Chapter Two
AVIATION FORECASTS

CHAPTER TWO

Aviation Forecasts

The purpose of this chapter is to examine the existing and potential demand for aviation activity at Georgetown Municipal Airport (GTU). This should begin with a definition of the demand that may occur over a specified period. The projected demand levels can then be analyzed to determine future noise exposure and impacts in the vicinity of Georgetown Municipal Airport.

Air transportation is a unique industry that has experienced wide fluctuations in growth and decline. For this reason, it is important for airports to evaluate their current position and examine future demand potential on a regular basis. This holds especially true today given limited public funding mechanisms and increased needs of the aviation community.

The primary objective of this planning effort is to define the magnitude of change that can be expected over time. Because of the cyclical nature of the economy, it is virtually impossible to predict with certainty year-to-year fluctuations in activity when looking as far as ten years into the future. However, a trend can be established which delineates long-term growth potential. While a single line is often used to express the anticipated growth, actual growth may fluctuate above and below this line. It is important to understand that forecasts serve primarily as guidelines, as aviation activity is affected by many external influences, especially by the types of aircraft used and the nature of available facilities.

Although publicly-owned and operated, airports operate in a similar manner to the private business environment. Airports provide much needed services to the community and have to recognize their position and establish well-planned goals in order to better serve the community. Marketing efforts and facility development are matched to goals so that the airport can best serve the community.

In order to fully assess current and future aviation demand for Georgetown Municipal Airport, an examination of several key factors is needed. Forecasting should consider national and regional aviation trends, historical and forecast socioeconomic and demographic information of the area and competing transportation modes and facilities. Consideration and analysis of these factors will ensure a comprehensive outlook for future aviation demand at the Georgetown Municipal Airport.

The total impacts the events of September 11, 2001 will have on general aviation can only be determined over time. General aviation recovery will be dependent upon economic recovery, fuel prices, and the type and extent of any new regulatory controls over flight training and operations.

LOCAL SOCIOECONOMIC FEATURES

The local socioeconomic conditions provide an important baseline consideration for preparing aviation demand forecasts. In most cases local socioeconomic variables such as population, employment and income can provide an important indicator for understanding the dynamics of the community and in particular the trends in aviation growth.

For this study, socioeconomic variables for the state of Texas, the Austin-San Marcos metropolitan statistical area (MSA), Williamson and Travis counties, and the city of Georgetown have been considered. The Austin-San Marcos MSA consists of Bastrop, Caldwell, Hays, Travis, and Williamson Counties. Information specific to individual cities was obtained from the Texas Water Development Board and the City of Georgetown, while County and MSA information was gathered from Woods and Poole Complete Economic and Demographic Data Source (CEDDS) 2001 and the U.S. Census Bureau.

POPULATION

Table 2A summarizes historical and forecast population estimates for Texas, the Austin-San Marcos MSA, Williamson and Travis County, and area cities. Each area has experienced population growth over the past decade. Georgetown has experienced the largest percentage growth, increasing by 6.7 percent annually between 1990 and 2000. Over this period, the City of Georgetown has experienced an increase of 13,497 residents, growing from 14,842 in 1990 to 28,339 in 2000.

The city of Austin has also experienced significant population growth. The growth can be primarily attributed to the infusion of jobs in the high technology industry. Austin has grown at an average annual rate slightly above three percent between 1990 and

2000, increasing by 190,940 residents. Population for Travis County has increased at a slightly slower rate of 2.46 percent annually while Williamson County, where Georgetown is located, has experienced an annual population increase of 6.18 percent over the same time period.

TABLE 2A
Socioeconomic Data
Georgetown Municipal Airport

	Historical (1)		*Forecast* (2)
	1990	**2000**	**2006**
Austin-San Marcos MSA			
Population	850,600	1,249,763	1,371,350
Employment	516,720	827,210	979,080
PCPI	$18,093	$31,277	$39,034
Williamson County			
Population	140,610	249,967	344,422
Employment	46,820	99,660	126,670
PCPI	$16,214	$27,392	$33,009
Travis County			
Population	579,740	812,280	816,171
Employment	423,000	650,530	761,200
PCPI	$19,593	$34,966	$44,596
City Populations			
Georgetown	14,842	28,339	45,817
Austin	465,622	656,562	729,656
San Marcos	28,738	34,733	46,204

Sources: (1) Historic City and MSA Populations from U.S. Census Bureau
(2) Forecasts from Texas Water Development Board, 2002 State Water Plan, County and MSA employment + PCPI from Woods and Poole CEDDS 2001, and U.S. Census Bureau. All forecasts for 2006 were interpolated by Coffman Associates, Inc.

Population projections show continued growth over the planning period. The Austin-San Marcos MSA is projected to reach 1,371,350 residents by 2006, while Williamson County is expected to reach 344,422 residents. Population for the City of Georgetown is expected to reach 45,817 by 2006. The City of Austin is projected to reach 729,656 residents by 2006.

EMPLOYMENT

Historical and forecast employment data for Texas, the Austin-San Marcos MSA, and Williamson and Travis Counties is also presented in **Table 2A**. Total employment for the MSA and both counties has increased at a greater average annual rate than population between 1990 and 2000. Over the period, employment in the MSA has increased by 4.82 percent annually compared to the 3.31 percentage increase in population. Williamson County employment increased at an average annual rate of 7.85 percent in comparison to a population growth of 6.18 percent.

PER CAPITA PERSONAL INCOME (PCPI)

Table 2A also compares per capita personal income (adjusted to 2001 dollars) for the MSA and Williamson and Travis Counties. The Austin-San Marcos MSA had an adjusted PCPI of $31,277 in 2000. Williamson County PCPI was slightly lower at $27,392.

The Austin-San Marcos MSA maintains a higher adjusted PCPI than Williamson County and a higher average annual growth since 1990. Williamson County PCPI increased at 5.38 percent annually while the MSA PCPI maintained a growth rate of 5.63 percent over the previous ten years. Through the year 2001, the Williamson County PCPI is expected to reach $40,181 while the MSA is projected to reach $49,306.

FORECASTING APPROACH

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

The most reliable approach to estimating aviation demand is through the utilization of more than one analytical technique. Methodologies frequently considered include trend line projections, correlation/regression analysis, and market share analysis.

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

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

In regression analysis, values for the aviation demand in question (i.e. based aircraft), the dependent variable, are projected on the basis of one or more other indicators, the independent variable(s). Historical values for all variables are analyzed to determine the relationship between the independent and dependent variables. These relationships may then be used, with projected values of the independent variable, to project corresponding values of the dependent variable.

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

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

A wide range of factors are known to influence the aviation industry and can have significant impacts on the extent and nature of air service provided in both the local and national market. Technological advances in aviation have historically altered, and will continue to change, the growth rates in aviation demand over time. The most obvious example is the impact of jet aircraft on the aviation industry, which resulted in a growth rate that far exceeded expectations. Such changes are difficult, if not impossible to predict, and there is simply no mathematical way to estimate their impacts. Using a broad spectrum of local, regional and national socioeconomic and aviation information, and analyzing the most current aviation trends, forecasts are presented in the following sections.

It is important to realize that future growth based on historical activity is generally projected based on the assumption that the airport has unlimited growth potential. In Georgetown, this may not be the case as future growth will likely be somewhat constrained. The primary limiting factor in the near term is the lack of available facilities, such as T-Hangars. With the recent influx of based aircraft, the airport will be playing "catch-up" for some time in getting funding for, and building new facilities.

Longer term, the airport is unlikely to be in a position to lengthen the runway. The current length of 5,000 feet prohibits some aircraft, especially medium to large business jets from operating at GTU year round. While most general aviation aircraft are able to operate in cooler months at GTU, the extreme heat in the summer months significantly limits or even prohibits many of the larger business jets from operating at the airport. This runway limitation will ultimately suppress the numbers of medium to large sized business jets that will be based at Georgetown Municipal Airport. Business jet operators utilize their aircraft primarily for cost savings. Much of the cost saving is due to the cost of time, which would be lost at GTU if they would be required to make an additional stop en-route for fuel.

For these reasons, the following forecast analysis will consider a constrained scenario. The sections below will provide analysis of the aviation demand categories for Georgetown Municipal Airport over the next five years. Each segment will be examined individually and then collectively to provide an understanding of the overall aviation activity at Georgetown Municipal Airport through 2006.

NATIONAL AVIATION TRENDS

The Federal Aviation Administration (FAA) publishes a national aviation forecast on an annual basis. These forecasts include projections for major air carriers, regional/commuters, general aviation, and FAA workload measures. They 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 by the general public. The current edition when this chapter was prepared was **FAA Aerospace Forecasts - Fiscal Years 2001-2012**. The forecast uses 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.

According to the FAA, the U.S. aviation industry outlook for the next 12 years is for sustained, moderate economic growth, even though growth is expected to be somewhat slower in the short term (2002-2004). In addition, real fuel prices over this period are expected to decline slightly, even though prices rose in 2000.

GENERAL AVIATION TRENDS

General aviation is defined as the portion of civil aviation that encompasses all facets of aviation except commercial and military operations. The United States general aviation fleet is projected to total 245,965 in 2012, an increase of almost 25,000 aircraft over the 12-year forecast period (0.9 percent annual growth). The forecast assumes that the business use of general aviation aircraft will expand at a more rapid pace than personal use. The more expensive and sophisticated turbine-powered part of the fixed-wing fleet is expected to grow at four times the rate of that forecast for the piston aircraft categories (2.7 percent to 0.6 percent annually). The fleet forecasts have been summarized in **Exhibit 2A**.

The number of active pilots are forecast to increase by 2.0 percent annually through 2012. Most of this growth is anticipated in the student and airline transport categories. General aviation hours flown are projected to increase an annual average of 2.2 percent through 2012. This larger increase in hours relative to the increase in aircraft indicates that a higher utilization of the general aviation fleet is expected.

The general aviation industry is particularly vulnerable to an economic slowdown or recession. The recent turnaround in the demand for general aviation products and services has occurred during a period of unprecedented economic growth. It is not known how the industry or its customers will react to a protracted slowing of demand or an economic recession.

Manufacturer and industry programs and initiatives continue to revitalize the general aviation industry. Notable initiatives include the "No Plane, No Gain" campaign sponsored by GAMA and the National Business Aviation Association (NBAA), "Project Pilot" sponsored by the Aircraft Owners and Pilots Association (AOPA), the "Learn to Fly" campaign sponsored by the National Air Transportation Association (NATA), and "GA Team 2000", which was sponsored by more than 100 industry organizations and set the goal of 100,000 annual student pilot starts by the year 2000. The "No Plane, No Gain" campaign is a program promoting the cost effectiveness of using general

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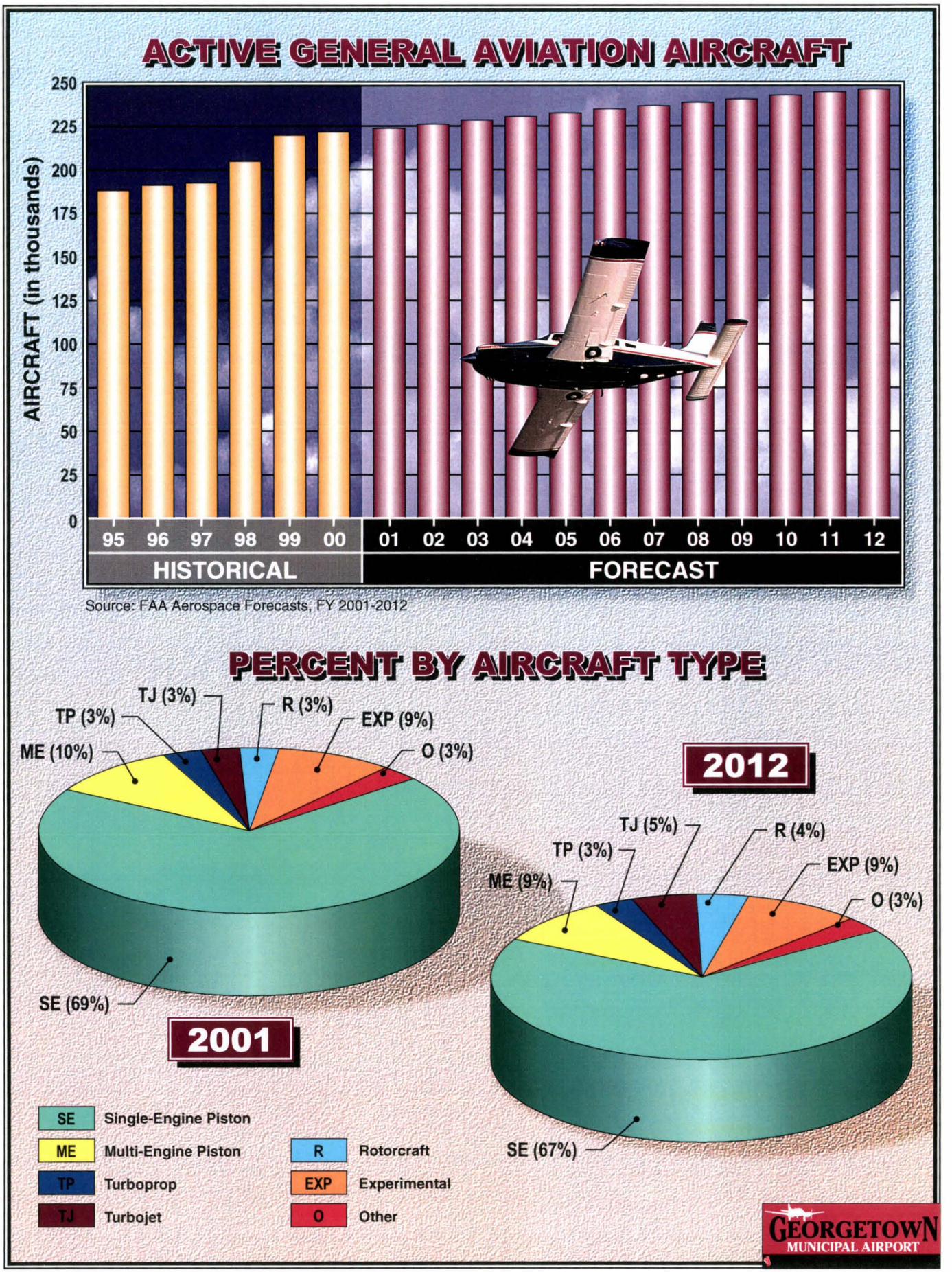


Exhibit 2A
U.S. ACTIVE GENERAL AVIATION
AIRCRAFT FORECASTS

aviation aircraft for business and corporate uses. "Project Pilot" and "Learn to Fly" are programs promoting training of new pilots.

The general aviation industry is also launching new programs to make aircraft ownership easier and more affordable. The New Piper Aircraft Company has created Piper Financial Services (PFS) to offer competitive interest rates and/or leasing of Piper aircraft. The Experimental Aircraft Association offers financing for kit built airplanes through a private lending institution.

The most striking industry trend is the continued growth in fractional ownership programs. Fractional ownership programs allow businesses and individuals to purchase an interest in an aircraft and pay for only the time that they use the aircraft. This has allowed many businesses and individuals, who might not otherwise, to own and use general aviation aircraft for business and corporate uses. The five major companies in this industry are Executive Jets' Netjets, Bombardier's Flexjet, Raytheon's Travel Air, Flight Options and TAB aviation. Cessna has recently launched its own fractional ownership program as well. Between 1993 and 1998, these companies expanded their fleets and shareholders by 65.2 percent and 66.1 percent, respectively. In 1999, the fractional jet fleet totaled 329 and shareholders totaled 1,567. Since 1993, Executive Jet has ordered 368 new aircraft and is purportedly the single largest nonmilitary purchaser of aircraft.

While the fractional jet ownership industry is rapidly expanding, new attention has been given to the regulatory oversight of the industry. Currently, fractional jet providers operate under Federal Aviation Regulation (FAR) Part 91 which governs general aviation aircraft. The FAA, however, is considering policy changes to make fractional ownership providers operate under FAR Part 135 which governs commercial operations for air carriers, air taxi and air charter companies. Part 135 operators believe the fractional ownership providers benefit from the less restrictive FAR Part 91 standards. The FAA commissioned a formal rulemaking committee to analyze regulatory requirements for the industry. Their report, released in Spring 2000, recommended that fractional ownership providers operate under a new subpart of FAR 91. The FAA is now reviewing this proposal. A formal rulemaking proposal could be made within a year.

The fractional ownership providers are concerned about a move to regulate them as FAR Part 135 operators. FAR Part 135 standards would restrict the number and type of airports that could be operated at by requiring longer runways and airports with approved weather reporting.

AIRPORT SERVICE AREA

The initial step in determining the general aviation demand for an airport is to define its generalized service area for the various segments of aviation the

airport can accommodate. The airport service area is determined primarily by evaluating the location of competing airports, their capabilities and services, and their relative attraction and convenience.

The airport service area is an area where there is a potential market for airport services. Access to general aviation airports, commercial air service, and transportation networks enter into the equation that determines the size of a service area, as well the quality of aviation facilities, distance, and other subjective criteria. It should be recognized that aviation demand does not necessarily conform to political or geographical boundaries.

As in any business enterprise, the more attractive the facility is in services and capabilities, the more competitive it will be in the market. As the level of attractiveness expands, so will the service area. If facilities are adequate and rates and fees are competitive at Georgetown Municipal Airport, some level of general aviation activity might be attracted to the airport from surrounding areas.

The determination of future based aviation demand for Georgetown Municipal Airport begins with a review of the local based aircraft service area. The local airport service area is defined by the proximity of other airports and the facilities and services that they currently provide to general aviation aircraft.

Georgetown Municipal Airport is designated as a reliever airport by the FAA in the National Plan of Integrated Airport Systems (NPIAS). The designation indicates that the airport serves to provide general aviation services near a large metropolitan area so that the general aviation activity will be minimized at the larger commercial service airport. (Austin Bergstrom)

Defining the service area, or aviation demand pool for Georgetown can be a challenging task. The recent closure of Austin Mueller and shift of aviation activity to Austin Bergstrom as well as the closure of Austin's only general aviation airport, Austin Executive, has directly impacted GTU. In the last two years, based aircraft at GTU have increased by 135 aircraft, more than doubling. Although immediate impacts caused by the closures are over, it is likely that Georgetown will continue to attract aircraft from owners living in the Austin metropolitan area.

Realizing the need for a "close-in" reliever, state legislators have considered Bills which would direct the Texas Department of Transportation (TxDOT) to construct a new airport in the Austin metropolitan area. Initially, the Bill would have located the new general aviation airport in downtown Austin. Others proposed re-using a portion of the closed Mueller Airport. Other locations discussed for the new airport included Pflugerville and Manor. The development of a new airport at Pflugerville, however, has since been deemed as not feasible. The current form of the legislation requires that TxDOT support the construction of a general aviation airport in the Central Texas region which would not include Mueller. If a new airport is constructed in or north of Austin, it could have a direct impact on GTU beyond the 10-year forecast period.

The only other reliever airport in the Austin area is the San Marcos Municipal Airport, located on the south side of the Austin metropolitan area. San Marcos is situated to accommodate aircraft owners in the mid to southern portions of Austin who elect not to base their aircraft at Bergstrom due to high activity levels by large aircraft. San Marcos is located far enough south of GTU that is does not have an immediate impact on GTU, although it does pull from the same pool of Austin based aircraft.

The primary service area is also defined by smaller surrounding communities. Georgetown's primary competition in this category is the airports at Kittie Hill, Taylor Municipal, and Rusty Allen/Lago Vista Airports. Kittie Hill has three turf runways, the longest being 3,450 feet. There are over 75 based aircraft at Kittie Hill. Taylor Municipal Airport is currently extending its asphalt runway to 4,000 feet. This airport has 31 based aircraft and provides many of the services required by general aviation pilots. Rusty Allen is served by a 3,800 foot asphalt runway and has over 60 based aircraft. These airports, and others do provide the services and facilities necessary to compete in attracting small general aviation aircraft.

Another factor impacting the service area is the decision to shift commercial service from Killeen to the Gray Army Airfield. This decision will increase the availability of facilities at Killeen for use by general aviation aircraft, which could have an impact on Georgetown. By shifting commercial service from Killeen, it will become a more attractive location for general aviation pilots located north of Georgetown. Located outside the primary service to the north of Georgetown is the airport at Temple where a 6,300 foot runway and other facilities can also be a draw for pilots.

Considering all of these factors the primary general aviation service area for the Georgetown Municipal Airport can be generally described as the City of Georgetown extending south into Austin. (Williamson and Travis Counties) The secondary service area can be expected to extend east, west, and north approximately 30 miles.

AVIATION FORECASTS

To determine the current and future noise impacts at GTU, certain elements of general aviation activity must be quantified and forecast. These indicators of general aviation demand include:

- Based Aircraft
- Based Aircraft Fleet Mix
- Local and Itinerant Operations
- Fleet Mix Operations

BASED AIRCRAFT FORECASTS

The number of based aircraft is the most basic indicator of general aviation demand. By first developing a forecast of based aircraft, the growth of the other indicators can be projected based upon this growth and other factors characteristic to Georgetown Municipal Airport and the area it serves.

One method of forecasting based aircraft at an airport is to examine local aircraft ownership, or aircraft

registrations in the airport's service area. As previously indicated, the primary service area for aircraft basing at GTU is and will continue to be Williamson and Travis counties. For this reason, an examination of registered aircraft in the combined two county area has been completed.

Registered Aircraft Forecasts

Historical records of aircraft ownership in Williamson and Travis counties were obtained and evaluated in preparing the forecast of registered aircraft. Historically Georgetown Municipal Airport has drawn primarily from the Williamson County registered aircraft as its service area. In recent years however, with the closure of airports in the Austin area, Georgetown's market area has expanded to encompass more of the surrounding area including Travis county. Due to the expansion of Georgetown's service area, the registered aircraft for these two counties were both examined in determining the registered aircraft forecast.

The first registered aircraft forecast was developed by comparing the combined total of aircraft registered in Williamson and Travis counties with the United States active fleet of general aviation aircraft. This forecast is shown on **Table 2B**, along with historical Williamson and Travis County aircraft registrations since 1986.

The next forecast method used was a trend line, or time series forecast based on historical data showing the combined registrations in Williamson and Travis counties from 1990 to 2000.

A second time series based on the combined populations of Williamson and Travis counties was run on data from 1986 to 2000. The time series run on combined registrations showed a 0.98 coefficient and the combined population coefficient showed a 0.76 coefficient. The time series forecasts are depicted on **Exhibit 2B**.

Another forecast examined was the rate of aircraft registrations per 1,000 residents of the combined counties of Williamson and Travis. The two county aircraft registrations have followed a relatively constant growth as compared with the two county population. Thus, a constant share forecast has been developed. The results of these forecasts can be seen in **Table 2C**.

By evaluating all of these forecasts, and local and regional market conditions a selected forecast was chosen. A summary of these forecasts, and the selected forecast, is shown on **Exhibit 2B**. This middle range projection is more in line with historic local trends while taking into account industry projections for general aviation. For forecasting purposes, two-county registered aircraft of 1,230 for 2006 will be used for the reminder of the plan.

Based Aircraft Projections

The first method for forecasting based aircraft for Georgetown Municipal Airport included a trend line projection. Considering based aircraft at the airport between 1990 and 2000, the time series provided an "r" value of 0.87. As previously mentioned that an "r" value of greater than 0.9 indicates a strong correlation. The time series projection yields 299 aircraft for 2006.

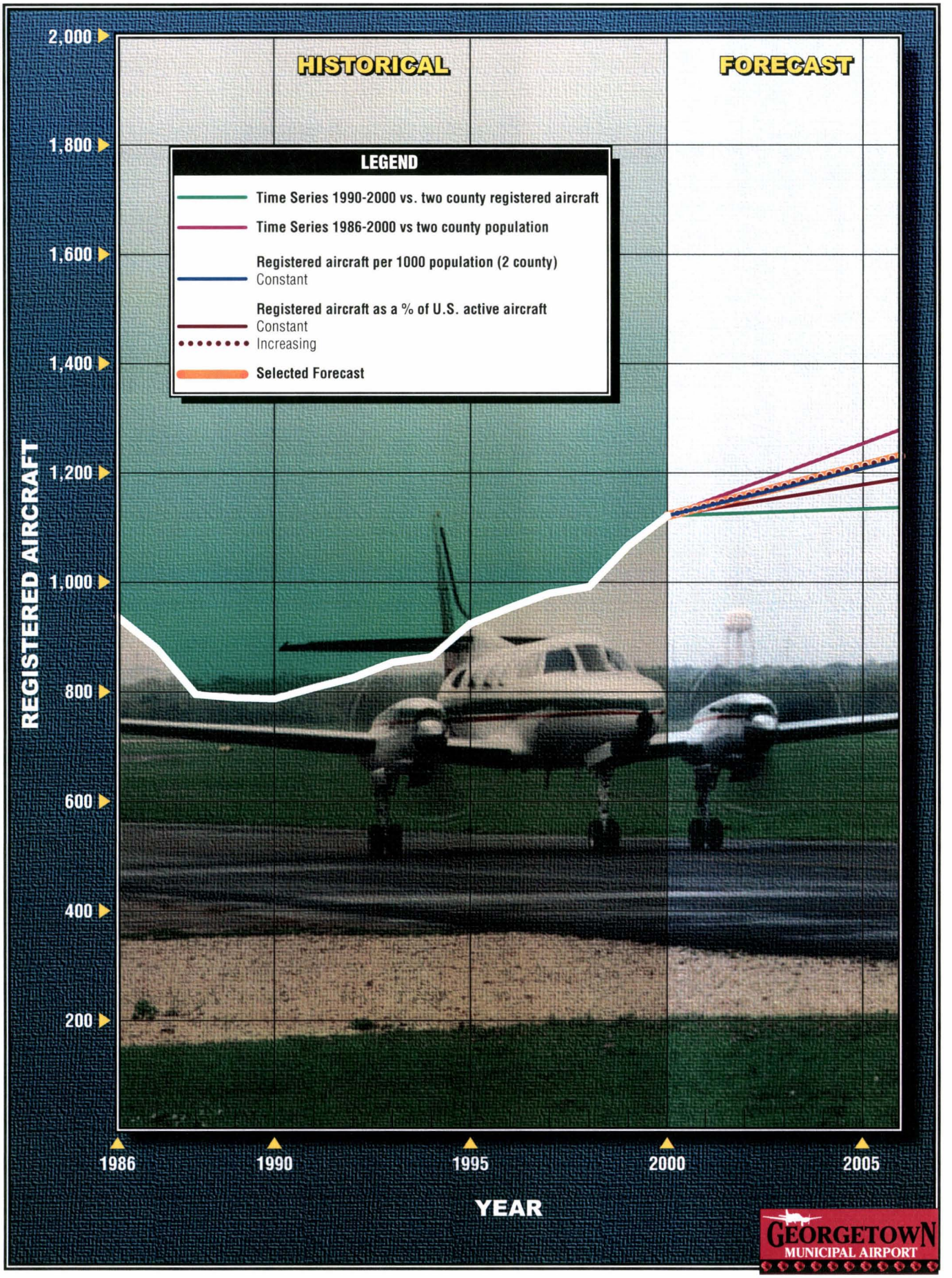


Exhibit 2B
REGISTERED AIRCRAFT FORECASTS

TABLE 2B
Registered Aircraft Forecasts
Georgetown Municipal Airport

Year	Williamson	Travis	Combined	U.S. Active	% of U.S.
1986	191	746	937	210,700	0.445%
1987	186	693	879	220,000	0.400%
1988	172	623	795	217,100	0.366%
1989	168	621	789	210,300	0.375%
1990	168	619	787	219,700	0.358%
1991	154	653	807	198,000	0.408%
1992	161	664	825	198,700	0.415%
1993	178	675	853	177,119	0.482%
1994	186	677	863	172,936	0.499%
1995	202	722	924	188,089	0.491%
1996	223	730	953	191,129	0.499%
1997	234	745	979	192,414	0.509%
1998	252	739	991	204,710	0.484%
1999	297	769	1,066	219,464	0.486%
2000	310	811	1,121	221,213	0.507%
CONSTANT SHARE FORECAST					
2006	–	–	1,189	234,455	0.507%
INCREASING SHARE FORECAST					
2006	–	--	1,230	234,455	0.525%

Source: Historical FAA Data, U.S. Census of Civil Aircraft; Year of forecasts from FAA Aerospace Forecasts - Fiscal Years, 2001-2012 Publication.

TABLE 2C
Registered Aircraft per 1,000 Population
Georgetown Airport

Year	Williamson/Travis Registered A/C	Williamson/Travis Population	Aircraft per 1,000 Population
1990	787	720,348	1.09
1991	807	742,258	1.09
1992	825	766,144	1.08
1993	853	793,129	1.08
1994	863	820,006	1.05
1996	953	877,282	1.09
1997	979	902,254	1.09
1998	991	932,874	1.06
1999	1,066	967,918	1.10
2000	1,121	1,062,247	1.05
Constant Share Forecast			
2006	1,224	1,160,593	1.05

Source: Aircraft registrations from FAA Data U.S. Census of Civil Aircraft; All Historical Population from U.S. Bureau; Forecasts from Texas Water Development Board, 2002 State Water Plan, County and MSA employment + PCPI from Woods and Poole CEDDS 2001, and U.S. Census Bureau. Forecasts for 2006 were interpolated by Coffman Associates, Inc.

Based aircraft at Georgetown can also be examined in light of registered aircraft in the two county area. **Table 2D** presents historical market share analysis providing GTU's share of the two county registered aircraft since 1986.

TABLE 2D Georgetown Municipal Airport Based Aircraft vs. Two County Registered Aircraft			
Year	**Georgetown-Based[1]**	**Two-County Registered[2]**	**% Share**
1986	100	937	10.67%
1987	156	879	17.75%
1988	156	795	19.62%
1989	105	789	13.31%
1990	95	787	12.07%
1991	90	807	11.15%
1992	91	825	11.03%
1993	91	853	10.67%
1994	112	863	12.98%
1996	133	953	13.96%
1997	133	979	13.59%
1998	133	991	13.42%
1999	201	1,066	18.86%
2000	268	1,121	23.91%
DECREASING SHARE PROJECTION[3]			
2006	283	1,230	23.00%
CONSTANT SHARE PROJECTION			
2006	295	1,230	24.00%
INCREASING SHARE PROJECTION			
2006	320	1,230	26.00%

Sources: [1] From Airport records and FAA 5010 forms. [2] FAA's U.S. Census of civil aircraft. [3] Coffman Associates forecasts.

As presented in the table, GTU's market share of the Travis/Williamson combined two county registered aircraft has increased significantly, especially since 1998. The airport's share of the two county registered aircraft remained relatively constant until the closure of Austin Executive and Mueller airports. The market share then spiked to approximately 24 percent.

Given the historic trends of based aircraft and the constrained nature of the airport, three market share forecasts of two county registered aircraft were developed.

First, a decreasing share which considers the potential for the construction of another northern reliever airport or lack of facility development at GTU yields 283 aircraft by 2006. Next, a constant share forecast considering GTU based aircraft will grow at the same pace as the two county registered aircraft produces 295 based aircraft by 2006. Finally, an increasing share forecast considering continued lack of another area airport, strong local and regional aviation growth, and timely facility development yields 320 aircraft at GTU by 2006.

Another forecast method utilized is to compare the airport's based aircraft with local resident population tends. **Table 2E** presents historical and forecast based aircraft per 1,000 Georgetown and Williamson County residents.

As indicated in the table, Georgetown has experienced an increase in based aircraft since 1990. The early to mid 1980's witnessed a surge of aircraft ownership, while the late 1980's and early 1990's experienced a general decrease due to a slowing economy and aircraft liability law issues. In 1998, however, based aircraft climbed back to 133 which follows national trends of increased aircraft manufacturing and the steady increase in aircraft ownership. From 1998 to 2000, based aircraft increased by 135, more than doubling, which can be directly related to the shift from Austin Mueller to Bergstrom and the closing of Austin Executive Airport.

Georgetown Municipal Airport based aircraft per 1,000 Georgetown residents has fluctuated between a low of 5.75 in 1992 to a high of 9.46 in 2000. This trend is very similar to that experienced at general aviation airports across the country as the economy and legislation suppressed aircraft ownership in the late 80's. However, the trend has since reversed itself as new legislation has opened the doors to aircraft production and the economy has been strong.

Two forecasts were produced using the ratio of based aircraft per 1,000 Georgetown residents. First, a constant share forecast considered that the airport's based aircraft per 1,000 Georgetown residents would remain at 9.46. This would likely occur if aviation growth remains constant with population growth of the area. This projection yields 433 based aircraft at Georgetown by 2006.

Generally, based aircraft per 1,000 residents follows a decreasing trend. This decreasing trend typically indicates that aircraft ownership does not maintain the same growth rates of the local population. A decreasing trend forecast, as presented in **Table 2E** indicates 361 based aircraft at the airport by 2006.

As previously mentioned, a forecast considering aircraft ownership per 1,000 residents in Williamson County was developed. As with the previous forecast, two projections were considered, a constant and decreasing ratio of based aircraft per 1,000 residents. Following the constant share ratio of 1.07 as presented in **Table 2E**, the airport would have 369 aircraft by 2006. It is quite possible that aircraft based at GTU will not keep up with the population growth of the county. Thus, a decreasing ratio projection was developed which yields 344 based aircraft by 2006.

A summary of historical and forecast based aircraft is illustrated on **Exhibit 2C**. The projections depicted on the exhibit illustrate an envelope of potential based aircraft at Georgetown Municipal Airport over the next 10 years. Given the lack of a reliever airport within the city of Austin, it is very likely that aircraft owners in the Austin area will increasingly utilize outlying airports such as Georgetown. For this reason, the lower end of the planning envelope does not represent an adequate tool for the city for airport noise and land use planning. A combination of projections representing the middle of the planning envelope appears to be the most reasonable for the purposes of this study. Because of the constraints to the unlimited growth potential it is very likely that the

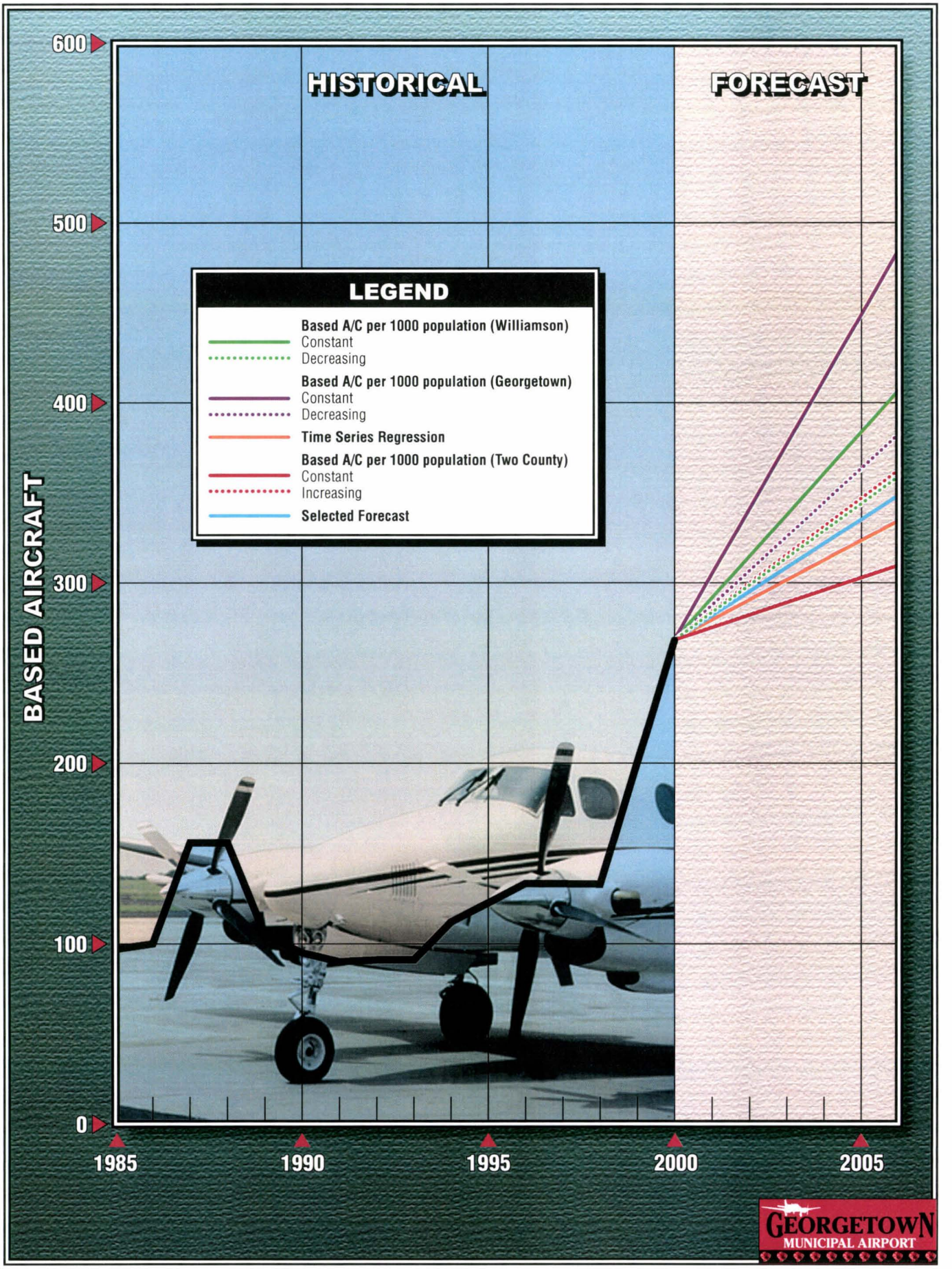


Exhibit 2C
BASED AIRCRAFT FORECAST

TABLE 2E
Aircraft Per 1,000 Resident Population Projections

		Georgetown		Williamson County	
Year	**Based A/C**	**Population[1]**	**Aircraft/1000**	**Population[1]**	**Aircraft/1000**
1985	97	N/A	N/A	110,652	0.88
1986	100	N/A	N/A	119,708	0.84
1987	156	N/A	N/A	126,561	1.23
1988	156	N/A	N/A	129,610	1.20
1989	105	N/A	N/A	135,714	0.77
1990	95	14,842	6.40	140,613	0.68
1991	90	15,118	5.95	146,650	0.61
1992	91	15,825	5.75	153,398	0.59
1993	91	16,752	5.43	162,224	0.56
1994	112	17,585	6.37	172,706	0.65
1996	133	21,445	6.20	197,822	0.67
1998	133	26,576	5.00	223,693	0.59
1999	201	27,458	7.32	240,885	0.83
2000	268	28,339	9.46	249,967	1.07

CONSTANT SHARE PROJECTION

	Per 1,000 Georgetown Residents			Per 1,000 Williamson Residents		
Year	**Based A/C**	**Population[1]**	**Ratio**	**Based A/C**	**Population[1]**	**Ratio**
2006	433	45,817	9.46	369	344,422	1.07

DECREASING SHARE PROJECTIONS

	Per 1,000 Georgetown Residents			Per 1,000 Williamson Residents		
Year	**Based A/C**	**Population[1]**	**Ratio**	**Based A/C**	**Population[1]**	**Ratio**
2006	367	45,817	8.00	344	344,422	1.00

Sources: (1) Historic City and MSA Populations from U.S. Census Bureau
(2) Forecasts from Texas Water Development Board, 2002 State Water Plan, County and MSA employment + PCPI from Woods and Poole CEDDS 2001, and U.S. Census Bureau. Forecasts for 2006 were interpolated by Coffman Associates, Inc.

airport will follow the high end of the planning envelope depicted on **Exhibit 2C**. Furthermore, the growth spike experienced at GTU over the last three years is not likely to be matched anytime soon as it was caused simply by the need to accommodate aircraft from Austin Executive and Mueller International. The construction of a new airport will take a minimum of seven to ten years to occur, thus, for planning purposes will not likely impact the aircraft totals at GTU over the next ten years. The following is the based aircraft forecast for Georgetown Municipal Airport:

- 2006 - 320

BASED AIRCRAFT FLEET MIX PROJECTION

The existing based aircraft fleet mix is comprised of single and multi-engine piston-powered aircraft, helicopters, and also includes business turboprop and turbojet aircraft.

As detailed previously, the national trend is toward a larger percentage of sophisticated turboprop, jet aircraft, and helicopters in the national fleet. Growth within each based aircraft category at the airport has been determined by comparison with national projections (which reflect current aircraft production) and consideration of local economic conditions. The projected trend of based aircraft at Georgetown Municipal includes a growing number of single and multi-engine aircraft and turboprop aircraft. However, strong growth in business turbojet aircraft is projected for the airport through the planning period, consistent with national trends. The based aircraft fleet mix projection for Georgetown Municipal Airport is summarized in **Table 2F**.

TABLE 2F
Fleet Mix Forecast
Georgetown Municipal Airport

	EXISTING		FORECAST	
Type	**2000**	**%**	**2006**	**%**
Single Engine	211	78.73	245	77.00
Multi-Engine	20	7.46	26	8.00
Turboprop	20	7.46	26	8.00
Jet	10	3.73	13	4.00
Helicopter	7	2.62	10	3.00
Totals	**268**	**100.00%**	**320**	**100.00%**

Currently, single engine aircraft compose the largest segment of aircraft at GTU. Although the future based aircraft mix will continue to be dominated by single engine aircraft, the percentages of helicopters, multi-engine, turboprop, and turbojet aircraft have been forecast to increase, while single engine based aircraft are forecast to decrease.

ANNUAL OPERATIONS

There are two types of operations at an airport: local and itinerant. A local operation is a takeoff 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 as business aircraft are used primarily to carry people from one location to another.

Due to the absence of an airport traffic control tower, actual annualized operational counts are not available for Georgetown Municipal Airport. In 2000, however, a series of counts lasting two weeks each quarter were conducted. Estimates were then extrapolated to provide a full year's operational level. From the count, it was estimated that the airport experienced 99,368 operations.

For a historical reference, however, only general estimates of aircraft operations based on periodic observations are available. Historical aircraft operations for the airport have been recorded by the FAA on the 5010-1, Airport Master Record Form. Airport management has estimated annual operations for the FAA in the past. **Table 2G** presents historical operations for Georgetown Municipal Airport.

Projections of annual operations have been developed by examining the number of operations per based aircraft. Typically, operations per based aircraft can range between 300 and 1,000 at airports similar to Georgetown Municipal Airport. Airports with higher training operations (local operations) will have a higher operation per based aircraft ratio, whereas airports with a higher percentage of transient aircraft operations will have a lower ratio.

In attempts to quantify more reliably than simply estimating airport operations, TxDOT established an on-going operations monitoring system. The goal of this program was to ultimately establish a model that will provide more accurate counts. TxDOT's model indicates that for general aviation airports, annual operations typically equate to approximately 300 operations per based aircraft. For reliever airports, especially those with significant training operations, this number can increase upwards of 1,000. Typically, however, airports similar to GTU range near 500. Thus, for planning purposes, annual operations per based aircraft will be forecast showing a trend towards 500 operations per based aircraft.

The FAA projects an increase in aircraft utilization and the number of general aviation hours flown. This forecast supports future growth in annual operations at Georgetown Municipal Airport. **Table 2G** presents annual operations forecasts for 2006. As indicated in the table, total general aviation operations at Georgetown Municipal Airport are forecast to reach 160,000 by 2006 using the 500 operations per based aircraft levels forecast. It is assumed that local, or training operations will continue to dominate the traffic. Future local operations have been forecast as 60 percent of total general aviation operations, or 96,000. Itinerant traffic is forecast to remain at 40 percent of total annual general aviation operations reaching 64,000 by 2006.

TABLE 2G
General Aviation Operations Projections
Georgetown Municipal Airport

Year	Local	Itinerant	Total	Based AC	Ops/Based
1985	55,000	50,000	105,000	97	1,098
1986	56,700	51,500	108,200	100	1,097
1987	56,700	51,500	108,200	156	703
1988	46,800	31,200	78,000	156	510
1989	31,500	21,000	52,500	105	514
1990	28,500	18,000	46,500	95	505
1991	28,500	18,000	46,500	90	533
1992	28,500	18,000	46,500	91	527
1993	28,500	18,000	46,500	91	529
1994	28,500	18,000	46,500	112	429
1996	56,659	28,730	85,389	133	655
1998	56,659	28,730	85,389	133	655
1999	78,053	35,259	113,312	201	564
2000[1]	59,330	40,038	99,368	268	371
FORECAST[2]					
2006	96,000	64,000	160,000	320	500

Source: Federal Aviation Administration 5010-1 Airport Master Record Form.
[1] 2000 operations developed via a series of quarterly traffic counts extrapolated to provide a full year's operations.
[2] Coffman Associates' analyses.

AIR TAXI

As shown on FAA Form 5010, airport operational estimates indicate that air taxi operations totaled 800 in 2000. Future operational estimates will hold this level constant at 800 throughout the planning period. This number could increase if an air taxi operator were to base at Georgetown Municipal Airport, or if FAA changes criteria for fractional ownership programs. The FAA is considering a requirement for fractional ownership programs to operate under F.A.R. Part 135 rules and regulations. If this change is made, it is conceivable that GTU could experience twice the forecasted amount of air taxi operations. At this time, however, it is not believed that the FAA will make this change. It is assumed that the air taxi operations are included in the forecast of itinerant operations on **Table 2G**.

MILITARY ACTIVITY

Projecting future military utilization of an airport is particularly difficult as local missions may change with little notice. However, existing operations and aircraft mix may be confirmed for their impact on facility planning. As indicated by airport's previous master plan and the FAA TAF document, historical military operations have accounted for approximately 700

itinerant operations annually. Military operations consist primarily of helicopter and turboprop activity.

Military aircraft utilize Georgetown typically for flight training operations (instrument approaches) or for fueling stopovers. For planning purposes these operations have been forecast to remain steady at 700 annually through the planning period. It is assumed that the military operations are included in the forecast of itinerant operations in **Table 2G**.

FLEET MIX OPERATIONAL FORECASTS

With or without the aid of an airport traffic control tower, one of the most difficult forecasts to develop is the operational mix projection. Air traffic control is responsible for counting aircraft operations by generalized type, not specific aircraft type. For development of noise contours, however, the operational fleet mix breakdown is required.

Through interviews with airport staff and fixed based operators located at GTU, it has been observed that approximately 60 percent of all operations at GTU are conducted as training operations, or touch-and-go's. Of the 60 percent local operations, the vast majority is by single engine piston aircraft including infrequent helicopters. It has been estimated that up to ten percent of the training operations are conducted by multi-engine piston aircraft. These estimates do not include turbine training operations, as turbine aircraft rarely conduct touch-and-go operations at general aviation airports.

Transient operations have been broken down into two distinct categories: turbine and piston. Similar to the training operations, it is estimated that the vast majority of transient operations are conducted by piston aircraft. This can be easily verified by simply examining based aircraft at GTU. As was presented in **Table 2F**, more than 78 percent of the airport's based aircraft are single engine piston and another 7.46 percent are multi-engine piston. These aircraft are more numerous in the national fleet and are less expensive to operate, thus, they tend to dominate small airport operations.

Business aircraft, including both turboprop and turbojet aircraft comprise only eleven percent of total based aircraft at GTU. The largest share of business jets based at GTU fall in the Cessna Citation family of aircraft. Cessna Citations (excluding Model X) are relatively small and efficient to operate. These aircraft can typically operate at airports with less than 6,000 feet of runway, even under higher temperature conditions. For these reasons, the Citation is a popular aircraft in the corporate fleet providing a low cost and high utility to its owners/leasors.

It is assumed that the majority of jet operations will be conducted by Citation "type" aircraft. Other jets such as the Lear and Gulfstream family will likely consist of up to 1.2 percent of the turbojet aircraft operations.

Table 2H presents operational fleet mix forecasts for GTU through 2006. It is important to note that the year 2001 is being utilized as a base year. It was assumed that 2000 operational counts are representative of 2001, thus, will be utilized for preparation of the current airport noise exposure contours.

TABLE 2H Operational Fleet Mix Projections				
ITINERANT OPERATIONS				
Type	**2003[1]**	**% of Total**	**2008[1]**	**% of Total**
Single Engine				
Light - Fixed	16,015	40.0%	24,000	37.5%
Light - Variable	14,015	35.0%	22,080	34.5%
Subtotal	*30,030*	*75.0%*	*46,080*	*72.0%*
Twin				
Beech Baron	4,004	10.0%	6,400	10.0%
Cessna 441	2,002	5.0%	3,840	6.0%
King Air	2,002	5.0%	3,840	6.0%
Subtotal	*8,008*	*20.0%*	*14,080*	*22.0%*
Jet				
Citation I, II, V	450	1.1%	750	1.2%
Citation III, VI, VII	450	1.1%	1,280	2.0%
Gulfstream III	50	0.1%	100	0.2%
Lear 35/55	450	1.1%	750	1.2%
Subtotal	*1,400*	*3.5%*	*2,880*	*4.5%*
Helicopter				
Robinson 22	400	1.0%	640	1.0%
Jet Ranger	200	0.5%	320	0.5%
Subtotal	*600*	*1.5%*	*960*	*1.5%*
Total Itinerant	**40,038**	**100.0%**	**64,000**	**100.0%**
LOCAL OPERATIONS				
Type	**2003**	**% of Total**	**2008**	**% of Total**
Light - Fixed	23,132	40.0%	38,400	40.0%
Light - Variable	23,132	40.0%	38,400	40.0%
Beech Baron	11,566	20.0%	19,200	20.0%
Total Local	59,330	100.0%	96,000	100.0%
Total Annual	99,368	100.0%	160,000	100.0%

[1] Year 2001 operations are based on a series of operational counts lasting two weeks each quarter during calendar year 2000 and extrapolated to provide a full year's operations. A review of current fuel sales and based aircraft in Appendix E indicates no significant change in operations.
Note: Rounded to nearest 10th.

SUMMARY

This chapter has outlined aviation demand levels anticipated over the next ten years at Georgetown Municipal Airport. These forecasts, depicted on **Exhibit 2D**, have been developed through both analytical analyses and judgmental processes. National, regional, local aviation trends, and planned facilities, along with economic and demographic data, were all utilized in formulating the aviation demand forecast projections.

Future aircraft and operations growth at Georgetown will be dependent upon several factors: economic conditions, the increase in area aircraft ownership, and the lack of another reliever airport for the Austin area.

All economic indicators from the 2000 census point to a growing local economy. The City of Georgetown experienced the largest annual percent population growth from 1990 to 2000 within the Austin-San Marcos MSA. Substantial growth was also seen in employment and per capita personal income.

Georgetown Municipal and San Marcos Municipal Airports continue to be the only viable general aviation airport options for aircraft owners, especially those who operate corporate aircraft. Both of these airports have experienced significant growth over the last three years. Given the lack of other viable airports, Georgetown and San Marcos will most likely accommodate a majority of the new general aviation demand in the region.

The Noise Exposure Maps (NEM) document, which includes the first four chapters of the study, was first published in March 2002. During the August 27, 2002 City Council meeting, the Council voted not to forward the Noise Exposure Maps to the Federal Aviation Administration (FAA) for acceptance and to stop work on the development of the Noise Compatibility Program. Since that time, the City Council has re-authorized efforts to complete the Georgetown Municipal Airport Noise Compatibility Study.

Section 150.21 of Federal Aviation Regulation (FAR) Part 150 outlines the general requirements for NEM documentation. Two NEM maps are required, the existing year and five-year noise conditions. If the existing year condition does not match the year on the submittal letter, the airport operator must verify in writing that data in the NEM documentation are representative of existing and five-year forecast condition. Information provided in Appendix E indicates the information used to establish the 2001 (existing) and five-year conditions are still representative existing and five-year conditions.

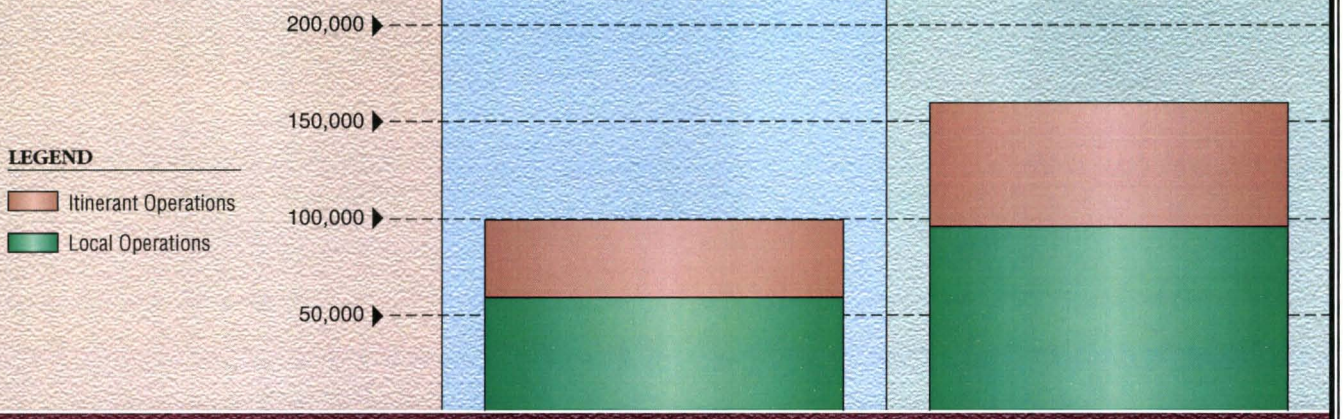
Georgetown Municipal Airport does not have an airport traffic control tower so a direct comparison of aircraft operations data is not possible. Therefore, the only means for determining if a significant change has occurred is a comparison of other factors such as airport facilities, airport tenants, based aircraft, and fuel sales. **Appendix E** compares 2001 and 2003 data for these four variables.

Georgetown Municipal Airport has not experienced any significant changes to the airport facilities, number of operator/tenants, based aircraft, or fuel sales since 2001. While these variables are not a perfect indicator of airport activity at Georgetown Municipal Airport, they do provide some insight into the stability of airport activity. Based on this information, it is feasible to assume the 2001 baseline information is a fair representation of 2003 activity and the five-year activity forecast is still valid. Therefore, the 2001 contours will be re-labeled as 2003 and the 2006 contours will be re-labeled as 2008 contours.

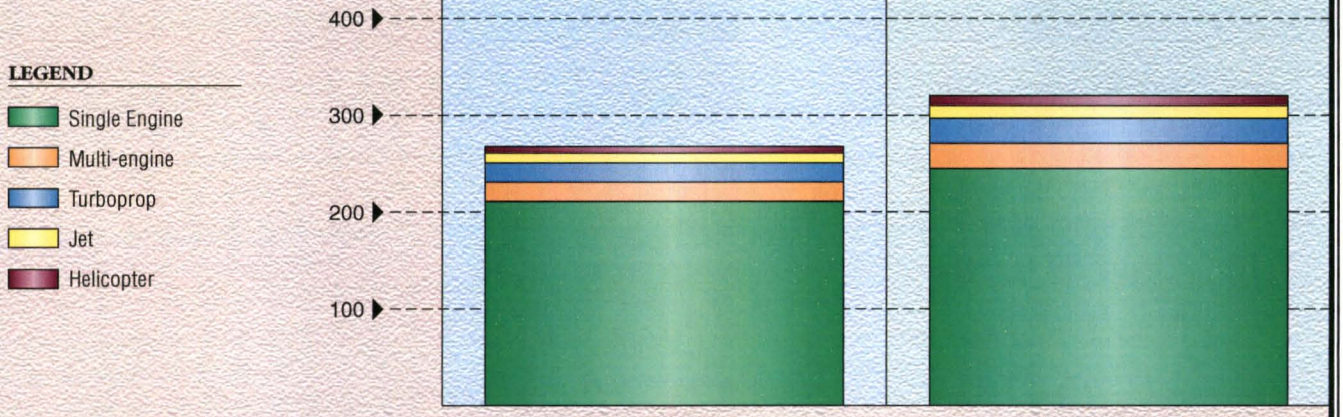
01SP03-2D-9/7/01

SUMMARY OF AVIATION ACTIVITY FORECASTS

CATEGORY	Historical 2003[1]	Forecasts 2008[1]
ANNUAL OPERATIONS		
Itinerant	40,038	64,000
Local	59,330	96,000
Total Operations	***99,368***	***160,000***



BASED AIRCRAFT		
Single Engine	211	245
Multi-engine	20	26
Turboprop	20	26
Jet	10	13
Helicopter	7	10
Total Based Aircraft	***268***	***320***



[1] Year 2001 operations are based on a series of operational counts lasting two weeks each quarter during calendar year 2000 and extrapolated to provide a full year's operations. A review of current fuel sales and based aircraft in Appendix E indicates no significant change in operations.

GEORGETOWN MUNICIPAL AIRPORT

Exhibit 2D
AVIATION FORECAST SUMMARY