2E provides a summary of the aviation activity forecasts for Phoenix Deer Valley Airport. These forecasts will be utilized in establishing planning horizon milestones that will then be used to determine future facility needs and potential solutions.

Based aircraft at DVT are projected to grow from 1,252 in the last year, to 2,185 over the long term by 2025. This represents a 3.3 percent annual average growth over the short term, and 2.4 percent annually beyond the short term. This strong growth is reflective of the growth expected for population and employment in the

primary service area for DVT. Population is forecast to grow at 2.5 percent annually, while employment is forecast to grow at over 3.0 percent per year.

Business jets are anticipated to show the strongest rate of growth into the future, reflective of what is happening in the industry. Based jets are expected to quadruple from 26 to 104 over the long term, growing from 2.1 percent to 4.8 percent of the DVT based aircraft fleet.

Annual operations are forecast to grow from 340,894 in 2004, to 628,000 by 2025. Military operations will remain a minor part of activity at the DVT, but air taxi operations are expected to more than triple, particularly with growth in fractional ownership of aircraft.

Flight training is expected to be prominent at DVT into the future. Local operations totaled 58 percent of all operations in 2004, and are expected to maintain a similar share throughout the planning period. This will be due primarily to the airfield and airspace capabilities at DVT. The next chapter will examine the operational capabilities of the airfield in relation to both existing and projected aviation activity.

2004 2010 2015 2025

BASED AIRCRAFT				
Single-engine Piston	1,086	1,318	1,501	1,855
Multi-engine Piston	111	123	132	144
Turboprop	13	20	28	46
Business Jet	26	42	61	104
Helicopter	8	11	14	20
Other	8	10	12	16
Total Based Aircraft	1,252	1,524	1,748	2,185

ATCT OPERATIONS COUNT				
General Aviation				
Local	198,759	255,000	295,000	375,000
Itinerant	137,550	180,000	200,000	240,000
<i>Total General Aviation</i>	<i>336,309</i>	<i>435,000</i>	<i>495,000</i>	<i>615,000</i>
Air Taxi	4,079	6,400	8,400	12,400
Military	49	600	600	600
Total ATCT Operations	340,437	442,000	504,000	628,000

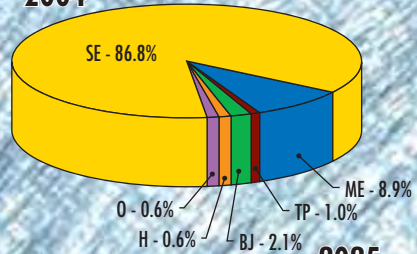
ADJUSTED OPERATIONS				
General Aviation				
Local	205,219	263,300	304,600	387,200
Itinerant	142,020	185,800	206,500	247,800
<i>Total General Aviation</i>	<i>347,239</i>	<i>449,100</i>	<i>511,100</i>	<i>635,000</i>
Air Taxi	4,212	6,600	8,700	12,800
Military	49	600	600	600
Total Adjusted Operations	351,500	456,300	520,400	648,400

Adjustment accounts for the hours (9 p.m. - 6 a.m.) when the ATCT is closed.

BASED AIRCRAFT

ATCT OPERATIONS

2004



2025

