CHAPTER TWO - AVIATION DEMAND FORECASTS

An important factor when planning the future needs of an airport involves a definition of aviation demand that may reasonably be expected to occur during the useful life of the facility's key components. For a general aviation reliever airport, such as Dallas Executive Airport, this involves projecting potential aviation demand for a 20-year timeframe. In this Master Plan, forecasts of based aircraft and annual aircraft operations (takeoffs and landings) will be considered and serve as the basis for facility planning.

The Federal Aviation Administration (FAA) has oversight responsibility to review and approve aviation forecasts developed in conjunction with airport planning studies. In the State of Texas, this responsibility has been granted to the Texas Department of Transportation - Aviation Division (TxDOT), which reviews such forecasts with the objective of comparing them to the FAA *Terminal Area Forecast* (TAF) and the *National Plan of Integrated Airport Systems* (NPIAS). In addition, aviation activity forecasts are an important input to the benefit-cost analyses associated with airport development, and TxDOT reviews these analyses when funding requests are submitted.

As stated in FAA Order 5090.3C, *Field Formulation of the National Plan of Integrated Airport Systems* (NPIAS), dated December 4, 2004, forecasts should:

- Be realistic
- Be based on the latest available data
- Reflect current conditions at the airport
- Be supported by information in the study
- Provide adequate justification for airport planning and development

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

Aviation activity can be influenced by variables on the local, regional, and national levels, making it virtually impossible to predict year-to-year fluctuations of activity over 20 years with any certainty. 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 for Dallas Executive Airport was produced following these basic guidelines. Existing and available forecasts are examined and compared against current and historic activity. The historical aviation activity is then examined along with other factors and trends that can affect demand. The intent is to provide an updated set of aviation-demand projections for Dallas Executive Airport that will permit the City of Dallas – Aviation Department to make planning adjustments as necessary to maintain a viable, efficient, and cost-effective facility.

NATIONAL AVIATION TRENDS

Each year, the FAA updates and publishes a national aviation forecast. Included in this publication are forecasts for passengers, airlines, air cargo, general aviation, and FAA workload measures. The forecasts are prepared to meet the budget and planning needs of the constituent units of the FAA and to provide information that can be used by state and local authorities, the aviation industry, and the general public.

The current edition when this chapter was prepared was FAA *Aerospace Forecast - Fiscal Years 2011-2031*, published in March 2011. The forecasts use the economic performance of the United States as an indicator of future aviation industry growth. Similar economic analyses are applied to the outlook for aviation growth in international markets.

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 manufacture 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.

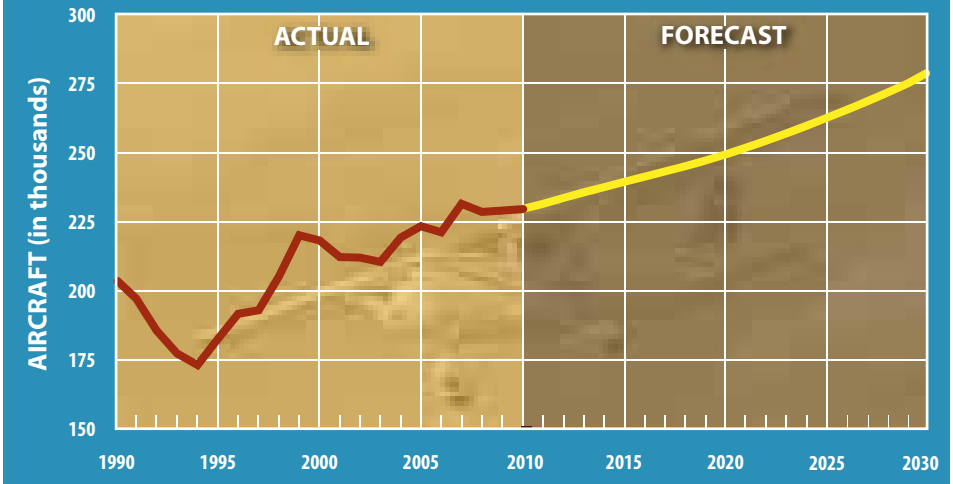
In the seven years prior to the events of September 11, 2001, the U.S. civil aviation industry experienced unprecedented growth in demand and profits. The impacts to the economy and aviation industry from the events of 9/11 were immediate and significant. The economic climate and aviation industry had been recovering until early 2008 when it became clear that an economic downturn was underway. High oil prices and an economic recession caused general aviation activity at FAA air traffic facilities to fall sharply in 2008, declining by 5.6 percent. The downturn in the economy has dampened the near-term prospects for the general aviation industry. As the U.S. and world economy recovers, general aviation demand is anticipated to rebound and grow.

According to the National Bureau of Economic Research, the U.S. economy entered into recession in December 2007. As the economic downturn gathered momentum, the new Administration and Congress passed the *American Recovery and Reinvestment Act* (ARRA) in February 2009, which was estimated to have a total fiscal impact of $787 billion. Data shows that the recession "bottomed-out" in June 2009 and the freefall in economic activity tempered during the third quarter of 2009. The U.S. economy grew for the first time in the fourth quarter of 2009, with output increasing by 2.2 percent. Furthermore, the consumer price index (CPI) has been on the increase again after experiencing a slight decline in 2008 and early 2009. While the economy continues to shows signs of positive recovery, overall growth has

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

	2010	2016	2021	2026	2031
FIXED WING					
PISTON					
Single Engine	139.8	136.5	137.3	141.2	147.7
Multi-Engine	16.3	15.5	14.8	14.2	13.6
TURBINE					
Turboprop	9.2	10.0	10.7	11.4	12.3
Turbojet	11.7	14.7	18.2	22.4	27.4
ROTORCRAFT					
Piston	3.6	4.3	5.0	5.8	6.6
Turbine	6.6	7.6	8.6	9.7	10.8
EXPERIMENTAL	**24.6**	**27.2**	**29.1**	**31.1**	**33.0**
SPORT AIRCRAFT	**7.0**	**9.4**	**10.9**	**12.4**	**13.9**
OTHER	**5.5**	**5.5**	**5.4**	**5.4**	**5.4**
TOTAL	**224.2**	**230.7**	**240.4**	**253.5**	**270.9**

Note: Aircraft numbers are in thousands.



Source: FAA Aerospace Forecasts, Fiscal Years 2011-2031.

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

remained slow. Sustained economic growth above three percent is not expected until 2012. Beyond 2015, U.S. real gross domestic product (GDP) growth slows to around 2.7 percent annually through the forecast period of this study.

In 2010, there were an estimated 224,172 active general aviation aircraft in the United States. **Exhibit 2A** depicts the FAA forecast for active general aviation aircraft. The FAA projects an average annual increase of 0.9 percent through 2031, resulting in 270,920 active aircraft. Active piston-powered aircraft are expected to decline through 2018, and then gradually increase to 168,140 by 2031 for an overall average annual increase of 0.2 percent. This is driven primarily by a 2.9 percent annual increase in piston-powered rotorcraft and growth in experimental and sport aircraft, as single engine fixed-wing piston aircraft are projected to increase at just 0.3 percent annually and multi-engine fixed-wing piston aircraft are projected to decrease by 0.9 percent per year. This is due, in part, to declining numbers of multi-engine piston aircraft and the expectation that the new, light sport aircraft and the relatively inexpensive very light jets (VLJ) will dilute or weaken the replacement market for piston aircraft. **Table 2A** presents historical general aviation aircraft shipments and billings since 1994.

New models of business jets are also stimulating interest for the high-end market. The FAA expects the business segment to expand at a faster rate than personal/sport flying. Safety and security concerns combined with increased processing time at commercial terminals make business/corporate flying an attractive alternative. 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 4.2 percent. The total number of jets in the general aviation fleet is projected to grow from 11,568 in 2010, to 27,395 by 2031.

Since the introduction of the twin-engine VLJ, its impact on the general aviation industry has been the source of much debate. The lower acquisition and operating costs of the VLJs were believed to have the potential to revolutionize the business jet market, particularly by being able to sustain a true on-demand air-taxi service. While initial forecasts called for over 400 aircraft to be delivered a year, events such as the recession along with the bankruptcy of Eclipse and DayJet have led the FAA to temper more recent forecasts. The introduction of the Embraer's Phenom 100 to the market has helped boost the turbine market. Despite that, the impacts of the recession have led to dampened expectations. VLJs are forecast to experience slight growth through the remainder of the forecast period.

Owners of ultralight aircraft began registering their aircraft as "light sport" aircraft in 2005. At the end of 2010, a total of 6,996 aircraft were estimated to be in this category. The FAA estimates this fleet will increase by approximately 450 aircraft per year until 2013, and

Table 2A: ANNUAL GENERAL AVIATION AIRPLANE SHIPMENTS MANUFACTURED WORLDWIDE AND FACTORY NET BILLINGS

Year	Total	SEP	MEP	TP	J	Net Billings ($millions)
1994	1,132	544	77	233	278	3,749
1995	1,251	605	61	285	300	4,294
1996	1,437	731	70	320	316	4,936
1997	1,840	1043	80	279	438	7,170
1998	2,457	1508	98	336	515	8,604
1999	2,808	1689	112	340	667	11,560
2000	3,147	1,877	103	415	752	13,496
2001	2,998	1,645	147	422	784	13,868
2002	2,677	1,591	130	280	676	11,778
2003	2,686	1,825	71	272	518	9,998
2004	2,961	1,999	52	319	591	11,918
2005	3,590	2,326	139	375	750	15,156
2006	4,053	2,513	242	412	886	18,815
2007	4,270	2,417	258	459	1,136	21,826
2008	3,967	1,943	176	535	1,313	24,766
2009	2,276	895	70	441	870	19,466
2010	2,015	781	108	363	763	19,290

SEP - Single Engine Piston; MEP - Multi-Engine Piston; TP - Turboprop; J - Turbofan/Turbojet

Source: General Aviation Manufacturers Association 2010 Statbook

then taper off to about 300 per year. By 2031, a total of 13,870 light sport aircraft are projected to be in the fleet.

Aircraft utilization rates are projected to increase through the forecast period. The number of general aviation hours flown is projected to increase at 2.2 percent annually. Similar to active aircraft projections, there is projected disparity between piston and turbine aircraft hours flown. Hours flown in turbine aircraft are expected to increase at 3.7 percent annually, compared with 0.8 percent for piston-powered aircraft. Jet aircraft hours flown are projected to increase at 5.3 percent annually over the next 20 years. The sport aircraft fleet is anticipated to experience a 5.4 percent average annual growth rate in hours flown through 2031.

The total general aviation pilot population is projected to increase by 42,000 in the next 20 years, reaching 527,660 in 2031, which represents an average annual growth rate of 0.5 percent. The student pilot population is forecast to increase at an annual rate of 0.1 percent, reaching a total of 120,600 in 2031. Growth rates for other pilot categories over the forecast period are as follows: recreational pilots remaining constant; private pilots increasing by 0.3 percent; commercial pilots increasing 0.5 percent; airline transport pilots increasing 0.7 percent; rotorcraft-only pilots increasing 1.5 percent; and glider-only pilots increasing 0.2 percent. The sport pilot is expected to grow significantly through 2031 at 6.1 percent annually.

Over the past several years, the general aviation industry has launched a series of programs and initiatives whose main goals are to promote and assure future growth within the industry. Several programs are intended to promote growth in new pilot starts and introduce people to general aviation. "Project Pilot," sponsored by the Aircraft Owners and Pilots Association (AOPA), promotes the training of new pilots in order to increase and maintain the size of the pilot population. The Experimental Aircraft Association (EAA) promotes the "Young Eagles" program which introduces young children to aviation by offering them a free airplane ride courtesy of aircraft owners who are part of the association. Over the years, programs such as these have played an important role in the success of general aviation and will continue to be vital to its growth in the future.

SOCIOECONOMIC CHARACTERISTICS

A variety of historical and forecast socioeconomic data has been collected for use in various elements of this Master Plan. This data provides essential background information for use in determining aviation service level requirements. Aviation forecasts are related to the population base and the economic strength of the region; therefore, it is necessary to have an understanding of the socioeconomic outlook for the airport service area. For this study, socioeconomic variables for the City of Dallas and surrounding suburbs have been considered. Furthermore, socioeconomic data for the Counties of Dallas and Tarrant has also been analyzed.

A summary of population and employment data covering the greater Dallas/Fort Worth Metroplex is presented in **Table 2B**. With this information, analysis will be undertaken to develop forecasts of future aviation demand that can be reasonably expected at Dallas Executive Airport.

Table 2B: REGIONAL SOCIOECONOMIC PROJECTIONS

	HISTORICAL		PROJECTIONS			
	2000	2010	2016	2021	2031	AAGR (2010-2031)
POPULATION DATA						
City of Dallas	1,188,580	1,197,816	1,323,765	1,422,803	1,503,247	1.09%
Dallas County	2,218,899	2,368,139	2,593,806	2,774,941	2,970,815	1.09%
Tarrant County	1,446,219	1,809,034	1,956,762	2,087,908	2,366,880	1.29%
EMPLOYMENT DATA						
Dallas County	1,884,030	1,905,548	2,072,317	2,170,441	2,426,788	1.16%
Tarrant County	882,071	1,041,935	1,162,531	1,273,624	1,528,674	1.84%

Source: North Central Texas Council of Governments; Texas Workforce Commission; Woods & Poole Complete Economic and Demographic Data (2011)

POPULATION TRENDS

Population is one of the most important elements to consider when planning for the future needs of the airport. The current population of the City of Dallas is approximately 1,197,816 people. Population in the city is projected to reach 1,503,247 by 2031, increasing at an average annual growth rate (AAGR) of 1.09 percent. This projection constitutes a slightly greater population growth rate than has been experienced between 2000 and 2010. Similarly, Dallas County's population is also forecast to grow at an AAGR of 1.09 percent. Tarrant County is forecast to increase at even a higher rate, at 1.29 percent, through 2031.

EMPLOYMENT TRENDS

Employment has historically experienced weaker growth between 2000 and 2010. The two economic recessions experienced during this period have negatively influenced employment in the Dallas/Fort Worth Metroplex. Projections for future employment in Dallas County, however, are for an increased AAGR of 1.16 percent through 2031. Tarrant County employment is projected to continue an even stronger growth rate through 2031. If realized, the projected employment growth for the area could provide a strong base for increased aviation demand for the region.

AIRPORT SERVICE AREA

The initial step in determining the aviation demand for an airport is to define its generalized service area for various segments of aviation the airport can accommodate. The airport service area is determined primarily by

evaluating the location of competing airports, their capabilities, their services, and their relative attraction and convenience. In determining the aviation demand for an airport, it is necessary to identify the role of that airport as well as the specific areas of aviation demand the airport is intended to serve. The primary role of Dallas Executive Airport is to serve general aviation demand in the area.

The airport service area is a geographical area where there is a potential market for airport services. Access to general aviation airports and transportation networks enter into the equation to determine the size of a service area. Also to be factored are subjective criteria, such as the quality of aviation facilities and services.

As in any business enterprise, the more attractive the facility is in terms of services and capabilities, the more competitive it will be in the market. If an airport's attractiveness increases in relation to nearby airports, so will the size of the service area. If facilities are adequate and rates and fees are competitive at Dallas Executive Airport, some level of aviation activity might be attracted to the airport from more distant locales.

Defining a service area for an airport is also important in the forecasting process. Once a general service area is identified, various statistical comparisons can be made for projecting aviation demand. For example, in rural areas, where there may be one general aviation airport in each county, the service area could reasonably be defined as the entire county. This would facilitate comparisons to county population and other factors pertaining to that particular county for forecasting purposes.

In urban areas, where there are many general aviation airports, the definition of a service area is not as simple. Aircraft owners in urban areas have many more choices when it comes to basing their aircraft. The number one reason aircraft owners select an airport at which to base their aircraft is convenience to home or work. Other reasons may include the capability of the runway system, services available, availability of hangar space, airport congestion, etc.

A defined service area is developed for the purposes of identifying a geographic area from which to further develop aviation demand projections. The service area will generally represent where most, but not all, based aircraft will come from. It is not unusual for some based aircraft to be registered outside the region or even outside the state. Particularly in urban areas, airport service areas will likely overlap to some extent as well.

As previously discussed, the generalized service area of an airport can be determined by its proximity to other airports providing similar levels of service. Dallas Executive Airport is one of several airports serving general aviation needs in the Dallas/ Fort Worth Metroplex. Chapter One detailed several of these airports that provide a wide range of general aviation services to include aircraft fuel, tiedowns, hangar storage, and aircraft maintenance, among others.

The service area for Dallas Executive Airport is primarily limited to the east, south, and west by the proximity of other general aviation airports. Mesquite Metro, Lancaster Regional, and Mid-Way Regional Airports are all located between 10 and 17 nautical miles east and south of Dallas Executive Airport and offer an array of general aviation services, including 100LL and Jet A fuel, aircraft maintenance, hangar storage, etc. It is estimated that approximately 400 aircraft are based at these three airports. To the west, Grand Prairie Municipal and Arlington Municipal Airports also provide a variety of services to general aviation users and combined are home to approximately 445 based aircraft. Of these airports, only Grand Prairie Municipal is somewhat limited by an existing runway length of 4,001 feet and with little developable space available for future growth. The remaining airports listed all provide a runway length of at least 6,000 feet.

To the north and northwest of Dallas Executive Airport is Dallas Love Field and Dallas/Fort Worth International Airport. Although mainly served by commercial airlines, both airports support general aviation corporate operations; however, a trend continues to show general aviation activities declining over the past several years. This can be attributed to the airports' main focus on accommodating commercial airline and air cargo services. It should be noted, however, that DFW has recently expanded general aviation facilities allowing for it to better serve corporate operators and Dallas Love Field is home to several fixed base operators (FBOs) that provide a full line of general aviation services.

Addison Airport, located approximately 17 nautical miles north of Dallas Executive Airport, is a prominent general aviation reliever airport serving the needs of the Town of Addison, north Dallas, and surrounding areas. Home to over 600 based aircraft, a 7,200-foot runway, and wide range of aviation services, Addison limits the Dallas Executive Airport service area to the north.

The previously mentioned airports' available levels of service and facilities will play a role in determining Dallas Executive's service area. However, Dallas Executive Airport remains a very important facility that meets the needs of general aviation operators in the region. This includes recreational flying in single engine aircraft up to corporate business jets and charter operators. The airport is also located in close proximity to the downtown Dallas metropolitan area and is provided ideal highway access to the greater Dallas/Fort Worth Metroplex. In addition, Dallas Executive Airport is a designated reliever airport. In this capacity, the airport should be maintained to accommodate a full range of general aviation aircraft.

Considering all previous factors, a primary service area has been determined and illustrated on **Exhibit 2B**. The primary service area extends north and east and encompasses much of the City of Dallas and its entire central business district. To the south, the service area includes the Cities of Duncanville, Cedar Hills, and DeSoto as well as portions of Lancaster. West and northwest of the airport, the service area includes the Cities of Grand Prairie and Irving. It should be noted that socioeconomic indicators for the primary communities within the Dallas Executive Airport service area have been further broken down and referenced in the forecast section to follow.

AVIATION FORECAST METHODOLOGY

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

Beyond five years, the predictive reliability of the forecasts can diminish. Therefore, it is prudent for the airport to update the forecasts, reassess the assumptions originally made, and revise the forecasts based on the current airport and industry conditions. Facility and financial planning usually require at least a 10-year preview since it often takes several years to complete a major facility development program. However, it is important to use forecasts which do not overestimate revenue-generating capabilities or understate demand for facilities needed to meet public (user) needs.

Exhibit 2B: SERVICE AREA

A wide range of factors are known to influence the aviation industry and can have significant impacts on the extent and nature of activity occurring in both the local and national markets. Technological advances in aviation have historically altered and will continue to change the growth rates in aviation demand over time. A recent example is the substantial growth in the production and delivery of business jet aircraft, which resulted in a growth rate that far exceeded expectations. Such changes are difficult to predict, but over time, reasonable growth trends can be identified. Using a broad spectrum of demographic, economic, and industry data, forecasts for Dallas Executive Airport have been developed. Several standard statistical methods have been considered to generate various projections of aviation demand.

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

Market share analysis involves a historical review of 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.

Utilizing these statistical methods, available existing forecasts, and analyst expertise, forecasts of aviation demand for Dallas Executive Airport have been developed. The remainder of this chapter presents the aviation demand forecasts and includes activity in two broad categories: based aircraft and annual operations.

GENERAL AVIATION FORECASTS

The following forecast analysis examines each of the aviation demand categories expected at Dallas Executive Airport over the next 20 years. Each segment will be examined individually, and then collectively, to provide an understanding of the overall aviation activity at the airport through 2031.

The need for airport facilities at Dallas Executive Airport can be best determined by accounting for forecasts of future aviation demand. The remainder of this chapter presents the forecasts for airport activities and includes the following:

- Based Aircraft
- Based Aircraft Fleet Mix
- General Aviation Operations
- Air Taxi Operations
- Military Operations
- Peaking Characteristics
- Annual Instrument Approaches

BASED AIRCRAFT

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

Determining the number of based aircraft at an airport can be a challenging task. With the transient nature of aircraft storage, it can be hard to arrive at an exact number of based aircraft, as the total is fluid and in a constant state of flux. Future based aircraft at Dallas Executive Airport will depend on several factors, including the economy, available airport facilities, and competing airports. Forecasts assume a reasonably stable and growing economy and continued development of airport facilities necessary to accommodate aviation demand. Competing airports will play a role in deciding regional demand shifts; however, Dallas Executive Airport will fare well in this competition.

Market Share of U.S. Aircraft Fleet

The first method used to project future based aircraft examined historical based aircraft at the airport as a percentage of U.S. active general aviation aircraft. Over the past three years, the airport's market share has slightly increased from 0.0817 percent in 2009 to 0.0824 percent in 2011.

A constant market share projection was first developed. This forecast assumes the airport's share of U.S. active general aviation aircraft will remain constant at 0.0824 percent through the planning period, which yields 223 based aircraft by the year 2031. The second forecast assumes the airport's market share will increase, as it has been trending the past few years. This increasing market share projection yields 252 based aircraft by 2031. These market share projections are presented in **Table 2C**.

Table 2C: MARKET SHARE OF U.S. ACTIVE GENERAL AVIATION AIRCRAFT

Year	Dallas Executive Airport Based Aircraft	U.S. Active General Aviation Aircraft	Market Share of Active General Aviation Aircraft
2009	183	223,920	0.0817%
2010	185	224,172	0.0825%
2011	185	224,475	0.0824%
Constant Market Share			
2016	190	230,650	0.0824%
2021	198	240,045	0.0824%
2031	223	270,920	0.0824%
Increasing Market Share			
2016	196	230,650	0.0850%
2021	211	240,045	0.0880%
2031	252	270,920	0.0930%

Source: Airport Records; FAA Aerospace Forecast Fiscal Years 2011-2031

Ratio of Service Area Population

Trends comparing the number of based aircraft with the service area population were also analyzed. **Table 2D** presents the based aircraft per 1,000 residents in the airport's primary service area. A decreasing ratio of based aircraft per 1,000 residents projection results in population increasing at a greater rate than based aircraft, which follows the trend at the airport in recent years. This is not uncommon in areas where strong population growth is occurring, which is the case in the greater Dallas/ Fort Worth Metroplex. This projection yields 220 based aircraft by 2031. The constant ratio projection of based aircraft per 1,000 residents projection results in based aircraft growing at the same rate as the local population and yields 230 based aircraft by 2031.

Table 2D: BASED AIRCRAFT PER SERVICE AREA POPULATION

Year	Dallas Executive Airport Based Aircraft	Primary Airport Service Area Population	Aircraft per 1,000 Population
2009	183	1,577,009	0.1160
2010	185	1,594,053	0.1161
2011	185	1,611,285	0.1148
Decreasing Ratio Projection			
2016	193	1,700,265	0.1135
2021	201	1,794,158	0.1120
2031	220	1,997,787	0.1100
Constant Ratio Projection			
2016	195	1,700,265	0.1148
2021	206	1,794,158	0.1148
2031	230	1,997,787	0.1148

Source: Airport Records; North Central Texas Council of Governments

Ratio of Service Area Employment

Projections for based aircraft were also made when compared to the service area's employment base. Similar to population trends, the ratio of based aircraft per 1,000 employed residents has decreased in recent years due to positive growth in the job market. As shown in **Table 2E**, the first forecast presents a decreasing ratio of based aircraft per 1,000 residents employed which results in 235 based aircraft by 2031. The second forecast considers a constant ratio projection yielding 245 based aircraft in 2031.

Comparative Forecasts

The previous Master Plan for Dallas Executive Airport completed in 2002 also contains projections for based aircraft. Interpolating the study, based aircraft projections yield 196 aircraft in 2016. Extrapolation of the trend results for years 2021 and 2031 result in 211 and 221 based aircraft, respectively. This equates to a 0.79 percent AAGR.

The FAA TAF also contains projections of based aircraft for Dallas Executive Airport. In 2010, the TAF projected 185 based aircraft for the airport, increasing to only 187 aircraft through 2031.

Based Aircraft Summary

Future aircraft basing at Dallas Executive Airport will depend on

Table 2E: BASED AIRCRAFT PER SERVICE AREA EMPLOYMENT

Year	Dallas Executive Airport Based Aircraft	Primary Airport Service Area Employment	Aircraft per 1,000 Employment
2009	183	1,318,593	0.1388
2010	185	1,337,164	0.1384
2011	185	1,356,001	0.1364
Decreasing Ratio Projection			
2016	196	1,454,222	0.1350
2021	207	1,559,557	0.1330
2031	235	1,793,671	0.1310
Constant Ratio Projection			
2016	198	1,454,222	0.1364
2021	213	1,559,557	0.1364
2031	245	1,793,671	0.1364

Source: Airport Records; North Central Texas Council of Governments

several factors, including the state of the economy, fuel costs, available airport facilities, competing airports, and adjacent development potential. Forecasts assume a reasonably stable and growing economy after a short term decline as is currently being experienced, as well as reasonable development of airport facilities necessary to accommodate aviation demand. Competing airports will play a role in deciding demand; however, Dallas Executive Airport should fare well in this competition as it is served by one of the area's longest runways and is fully capable of being expanded to meet future demand.

Deciding what forecast or combination of forecasts to use in order to arrive at a final based aircraft forecast involves more than just statistical analysis. Consideration must be given to the current and future aviation conditions at the airport. For example, Dallas Executive Airport is an attractive facility that provides an array of aviation services to include multiple FBOs. In addition, the airport has two active runways and a precision instrument landing system (ILS) approach which makes it accessible during poor weather conditions.

Table 2F and **Exhibit 2C** provide a summary of all based aircraft forecasts previously discussed. The City of Dallas has given every indication that it plans to continue strong support of this airport. During the past several years, the city and private investors have made a concerted and successful effort to position the airport to accommodate and accept reasonable levels of growth. Considering these factors, Dallas Executive Airport should be able to increase its market share in the future. The selected planning forecast most closely follows the constant ratio projection for service area employment and the increasing market share of the active general aviation aircraft fleet. As detailed, the selected based aircraft forecast considers 200 aircraft based at the airport by 2016, 215 aircraft by 2021, and 245 aircraft by 2031. This equates to a 1.4 percent AAGR through the 20-year planning period.

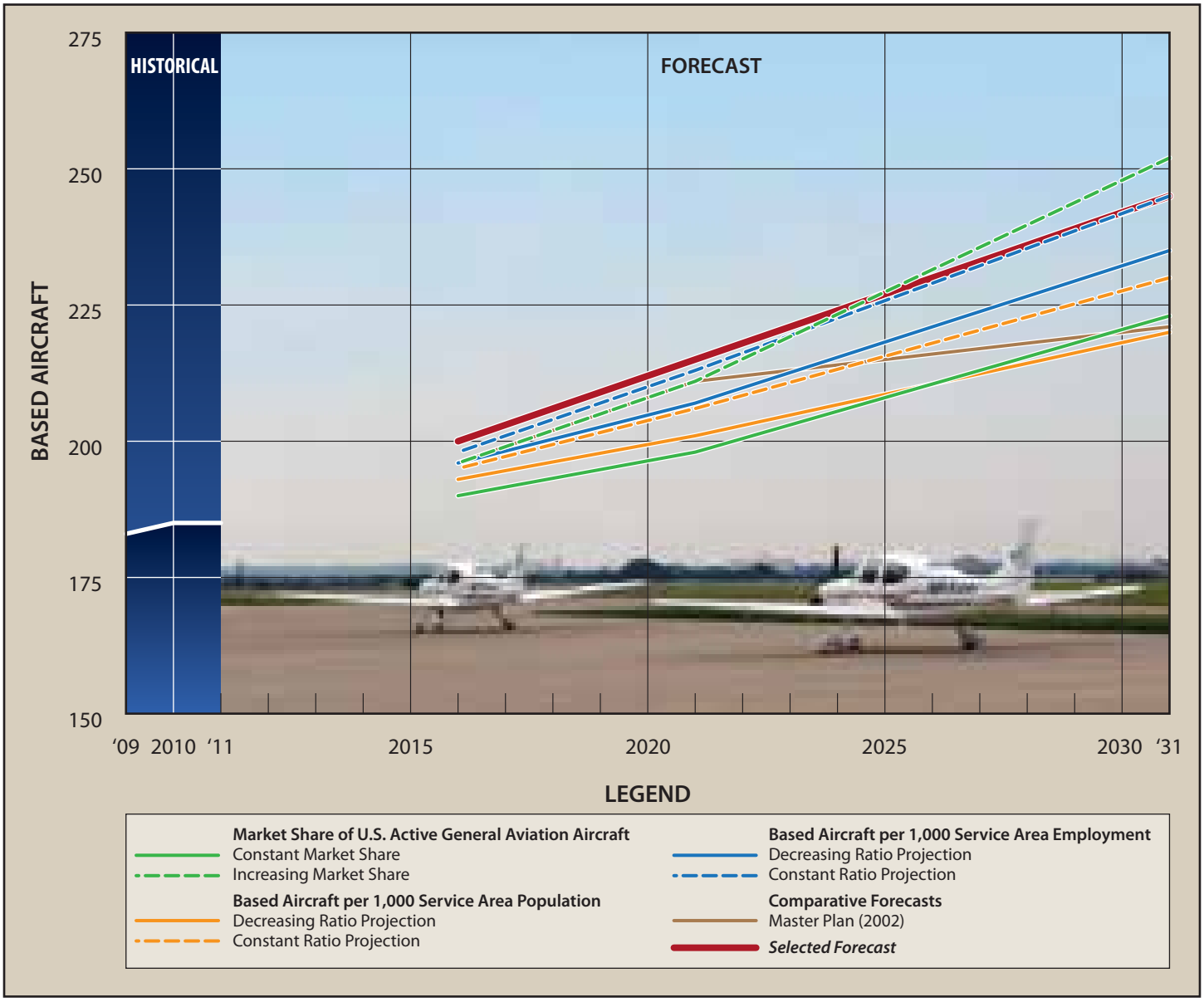
BASED AIRCRAFT FLEET MIX

Knowing the aircraft fleet mix expected to utilize Dallas Executive Airport is necessary to properly plan for facilities that will best serve the level of activity and the type of activities occurring at the airport. The existing based aircraft fleet mix is comprised of 143 single engine piston aircraft, 12 multi-engine piston aircraft, nine turboprop aircraft, 15 jet aircraft, and six rotorcraft.

Table 2F: BASED AIRCRAFT FORECAST SUMMARY

Projections	2016	2021	2031
Market Share of U.S. Active General Aviation Aircraft			
Constant Market Share (0.94% AAGR)	190	198	223
Increasing Market Share (1.56% AAGR)	196	211	252
Based Aircraft per 1,000 Service Area Population			
Decreasing Ratio Projection (0.87% AAGR)	193	201	220
Constant Ratio Projection (1.09% AAGR)	195	206	230
Based Aircraft per 1,000 Service Area Employment			
Decreasing Ratio Projection (1.20% AAGR)	196	207	235
Constant Ratio Projection (1.41% AAGR)	198	213	245
Comparative Forecasts			
Master Plan (2002) (0.89% AAGR)	196	211	221
Selected Forecast (1.41% AAGR)	***200***	***215***	***245***

Exhibit 2C: BASED AIRCRAFT FORECAST SUMMARY



As detailed previously, the national trend is toward a larger percentage of sophisticated turboprop aircraft, jet aircraft, and helicopters in the national fleet. Active multi-engine piston aircraft are expected to be the only category of aircraft which shows a decrease in annual growth due to the retirement of aged aircraft in this category. 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 conditions.

Based in part on national and local fleet mix data, a forecast of the future based aircraft fleet mix at Dallas Executive Airport has been made. As presented in **Table 2G**, single engine piston-powered aircraft will continue to account for the largest share of based aircraft at the airport. Over the course of the 20-year planning period, jets are forecast to experience the largest growth as a percentage of total based aircraft. In addition, turboprops and rotorcraft are projected to increase significantly. Single and multi-engine piston-powered aircraft are forecast to drop as a percentage of the fleet mix, although both categories are projected to increase overall.

Table 2G: BASED AIRCRAFT FLEET MIX

Aircraft Type	2011	Percentage	2016	Percentage	2021	Percentage	2031	Percentage
Single Engine Piston	143	77.30%	151	75.50%	159	73.95%	175	71.43%
Multi-Engine Piston	12	6.49%	13	6.50%	13	6.05%	14	5.71%
Turboprop	9	4.86%	11	5.50%	13	6.05%	17	6.94%
Jet	15	8.11%	18	9.00%	21	9.77%	29	11.84%
Helicopters	6	3.24%	7	3.50%	9	4.19%	10	4.08%
Total	**185**	**100.00%**	**200**	**100.00%**	**215**	**100.00%**	**245**	**100.00%**

Source: Airport Records; Coffman Associates analysis

ANNUAL AIRCRAFT OPERATIONS

General aviation operations are classified by the airport traffic control tower (ATCT) as either local or 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.

Airport operations can be further broken down into distinct groups. For airports such as Dallas Executive, operations typically include general aviation, air taxi, and military. General aviation operations are those conducted by private individuals or companies not flying commercially. Air taxi refers to those operators that are certified in accordance with Federal Aviation Regulation (F.A.R.) Part 135 and are authorized to provide on-demand public transportation of persons and property by aircraft. Military operations are those conducted by military personnel and aircraft.

Table 2H depicts the history of all aircraft operations at Dallas Executive Airport since 2000, as counted by the ATCT. Itinerant operations have fluctuated during the timeframe, but have generally been on the decrease in recent years. In 2007, the airport experienced 39,442 itinerant operations, which represents the highest count for a calendar year since 2000. The lowest count was experienced this past year in 2010, as the ATCT logged 23,561 itinerant operations. Local operations have also fluctuated at the airport since 2000. Similar to itinerant operations, 2007 marked the highest number of local operations at 107,128. Since this

Table 2H: HISTORICAL AIRCRAFT OPERATIONS

	Itinerant					Local			
Year	Air Carrier	Air Taxi	General Aviation	Military	Total	General Aviation	Military	Total	Total Operations
2000	0	1	32,700	224	32,925	71,431	302	71,733	**104,658**
2001	0	52	32,476	182	32,710	69,327	190	69,517	**102,227**
2002	0	29	34,371	198	34,598	60,164	196	60,360	**94,958**
2003	0	20	31,745	118	31,883	58,839	181	59,020	**90,903**
2004	0	4	31,097	101	31,202	62,359	220	62,579	**93,781**
2005	0	13	28,829	75	28,917	53,566	144	53,710	**82,627**
2006	0	39	32,026	121	32,186	102,259	182	102,441	**134,627**
2007	0	89	39,234	119	39,442	106,976	152	107,128	**146,570**
2008	10	133	30,322	137	30,602	64,539	231	64,770	**95,372**
2009	2	19	26,249	156	26,426	41,204	552	41,756	**68,182**
2010	2	147	23,175	237	23,561	30,480	210	30,690	**54,251**

Source: Air Traffic Activity System (ATADS)

time, local operations have decreased annually to a low of 30,690 operations in 2010. This can be attributed to a major decrease in the number of flight training operations at the airport. These operational statistics are the actual ATCT counts conducted when the tower is open and do not reflect operations that occur while the tower is closed. An industry standard three percent adjustment will be added to the final operations forecast to account for operations that occur when the tower is closed.

Dallas Executive Airport has realized approximately 65 percent of the total operations as local and 35 percent as itinerant since 2000. This is typical of an airport with significant flight training activity. It should be noted that in recent years, the percentage of itinerant operations as it relates to total aircraft activity has increased. In 2010, the percentage split was 57 percent and 43 percent for local and itinerant operations, respectively.

General Aviation Itinerant Operations

Table 2J outlines itinerant general aviation operations for the year 2010 in relation to the total general aviation itinerant operations at towered airports in the United States. The Dallas Executive Airport market share, as a percentage of general aviation itinerant operations at towered airports across the country, was 0.16 percent. The table also indicates that there were 125 itinerant operations per based aircraft in 2010.

Four projections based upon market share of the total U.S. towered traffic and ratio of operations per based aircraft are presented in **Table 2J**.

Table 2J: GENERAL AVIATION ITINERANT OPERATIONS FORECAST

Year	GA Itinerant Operations	U.S. GA Itinerant Operations	Market Share Itinerant Operations	Based Aircraft	Itinerant Operations per Based Aircraft
2010	23,175	14,859,900	0.16%	185	125
Constant Market Share of Total Itinerant Operations					
2016	24,410	15,256,400	0.16%	200	122
2021	25,961	16,225,800	0.16%	215	121
2031	29,428	18,392,300	0.16%	245	120
Increasing Market Share of Total Itinerant Operations					
2016	28,987	15,256,400	0.19%	200	145
2021	35,697	16,225,800	0.22%	215	166
2031	47,820	18,392,300	0.26%	245	195
Constant Operations per Based Aircraft					
2016	25,000	15,256,400	0.16%	200	125
2021	26,875	16,225,800	0.17%	215	125
2031	30,625	18,392,300	0.17%	245	125
Increasing Operations per Based Aircraft					
2016	27,000	15,256,400	0.18%	200	135
2021	31,175	16,225,800	0.19%	215	145
2031	39,200	18,392,300	0.21%	245	160
FAA TAF Projections					
2016	23,939	15,256,400	0.16%	200	120
2021	25,725	16,225,800	0.16%	215	120
2031	29,657	18,392,300	0.16%	245	121
Selected Forecast					
2016	27,000	15,256,400	0.18%	200	135
2021	32,000	16,225,800	0.20%	215	149
2031	40,000	18,392,300	0.22%	245	163

Source: FAA Aerospace Forecasts FY 2011-2031; Coffman Associates analysis

With the first, a constant market share projection would result in a slight decrease in operations per based aircraft, from 122 in 2016 to 120 in 2031. The second projection calls for an increasing market share, similar to what was experienced at the airport back in the mid-2000s when itinerant operations were annually increasing. A constant and increasing operations per based aircraft forecast was also determined for itinerant activity.

For comparison, the FAA TAF projections are presented in the table. With this forecast, the market share remains static during the 20-year timeframe, and the ratio of operations per based aircraft only increases by one aircraft.

While general aviation itinerant operations have decreased annually the past few years, the selected forecast shows a return to positive growth. An improving economy and continued

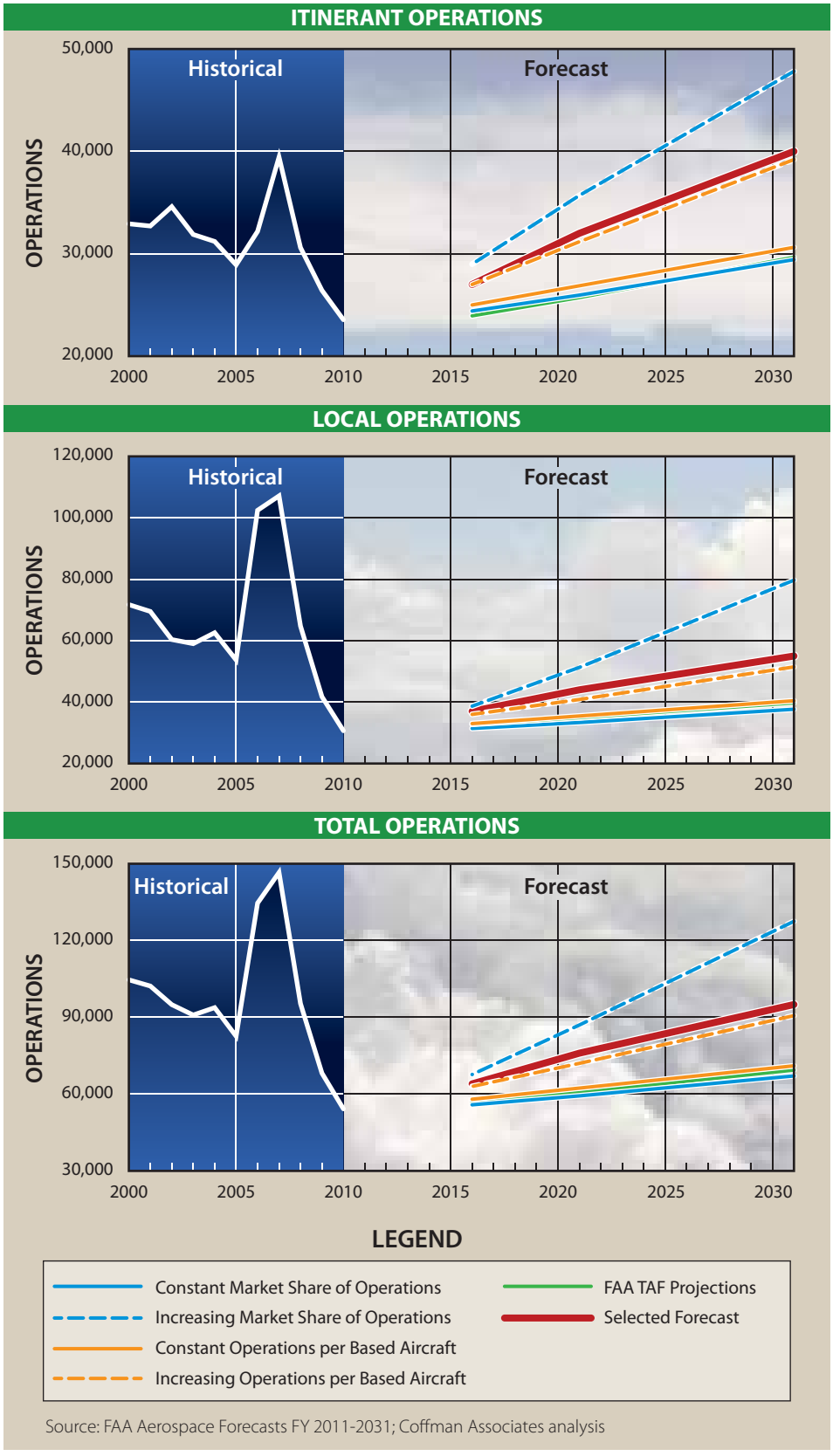
development potential in the region that further supports aviation activity can attribute to this. The selected forecast for itinerant operations at Dallas Executive Airport would account for both increased aircraft utilization per based aircraft and increased market share as a percentage of total U.S. itinerant operations. The selected forecast equates to an AAGR of 2.63 percent through the planning period. **Exhibit 2D** further presents the general aviation itinerant operations forecasts.

General Aviation Local Operations

Table 2K outlines local general aviation operations in relation to the total general aviation local operations at towered airports in the United States. The Dallas Executive Airport market, as a percentage of total general aviation local operations at towered airports, was 0.26 percent in 2009. It should be noted that back in 2006 and 2007, the airport's market share was as high as 0.75 percent. This percentage was a result of significant flight training activity being conducted at the airport. In 2010, the ratio of local operations per based aircraft was 165.

As presented in the table, projections similar to what were made for itinerant operations at Dallas Executive Airport are depicted. The first forecast considers maintaining a constant 0.26 percent market share of national local operations. A second forecast was completed that increases the market share to levels that were experienced at the airport approximately five years ago, yielding a local annual operations projection of approximately 80,000 by 2031. Forecasts for constant and increasing operations per based aircraft were also performed. The increasing operations per based aircraft would

Exhibit 2D: GENERAL AVIATION OPERATIONS FORECAST



Source: FAA Aerospace Forecasts FY 2011-2031; Coffman Associates analysis

indicate a return to higher levels of flight training activity, such as what was experienced back in the mid-2000s.

The FAA TAF projections are also presented in the table. Similar to itinerant operations, the FAA TAF projections show no increase in market share. Furthermore, the ratio of local operations per based aircraft slightly decreases.

The selected forecast for local general aviation operations at Dallas Executive Airport is depicted on **Exhibit 2D** and at the bottom of **Table 2K**. Local general aviation operations are projected to increase through the planning period, at 2.85 percent annually, following forecast healthy gains in the economy and in total local general aviation operations per the *FAA Aerospace Forecasts – Fiscal Years 2011-2031*. The level of local activity will continue to be dependent upon the operations of flight training, as well as aircraft basing at the airport.

Table 2K: GENERAL AVIATION LOCAL OPERATIONS FORECAST

Year	GA Local Operations	U.S. GA Local Operations	Market Share Local Operations	Based Aircraft	Local Operations Per Based Aircraft
2010	30,480	11,711,500	0.26%	185	165
Constant Market Share of Total Local Operations					
2016	31,422	12,085,500	0.26%	200	154
2021	33,348	12,826,000	0.26%	215	152
2031	37,671	14,489,000	0.26%	245	149
Increasing Market Share of Total Local Operations					
2016	38,674	12,085,500	0.32%	200	193
2021	51,304	12,826,000	0.40%	215	239
2031	79,690	14,489,000	0.55%	245	325
Constant Operations per Based Aircraft					
2016	33,000	12,085,500	0.27%	200	165
2021	35,475	12,826,000	0.28%	215	165
2031	40,425	14,489,000	0.28%	245	165
Increasing Operations per Based Aircraft					
2016	36,000	12,085,500	0.30%	200	180
2021	40,850	12,826,000	0.32%	215	190
2031	51,450	14,489,000	0.36%	245	210
FAA TAF Projections					
2016	32,782	12,085,500	0.27%	200	164
2021	34,953	12,826,000	0.27%	215	163
2031	39,745	14,489,000	0.27%	245	162
Selected Forecast					
2016	37,000	12,085,500	0.31%	200	185
2021	44,000	12,826,000	0.34%	215	205
2031	55,000	14,489,000	0.38%	245	224

Source: FAA Aerospace Forecasts FY 2011-2031; Coffman Associates analysis

Air Taxi Operations

The air taxi category includes aircraft involved in on-demand passenger, small parcel transport, and air ambulance activity. The history of air taxi operations at Dallas Executive Airport was previously presented on **Table 2H**. Since 2000, air taxi operations have averaged only 50 per year. The FAA TAF projects air taxi activity to remain level at 39 annual operations through the planning period.

Many general aviation airports have experienced increases in air taxi activity in previous years. This can be primarily attributed to the increased popularity of on-demand air travel for time savings and due to scheduled airline security procedures. In 2009, however, total air taxi operations dipped to their lowest in several years, due mainly to the economic downturn currently being experienced. After a short decline, the FAA forecasts modest growth in total air taxi operations in the United States through 2031.

The historic up-and-down air taxi activity at Dallas Executive Airport over the previous several 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.

Air taxi operations have been forecast to increase through the planning period, reaching 2,000 annually by 2031. This operational level is conducive of a reliever airport surrounded by a variety

of industrial and commercial business activities as currently exists, and is forecast to continue for areas adjacent to Dallas Executive Airport.

Military Operations

Table 2H presents the history of military operations at Dallas Executive Airport since 2000. Over that time period, military operations have averaged approximately 400 annually. Of these operations, approximately 60 percent were local and 40 percent were itinerant.

Forecasting for military activity is particularly challenging when there are no based aircraft. In addition, the mission of the military can change rapidly, affecting the potential for military activity. Due to this unpredictability, military activity is forecast as a constant of 500 total operations annually for each planning period. This constant is approximately an average of the activity experienced since 2000.

Operations Adjustment and Summary

Since the Dallas Executive 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 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 Dallas Executive ATCT currently operates from 7:00 a.m. to 9:00 p.m. daily. For planning purposes, operations after the tower has closed are estimated at three percent of total operations. This estimate is based on experience at other airports where after hours operational counts have been conducted.

Total operations for Dallas Executive Airport have been forecast through 2031. A number of sources have been consulted for this forecast analysis. **Exhibit 2E** presents a summary of forecast annual operations at Dallas Executive Airport. As can be seen from the table, total annual operations for Dallas Executive Airport are forecast to increase to 100,400 by 2031. This equates to a 2.83 percent AAGR.

Peaking Characteristics

Many airport facility needs are related to the levels of activity during peak periods (busy times). The periods used in developing facility requirements for this study are as follows:

- **Peak Month** – The calendar month when peak aircraft operations occur.
- **Design Day** – The average day in the peak month. This indicator is derived by dividing the peak month operations by the number of days in the month.
- **Busy Day** – The busy day of a typical week in the peak month.
- **Design Hour** – The peak hour within the design day.

The peak month is an absolute peak within a given year. All other peak periods will be exceeded at various times during the year. However, they do represent reasonable planning standards that can be applied without overbuilding or being too restrictive. The peak periods forecast has been determined utilizing operations reports by the Dallas Executive ATCT to the FAA. The peak month at Dallas Executive Airport has historically occurred during the spring and summer months. During the past five years, the peak month average has accounted for 10.5 percent of the annual operations. The design day operations were calculated by dividing the peak month by the number of days in a month (30).

Daily operational counts from the ATCT were utilized to determine a busy day peaking factor for general aviation activity. The peak day of each week has historically averaged 20 percent of weekly operations. Thus, to determine the typical busy day, the design day is multiplied by 1.40, which represents 20 percent of the days in a week (7 x 0.20). Design hour operations were determined to be approximately 15 percent of the design day operations. The peaking characteristics are summarized in **Exhibit 2E** for each planning year period.

Annual Instrument Approaches

An instrument approach, as defined by the FAA, is "an approach to an airport with the intent to land by an aircraft in accordance with an Instrument Flight Rule (IFR) flight plan, when visibility is less than three miles and/or when the ceiling is at or below the minimum initial approach altitude." To qualify as an instrument approach, aircraft must land at the airport after following one of the published instrument approach procedures in less than visual conditions. Forecasts of annual instrument approaches (AIAs) provide guidance in determining an airport's requirements for navigational aid facilities such as an ILS. It should be noted that practice or training approaches do not count as annual AIAs.

During poor weather conditions, pilots are less likely to fly and rarely would perform training operations. As a result, an estimate of the total number of AIAs

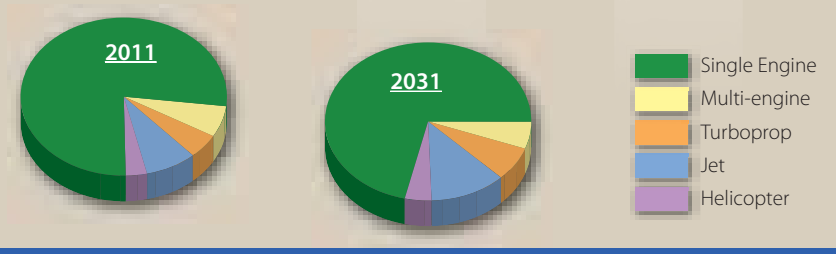
can be made based on a percent of itinerant operations, regardless of the frequency of poor weather conditions. In the future, Dallas Executive Airport will be increasingly utilized by larger and more sophisticated aircraft. Also, the increased availability of low-cost navigational equipment could allow for smaller and less sophisticated aircraft to utilize instrument approaches. National trends indicate an increasing percentage of instrument approaches given the greater availability of approaches at airports with global positioning systems (GPS) and the availability of more cost-effective equipment. AIA projections are presented on **Exhibit 2E**. The projection considers AIAs totaling three percent of all itinerant operations through 2031.

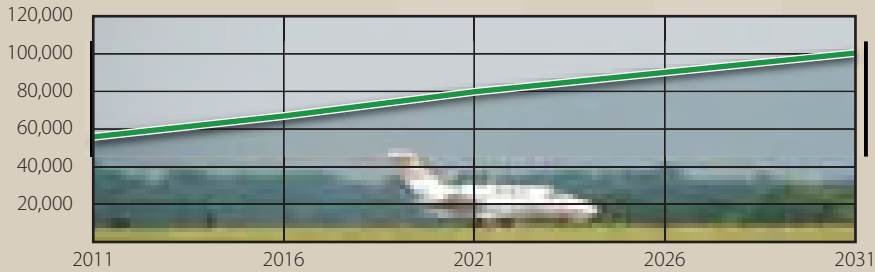
AGGRESSIVE GROWTH FORECAST MODEL

The forecasts prepared in the previous sections were developed utilizing FAA forecasting criteria for Airport Master Plan studies. The analysis utilized historic trends and industry-standard modeling techniques. It is important to note that the FAA and TxDOT must approve Master Plan forecasts in order that those forecasts can be utilized for the basis of airport planning. As noted at the beginning of the chapter, the FAA mandates that the forecasts be reasonable. Reasonableness is typically identified by the FAA as forecasts which have a basis in recent aviation activity trends at the airport. The forecasts presented in the previous sections meet the FAA's standard of reasonable as they are in line with recent trends on both the local and national levels. Thus, these forecasts will serve as a basis for the Master Plan recommendations to follow.

Exhibit 2E: FORECAST SUMMARY (Master Plan)

	Base Year	2016	2021	2031
BASED AIRCRAFT				
Single Engine Piston	143	151	159	175
Multi-Engine Piston	12	13	13	14
Turboprop	9	11	13	17
Jet	15	18	21	29
Helicopters	6	7	9	10
Total Based Aircraft	**185**	**200**	**215**	**245**
ANNUAL OPERATIONS				
General Aviation				
Itinerant	23,175	27,000	32,000	40,000
Local	30,480	37,000	44,000	55,000
Air Taxi	147	500	1,000	2,000
Military				
Itinerant	237	200	200	200
Local	210	300	300	300
Totals				
Total Itinerant	23,559	27,700	33,200	42,200
Total Local	30,690	37,300	44,300	55,300
ATCT After-hours 3% Adjustment	1,627	1,950	2,325	2,925
Total Operations*	**55,876**	**67,000**	**79,800**	**100,400**
PEAK PERIOD OPERATIONS				
Peak Month	5,867	7,035	8,379	10,542
Busy Day	274	328	371	443
Design Day	196	235	279	351
Design Hour	29	35	42	53
ANNUAL INSTRUMENT APPROACHES				
	N/A	830	1,000	1,270





* Forecast operations totals are rounded to nearest 100

The Master Plan process also allows the airport sponsor to consider greater opportunities based on local conditions that could possibly outpace recent trends. For Dallas Executive Airport, significant investment exceeding $20 million has been made in landside facilities by private entities. The City of Dallas has also invested millions of dollars into the construction of a new terminal building complex and the extension of utility infrastructure to vacant land on the west side of the airport. These public and private entities have indicated that they will continue to aggressively promote and develop the airport.

While the approach of "if you build it, they will come" is not a sound planning practice, the approach can be effective in large metropolitan areas. If abundant space is provided at market rates, some aviation demand can be attracted from other regional airports that are nearing capacity and are too busy or congested. Moreover, Dallas Executive Airport is the best positioned in the region to serve those who desire quick access to downtown Dallas. For these reasons, an aggressive growth forecast model has been developed.

The aggressive growth model cannot be utilized for the basis of this study; however, it can serve to guide local decision makers and airport administration in the event that aviation demand outpaces the Master Plan projections. It will allow the ultimate development plan to be reflective of growth beyond the scope of the demand needs tied to the moderate Master Plan forecasts. It is important to note that forecasting is a process which utilizes both analytical and judgmental inputs. Very rarely will any forecast be accurate as aviation demand typically follows more of a "stair-step" growth curve rather than a straight-line. The stair-step is typical of periods when facility development attracts demand then the growth slows or stagnates until additional development occurs.

Exhibit 2F presents the aggressive growth forecast model prepared for Dallas Executive Airport. The model considers based aircraft growth to be at three percent annually, which is approximately twice the rate of the Master Plan forecast. This projection yields 335 based aircraft at the airport by 2031. The aggressive growth forecast model also considers the same trends utilized in developing the Master Plan forecasts for aircraft fleet mix, general aviation operations (both local and itinerant), operational peak periods, and annual instrument approaches. It was believed that both air taxi and military operations would remain in the same planning envelope under the aggressive growth model as they would be unaffected by a higher number of aircraft basing at the airport.

It is important that the airport sponsor be sensitive to the quality of based aircraft and their operations rather than the quantity of demand in aggregate. One of the most important aspects of airport planning is the type of aircraft utilizing the airport and the number of operations it regularly conducts. For example, if an airport is home to only single-engine piston aircraft, the airport facilities required to meet this demand are relatively minor, including relatively short runways, fewer taxiways, narrower pavement surfaces, smaller apron spaces, and fewer large-span hangar facilities. If, however, larger aircraft operate at the airport frequently, it is these aircraft that will define the range of facilities. These aircraft typically require longer runway lengths, more taxiway options, additional pavement areas for aircraft movements and parking, larger hangars, etc.

The totals presented in the Master Plan forecast may be considered "low" in aggregate but could have a

larger "quality" in that more business jets could elect to base at the airport than projected. In this event, facilities required to meet such an occurrence would be needed. Therefore, while the remainder of this Master Plan will utilize the projections presented in the previous sections, the aggressive growth figures will be considered for ultimate facility planning. As will be noted in following chapters, specific justification will be required for improvements needing federal or state funding assistance. Thus, the forecasts only serve as a guide while actual demand levels will dictate investment decisions.

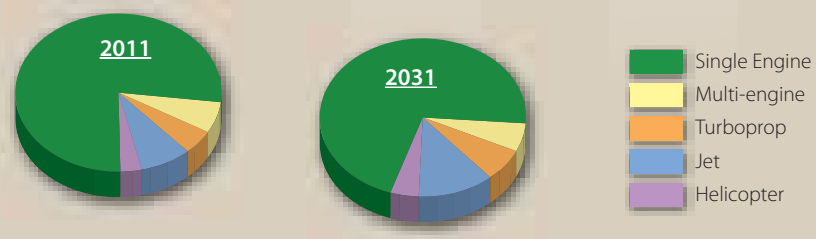
SUMMARY

This chapter has provided demand-based forecasts of aviation activity at Dallas Executive Airport over the next 20 years, broken down into five-year intervals. Elements such as local socioeconomic indicators, anticipated regional development, and historical aviation data as well as national aviation trends were all considered when determining future conditions.

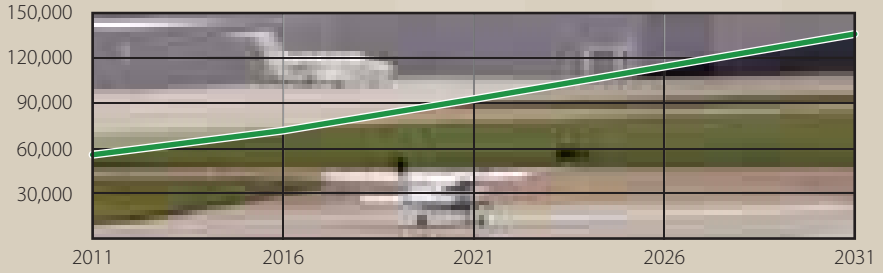
The next step in the master planning process will be to assess the capacity of existing facilities, their ability to meet forecast demand, and to identify changes to the airside and/or landside facilities which will create a more functional aviation facility. A summary of aviation forecasts utilized for the Master Plan is depicted on **Exhibit 2E**.

Exhibit 2F: AGGRESSIVE GROWTH FORECAST MODEL (for local use)

	Base Year	2016	2021	2031
BASED AIRCRAFT				
Single Engine Piston	143	162	185	239
Multi-Engine Piston	12	14	15	19
Turboprop	9	12	16	23
Jet	15	19	24	40
Helicopters	6	8	10	14
Total Based Aircraft	**185**	**215**	**250**	**335**



ANNUAL OPERATIONS				
General Aviation				
Itinerant	23,175	29,000	37,300	54,600
Local	30,480	39,800	51,300	75,000
Air Taxi	147	500	1,000	2,000
Military				
Itinerant	237	200	200	200
Local	210	300	300	300
Totals				
Total Itinerant	23,559	29,700	38,500	56,800
Total Local	30,690	40,100	51,600	75,300
ATCT After-hours 3% Adjustment	1,627	2,094	2,703	3,963
Total Operations*	**55,876**	**71,900**	**92,800**	**136,100**



PEAK PERIOD OPERATIONS				
Peak Month	5,867	7,549	9,744	14,287
Busy Day	274	352	455	667
Design Day	196	252	325	476
Design Hour	29	38	49	71
ANNUAL INSTRUMENT APPROACHES				
	N/A	1,200	1,550	2,260

* Forecast operations totals are rounded to nearest 100