Central Texas Airport – Phase 1
Feasibility Study

Wilbur Smith Associates

Prepared For:

Texas Department of Transportation
Aviation Division

Central Texas Airport

FEASIBILITY STUDY

Prepared for:

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Prepared by:

Wilbur Smith Associates, Inc.

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TABLE OF CONTENTS

EXECUTIVE SUMMARY

CHAPTER ONE – PROJECT INTRODUCTION

CHAPTER TWO – INVENTORY OF EXISTING CONDITIONS

CHAPTER THREE – STUDY AREA CHARACTERISTICS

CHAPTER FOUR – NATIONAL AND STATE AVIATION TRENDS

CHAPTER FIVE – REGIONAL PROJECTIONS OF DEMAND

CHAPTER SIX – IMPLICATIONS OF REGIONAL DEMAND PROJECTIONS

CHAPTER SEVEN – FACILITY TEMPLATE

CHAPTER EIGHT – PRELIMINARY COST ESTIMATES

CHAPTER NINE – FINANCIAL FEASIBILITY

LIST OF TABLES

CHAPTER TWO – INVENTORY OF EXISTING CONDITIONS

CHAPTER THREE – STUDY AREA CHARACTERISTICS

CHAPTER FOUR – NATIONAL AND STATE AVIATION TRENDS

CHAPTER FIVE – REGIONAL PROJECTIONS OF DEMAND

CHAPTER SIX – IMPLICATIONS OF REGIONAL DEMAND PROJECTIONS

CHAPTER SEVEN – FACILITY TEMPLATE

CHAPTER EIGHT – PRELIMINARY COST ESTIMATES

LIST OF EXHIBITS

CHAPTER ONE – PROJECT INTRODUCTION

CHAPTER TWO – INVENTORY OF EXISTING CONDITIONS

CHAPTER THREE – STUDY AREA CHARACTERISTICS

CHAPTER FOUR – NATIONAL AND STATE AVIATION TRENDS

CHAPTER SIX – IMPLICATIONS OF REGIONAL DEMAND PROJECTIONS

CHAPTER SEVEN – FACILITY TEMPLATE

CHAPTER NINE – FINANCIAL FEASIBILITY

EXECUTIVE SUMMARY

Background

The Texas Department of Transportation (TxDOT), Aviation Division, received a Federal Aviation Administration (FAA) grant to study the feasibility of, and determine the best location for, a new general aviation airport in the Austin area. The study is the result of a State Legislature mandate. The recent closures of Robert Mueller Municipal and Austin Executive have significantly reduced the options available to area aircraft owners and transient general aviation users alike. The general area being considered for the siting of a new airport is Travis County and the six contiguous counties.

This report is the first of a four-part process that may include a feasibility analysis, site selection study, airport master plan, and an environmental assessment. In addition to review from TxDOT, a Technical Advisory Committee, consisting of various public and private agencies and groups, provided guidance and review of the analysis. The study's four phases are anticipated to take at least 18 months to complete.

Findings

The findings from this study indicate that there is a strong demand for a new general aviation airport in the seven county market area. Over the last 10 years, the market area has experienced very strong economic and population growth. The seven county area has added more than 300 additional based aircraft. Since 1995, general aviation operations have increased by more than 170,000. Conservative projections indicate that the study area has the potential to experience a significant growth in general aviation activity over the next 20-years; an additional 580 based aircraft and more than 270,000 additional general aviation operations.

While this demand will undoubtedly be spread throughout the study area, existing and future demographic trends dictate that most of the demand for aviation services will be proximate to the I-35 corridor in Travis and Williamson counties. An analysis of population, business locations, and current aircraft owners support the importance of this corridor.

With most of the projected growth for the area anticipated in northern Travis County and Williamson County, there is currently no business class airport available to accommodate the growing level of aviation demand that this area will generate. Georgetown Municipal reportedly has limited, if any, expansion potential and is already operating at nearly 90 percent of its capacity. While Austin-Bergstrom International has available capacity and landside expansion potential, its primary focus will be on commercial service activities. In addition, increasing congestion on I-35 and other major thoroughfares may limit the attractiveness of Austin-Bergstrom International Airport to general aviation users located in the northern potion of the service area. San Marcos Municipal is an excellent facility, however, its location will primarily serve the southern portion of the market area.

Based on the above conclusions, a new general aviation airport appears warranted if a location that serves the primary demand corridor (I-35/SH-360) through the study area can be identified. The high growth northern portion of the study area is currently underserved and may present the best opportunity from a “proximity to demand” standpoint. Additional considerations, such as available land, environmental impacts, etc. will have to be considered before any final conclusions can be drawn.

A new general aviation airport should provide a single runway with an ultimate runway length of approximately 7,000 feet, designed to accommodate business jet aircraft. The ideal airport site will be more than two miles in length (to accommodate FAA required safety areas) and could require 800 acres or more.

There is a strong potential for a new general aviation airport in the Central Texas region to operate in a financially self-sufficient manner during the 20-year planning period.

Next Steps

Phase II of the study will review suggested sites as well as identify other potential locations. This phase of the analysis will identify the most suitable location available for a new general aviation airport in the Study Area. If a suitable site is identified, a site specific airport master plan and environmental assessment will be initiated.

CHAPTER ONE
PROJECT INTRODUCTION

The Central Texas area, comprised of Travis County and the six contiguous counties, is home to a growing, diverse economy. **Exhibit 1-1** depicts Central Texas, the area being evaluated by this analysis. The thriving economic base, coupled with a strong tourism/recreation market, supports significant amounts of commercial passenger and general aviation activity. With the closure of Austin Executive Airpark and Robert Mueller Municipal Airport, the options for based general aviation aircraft owners and transient pilots were greatly limited in the Austin area. Today, much of the general aviation traffic is accommodated at Austin-Bergstrom International. As the commercial traffic continues to increase at Austin-Bergstrom International Airport, a reliever airport that can accommodate the area's growing demand for general aviation, and divert that general aviation traffic from the busier commercial service airport, becomes more critical to the aviation system of Central Texas.

House Bill 2522 gave TxDOT the power to establish and maintain a general aviation airport in Central Texas. The primary goal of the Central Texas Airport Site Selection Study is to quantify demand for a new general aviation airport in Central Texas. If sufficient demand is documented, the project will then review and identify a potential site for an airport that meets the changing demands of the region's general aviation community, promotes economic development, is politically feasible, has limited environmental impacts or impacts that can be mitigated, and is located proximate to the demand.

The Central Texas Airport Site Selection Study includes the following four components:

- Feasibility Study
- Site Selection Study
- Master Plan
- Environmental Assessment

It is important to note that each study component is contingent on the outcome of the prior component. For example, the Site Selection Study will not be initiated unless the Feasibility Study concludes that the establishment of a new general aviation airport in Central Texas is feasible.

The first phase of the analysis, the Feasibility Study, will identify potential regional demand for a new general aviation airport and also identify a facility template based on the needs of the region's aviation users. Contingent upon the findings of the Feasibility Study, the Site Selection Study would identify the most suitable site in the region for the proposed facility in a manner that is defendable to the various Federal, State, and regional review agencies and the public. The Master Plan, if initiated, will identify required facilities for the new general aviation airport and determine the most efficient layout given the selected site. Finally, the Environmental Assessment would use National Environmental Protection Act (NEPA) and Federal Aviation Administration (FAA) guidelines to identify potential environmental impacts, if any, of the new general aviation airport and determine the most suitable way to avoid, minimize, or mitigate the impacts as necessary.

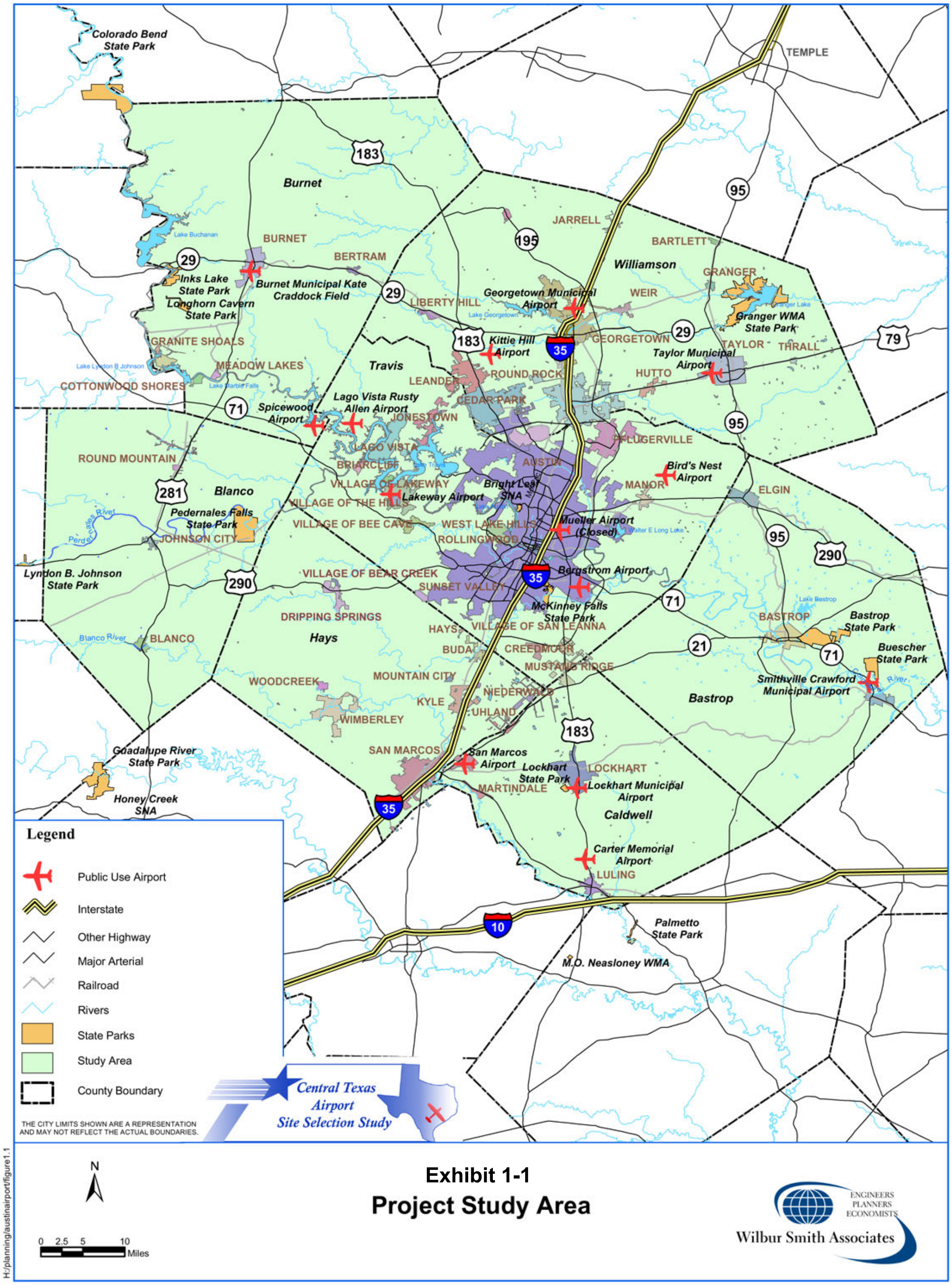

Exhibit 1-1

Project Study Area

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ENGINEERS PLANNERS ECONOMISTS

The Feasibility Study includes the following components:

- Study Background
- Inventory of Existing Conditions
- Study Area Characteristics
- National and State Aviation Trends
- Regional Projections of Demand
- Implications of Regional Demand Projections
- Facility Template
- Preliminary Cost Estimate
- Financial Feasibility

A brief examination of the recent, dynamic history of aviation activity in the Central Texas area will provide the foundation from which the Feasibility Study, as well as the other study components, can proceed.

Study Background

The Central Texas region experienced rapid expansion during the 1990's. Significant population growth was experienced and the area's economy was transformed into a service and technology based economy with local industries and businesses that participated and competed on a global scale. Access to aviation facilities and services is one factor that surely fostered this growth. In this dynamic period, however, aviation in Central Texas was impacted by a number of factors including rapid population growth and commercial/residential development; increased demand for aviation facilities and services; the construction of Austin-Bergstrom Airport, a new commercial service facility in southern Austin; and the closures of two airports providing general aviation access, Robert Mueller Municipal Airport and Austin Executive Airpark in central and northern Travis County.

As a result of these major changes occurring to the study area, many general aviation airports were impacted in and around Austin as general aviation aircraft based at Robert Mueller Municipal Airport and Austin Executive Airpark were forced to relocate. Interested parties including TxDOT, the City of Pflugerville, and the Texas Legislature have all examined general aviation in Central Texas and agreed that actions may need to be taken in the area to ensure that the area contains adequate general aviation airport facilities to accommodate existing and future levels and types of general aviation activity.

Background information regarding factors that have impacted general aviation in the study area is presented in the following sections:

- Recent Airport Closures
- Pflugerville Study
- House Bill 2522
- Conclusion

By examining recent trends affecting general aviation airports in the study area, previous studies conducted in the study area, and the legislation that mandated this study, a foundation for the analysis can be established. The factors identified above will undoubtedly impact the options and outputs of this study.

Recent Airport Closures

Prior to the construction of Austin-Bergstrom International Airport, aviation activity in and around the City of Austin was supported by Robert Mueller Municipal Airport and Austin Executive Airpark. Robert Mueller Municipal Airport, located in the City of Austin, accommodated scheduled commercial passenger activity as well as operations by general aviation aircraft. Austin Executive Airpark, also located in the City of Austin, exclusively supported general aviation operations. These two airports, however, closed during the late 1990s for different reasons and since then, Austin's aviation landscape has been significantly impacted.

Robert Mueller Municipal Airport

Robert Mueller Municipal Airport closed to air traffic on May 23, 1999, the same day that Austin-Bergstrom International officially opened and began accommodating Austin's commercial service and general aviation activity. Austin-Bergstrom International Airport had traditionally been a military-use facility. In the early 1990s, during a period of Department of Defense base closures, the City worked with the military to take over the former Bergstrom Air Force Base and move aviation activity from Mueller to the former air force base located seven miles to the south of Robert Mueller Municipal Airport. Austin residents voted in 1993 to convert the former air force base into the City's public-use airport. Renamed Austin-Bergstrom International Airport, the facility was planned to accommodate both commercial passenger and general aviation activity. A key contingent in the popular vote was the mandate that in conjunction with opening Austin-Bergstrom International Airport, Robert Mueller Municipal Airport must be closed to aviation activity.

The transfer of scheduled passenger activity from Robert Mueller Municipal Airport to Austin-Bergstrom International Airport represented a significant facility upgrade for the Central Texas region. Future development at Robert Mueller Municipal Airport was constrained, since the airport operated with only a 7,000-foot long runway and 16 passenger gates in the commercial passenger terminal. At Austin-Bergstrom International Airport, air carriers operated on a 12,250-foot long runway in a terminal with 25 gates and 600,000 square feet of space. The new terminal was designed to accommodate expansion to a total of 55 gates. Robert Mueller Municipal Airport had a land area of approximately 711 acres, which was surrounded by residential development. Austin-Bergstrom International Airport totaled approximately 4,200 acres and provided significant expansion potential.

While the relocation of aviation activity to Austin-Bergstrom International Airport may have significantly benefited commercial passenger activity in the Austin region, general aviation activity was forced to relocate further from downtown Austin, a primary destination for general aviation pilots and passengers using the airport. Congestion on major north-south thoroughfares in the Austin area only served to compound the inconvenience experienced by general aviation pilots and passengers using Austin-Bergstrom International Airport to reach destinations in downtown Austin and areas north of the city. In addition, fewer general aviation facilities, such as T-hangars and aircraft tiedowns, were available at Austin-Bergstrom International Airport. Scarce general aviation resources at the new airport, and their relatively higher prices, combined with landside accessibility issues resulted in a number general aviation aircraft formerly based at Robert Mueller Municipal Airport being relocated to more outlying general aviation airports, Georgetown and San Marcos Municipal airports for example, rather than being relocated to Austin-Bergstrom International Airport.

Based aircraft statistics maintained by TxDOT indicate that prior to its closure in 1999, Robert Mueller Municipal Airport was home to approximately 283 based general aviation aircraft, including over 100 multiengine piston and jet aircraft. During its first year of operation, however, Austin-Bergstrom International Airport accommodated approximately 110 based general aviation aircraft. Around this time, San Marcos Municipal Airport experienced an increase of over 100 new/relocated general aviation aircraft, and Georgetown Municipal Airport attracted almost 120 new/relocated general aviation aircraft. These statistics indicate that many general aviation aircraft owners preferred to relocate their aircraft to general aviation airports located outside the Austin area instead of moving to Austin-Bergstrom International Airport.

Austin Executive Airpark

In addition to the closure of Robert Mueller Municipal Airport, another general aviation airport, Austin Executive Airpark, also closed during the late 1990s. Austin Executive Airpark was located on the northwest side of the City and accommodated approximately 90 based aircraft and over 90,000 general aviation operations in the year prior to its closure. As a general aviation airport, Austin Executive supported important components of Austin's aviation activity including flight training, air taxi and charter operations, as well as general aviation operations conducted for business and recreation. In addition, the airport was identified as a Reliever Airport in the FAA's 1998-2002 National Plan of Integrated Airport Systems (NPIAS). As a NPIAS reliever airport, Austin Executive was identified as an important airport in the national system whose role it was to divert general aviation traffic away from busier commercial service airports, such as Robert Mueller Municipal Airport and Austin-Bergstrom International Airport.

Austin Executive Airpark was a privately-owned facility that was open for public use. During the late 1990s, northern and northwestern areas of the City of Austin and Travis County experienced significant residential and commercial development as some major companies in the area, such as Dell Computer Corporation, experienced remarkable growth. In 1999, Dell Computer Corporation bought the airport property to support is growing operations with no intention of maintaining airport operations. Following the sale and closure of the airport, approximately 90 based general aviation aircraft were forced to relocate to other regional airports, primarily general aviation airports in northern portions of the study area such as in Taylor, Georgetown, and Burnet.

Summary

The closure of Robert Mueller Municipal Airport and Austin Executive Airpark significantly impacted pilots in the Austin area and general aviation activities occurring in and around the City. Moving to Austin-Bergstrom International Airport provided a wealth of opportunities for improved and expanded air service for the Central Texas region. However, Austin-Bergstrom International Airport's location, high traffic levels by large commercial jets, and relatively higher rentals for general aviation support facilities, made the new airport uninviting for general aviation pilots forced to relocate from Mueller and Austin Executive. Significant numbers of general aviation pilots and aircraft owners moved their aircraft from Austin airports to other regional airports, such as those in Georgetown, San Marcos, and Burnet. While the other regional airports have expanded to accommodate these new based aircraft, many Austin-area aircraft owners are now forced to drive a greater distance to access their aircraft. In addition, transient general aviation activity that used to be supported by Robert Mueller Municipal Airport, located roughly 3-miles from the Austin city-center, is now supported by airports, namely Austin-Bergstrom International Airport and to a lesser extent, Georgetown Municipal Airport and San Marcos Municipal Airport, located further from the city-center.

Pflugerville Study

The City of Pflugerville completed "*The New Pflugerville Airport Site Selection Study"* in December 2000. The goal of this study, which was conducted by URS Greiner Woodward Clyde, was to identify and quantify potential aviation demand within a 30-mile radius of Pflugerville and to determine whether the identified demand was sufficient to support the development of a new airport. Key findings of the Pflugerville study included the following:

- Based on the results of the study's pilot survey effort, it was determined that there was significant interest in the development of a new general aviation airport in Pflugerville
- The study's recommended forecast of aviation activity estimated a new facility in Pflugerville to support 222 based aircraft and almost 100,000 annual operations in its first year of operation. Both based aircraft and total aircraft operations were projected to grow at an average annual rate of 3.5 percent over the projection period, increasing to approximately 440 based aircraft and approximately 200,000 total annual aircraft operations by 2020.
- Based on pilot survey data and other analyses conducted in the study, it was recommended that the new airport be developed with an Airport Reference Code (ARC) of C-II, a 7,000 foot-long runway with a magnetic heading of 17/35, a precision instrument approach, and other ancillary airport facilities.
- The study examined three alternatives for the siting of the airport, the recommended site had the most favorable topography, fewest number of affected property owners, and was located proximate to State Highway 130.
- The study estimated that construction costs of the new airport would total approximately $47 million and the airport would have a 20-year development plan totaling an additional $69 million.

While the Pflugerville study identified sufficient demand for the construction of a new airport in the city, and that the development would be financially feasible, local conditions resulted in the study's findings and recommendations not being pursued by the City of Pflugerville.

House Bill 2522

The Regular Session of the Seventy-Seventh State of Texas Legislature passed House Bill 2522 in April, 2001. Similar legislation was passed by the Senate during the same month, and the bill was signed into law by the Governor on June 15, 2001. The bill calls for the Texas Department of Transportation (TxDOT) to establish and maintain a state airport in Central Texas. Important provisions specifically identified in the law include the following (emphasis added):

- TxDOT, in consultation with the State Aircraft Pooling Board, shall establish a state airport in Central Texas that is open to the general public
- Factors considered in determining the location of the ***new*** airport shall include the convenience, comfort, and accommodation of air traffic flying into and departing from the Central Texas region; and the safe operation of aircraft flying into and departing from the Central Texas region
- Factors that **may not** be considered in determining the appropriate location for the new airport include the following:
    - Property in a municipality without the approval of the governing body of that municipality
    - Property outside of a municipality without the approval of the commissioners court of the county in which the property is located
    - **The property in Austin, Texas, identified as Robert Mueller Municipal Airport**
- TxDOT may only utilize federal matching funds, federal grants, in-kind contributions, private sector funds, nonprofit grants, and local government funding for the establishment of a new airport

It is within the context of this legislation, and the provisions set forth therein, that the Feasibility Study and the other study components will proceed. New legislation that may be introduced and/or any changes to this legislation will be monitored throughout the study.

Conclusion

The closures of both Robert Mueller Municipal Airport and Austin Executive Airpark significantly impacted aviation in the Austin area. Austin-Bergstrom International Airport and its commercial passenger facilities are a significant improvement to similar facilities at Robert Mueller Municipal Airport. The move to Austin-Bergstrom will allow the airport itself and the air service providers operating at the airport to grow, expand, and improve to meet the growing and changing commercial service needs of Central Texas. General aviation aircraft owners, pilots, and users, especially of small general aviation aircraft, were forced to find new locations to base their aircraft following the airport closures. Higher costs and significant amounts of large jet traffic at Austin-Bergstrom International Airport tended to make general aviation pilots more inclined to move their aircraft to general aviation airports located further from their residences.

The City of Pflugerville, recognizing the significant impacts that the closures of Robert Mueller Municipal Airport and Austin Executive Airpark had on general aviation activity in Central Texas, examined the feasibility of developing a new general aviation airport. The Pflugerville study identified that sufficient demand existed within a 30-mile radius of the City for a new general aviation airport. The study went on to examine potential development sites and alternatives, however, local conditions resulted in the study's ultimate recommendations to build a new airport to not be pursued.

The Texas State Legislature also recognized the effects that the move to Austin-Bergstrom International Airport and the closures of Robert Mueller and Austin Executive had on general aviation in Central Texas and passed House Bill 2522. This house bill, signed into law in June, 2001, calls for TxDOT to examine the feasibility and options available for establishing a new state airport in Central Texas that is open for public use. The law further stipulates that the former site of Robert Mueller Municipal Airport should not be considered as a possible site for the new airport. The purpose of this study is to examine the feasibility of establishing a new airport, as well as to identify a potential site that can conveniently accommodate demand for general aviation activity with minimal or no environmental impacts.

CHAPTER TWO
INVENTORY OF EXISTING CONDITIONS

A number of existing airports are located within the study area. Many of these facilities have been impacted as general aviation airports in the Austin area have closed over recent years. While these existing airports currently accommodate the aviation demand generated in the Central Texas area, this study is tasked with identifying the potential demand for a new general aviation airport. An important component of this analysis is examining existing facilities in the study area and determining the need for and the potential impacts of a new facility. The primary goals of developing a new general aviation airport in the study area are to accommodate the area's growing aviation demand as well as to better serve existing business and recreational activity.

Data relating to the following characteristics are presented for the airports located in the study area:

- Airport Location/Role
- Airport Facilities
- Area Airport Activity
- Airspace Analysis
- Wind Analysis
- Conclusion

This data will provide a general understanding of existing airports in the study area, their facilities, and current activity levels and characteristics.

Airport Location/Role

There are 13 public use airports located in the seven county study area identified in this analysis. This study examines those airports in the study are that are open to public use, whether they are owned by public or private entities. **Exhibit 2-1** depicts the location of these airports. There are a number of privately owned airports in the study area that are not open to public; they are not included in this analysis. Summary information regarding these airports, their location, and their identified role in the Texas Airport System Plan is presented in **Table 2-1**.

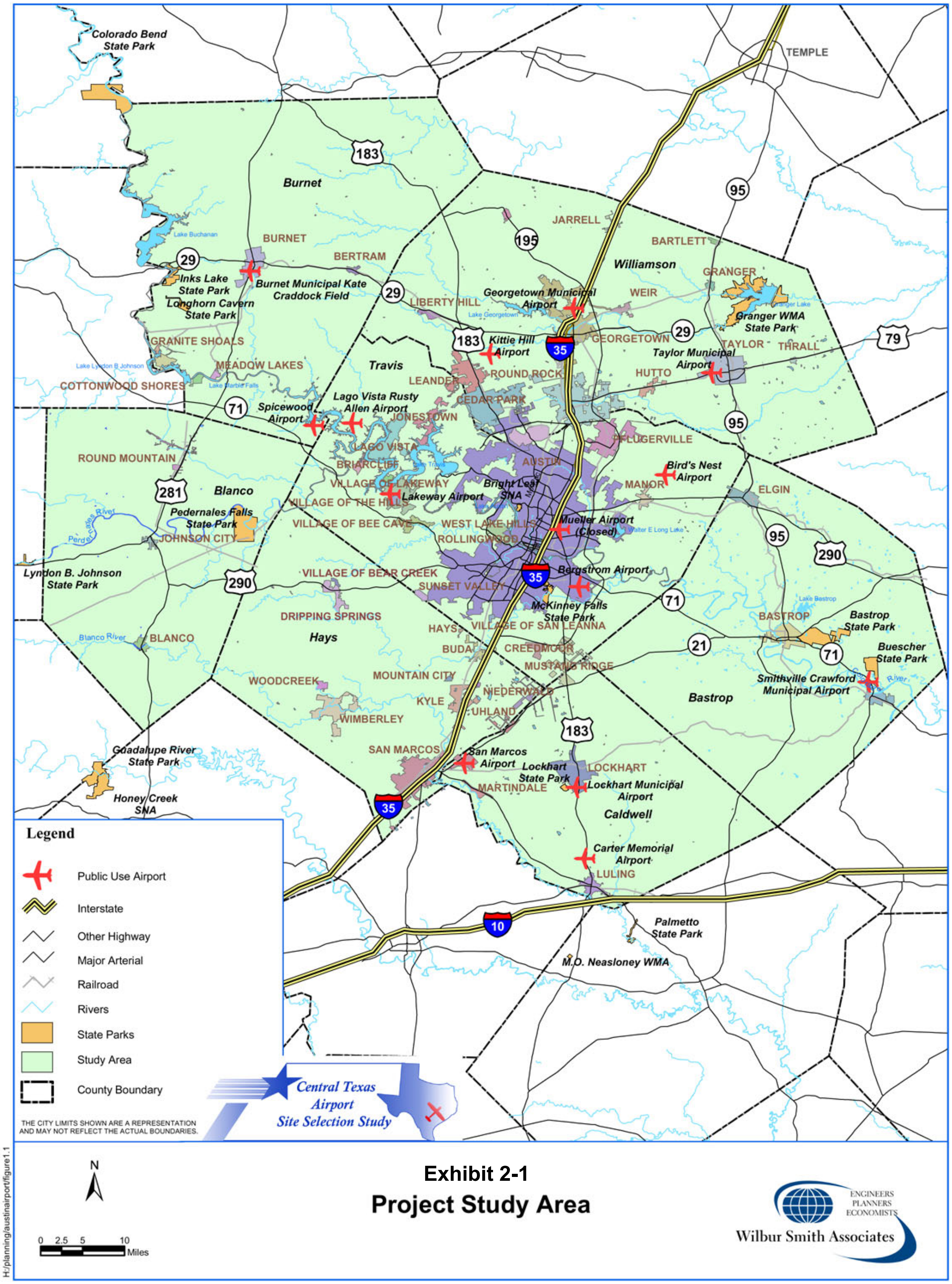
Legend
Public Use Airport
Interstate
Other Highway
Major Arterial
Railroad
Rivers
State Parks
Study Area
County Boundary
THE CITY LIMITS SHOWN ARE A REPRESENTATION AND MAY NOT REFLECT THE ACTUAL BOUNDARIES.
Central Texas Airport Site Selection Study
Burnet
Travis
Williamson
Blanco
Hays
Bastrop
Caldwell
TEMPLE
Colorado Bend State Park
Inks Lake State Park
Longhorn Cavern State Park
Burnet Municipal Kate Craddock Field
Georgetown Municipal Airport
Kittie Hill Airport
Taylor Municipal Airport
Granger WMA State Park
Spicewood Airport
Lago Vista Rusty Allen Airport
Lakeway Airport
Bird's Nest Airport
Mueller Airport (Closed)
Bergstrom Airport
McKinney Falls State Park
Pedernales Falls State Park
Lyndon B. Johnson State Park
Bastrop State Park
Buescher State Park
Smithville Crawford Municipal Airport
San Marcos Airport
Lockhart State Park
Lockhart Municipal Airport
Carter Memorial Airport
Guadalupe River State Park
Honey Creek SNA
Palmetto State Park
M.O. Neasloney WMA
Bright Leaf SNA
Exhibit 2-1
Project Study Area
0 2.5 5 10 Miles
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Table 2-1
Airport Location/Role Information

Airport Name	Associated City	County	Ownership/Use	Texas Airport System Plan Role
Austin-Bergstrom International Airport	Austin	Travis	Public/Public	Commercial Service
Bird's Nest Airport	Austin	Travis	Private/Public	NA
Lakeway Airpark	Austin	Travis	Private/Public	NA
Lago Vista Tx – Rusty Allen Airport	Lago Vista	Travis	Public/Public	General Utility
Kittie Hill Airport	Leander	Williamson	Private/Public	NA
San Marcos Municipal Airport	San Marcos	Hays	Public/Public	Reliever
Spicewood Airport	Spicewood	Williamson	Private/Public	NA
Taylor Municipal Airport	Taylor	Williamson	Public/Public	General Utility
Georgetown Municipal Airport	Georgetown	Williamson	Public/Public	Reliever
Lockhart Municipal Airport	Lockhart	Caldwell	Public/Public	General Utility
The Carter Memorial Airport	Luling	Caldwell	Public/Public	Basic Utility
Smithville Crawford Municipal Airport	Smithville	Bastrop	Public/Public	General Utility
Burnet Municipal – Kate Craddock Field Airport	Burnet	Burnet	Public/Public	Transport

Source: FAA Form 5010

As shown in Table 2-1, Blanco County is the only county in the study not having at least one public use airport. Only publicly owned airports were included in the Texas Airport System Plan. As shown in the table, publicly owned airports in the study area were identified to have system roles ranging from commercial service to basic utility. Roles identified in the Texas Airport System Plan can be defined as follows:

- **Commercial Service** – commercial service airports are those that offer scheduled service by major airlines, national airlines, and/or regional airlines. All commercial service airports provide access by business jets and commercial jet transport aircraft.
- **Reliever** – reliever airports relieve congestion at metropolitan commercial service airports by providing alternative facilities for general aviation use.
- **General Aviation Transport** – general aviation transport airports provide community access by business jets.
- **General Aviation General Utility** – general utility airports provide community access by single and light twin-engine aircraft and a limited number of business jets.
- **General Aviation Basic Utility** – basic utility airports provide air access for communities less than ½ hour drive from commercial, reliever, transport, or general utility airports. They typically support essential but low level activity.

Texas Airport System Plan roles are presented in this analysis to provide a summary functional description of each airport and to provide a general understanding of the way in which TxDOT plans for these airports to fit into the State airport system.

Airport Facilities

Airports in the study area have a wide range of existing facilities and can accommodate a vast range of aviation activity. Many airside and landside facilities, including aircraft storage facilities, are required to support aviation activity at an airport. Runway characteristics and approach type, however, are some of the most important factors determining the levels and types of aviation activity that an airport can accommodate. Summary data regarding primary runway characteristics and approach types at airports in the study area are presented in **Table 2-2**.

Table 2-2
Airport Facilities Summary

Airport Name	Primary Runway Orientation	Primary Runway Length (feet)	Runway Surface	Primary Runway Approach Type	Crosswind Runway
Austin-Bergstrom International Airport	17R/35L	12,248	Concrete	Precision	Parallel
Bird's Nest Airport	16/34	2,722	Asphalt	Visual	Yes, turf
Lakeway Airpark	16/34	3,865	Asphalt	Non-precision	No
Lago Vista Tx – Rusty Allen Airport	15/33	3,808	Asphalt	Non-precision	No
Kittie Hill Airport	07/25	3,450	Turf	Visual	2, turf
San Marcos Municipal Airport	12/30	5,603	Asphalt	Precision	3, asphalt
Spicewood Airport	17/35	3,900	Asphalt	Visual	No
Taylor Municipal Airport	17/35	3,498	Asphalt	Non-precision	No
Georgetown Municipal Airport	18/36	5,000	Asphalt	Non-precision	Yes, asphalt
Lockhart Municipal Airport	18/36	4,001	Asphalt	Non-precision	No
The Carter Memorial Airport	17/35	2,790	Asphalt	Visual	Yes, turf
Smithville Crawford Municipal Airport	17/35	4,000	Asphalt	Non-precision	No
Burnet Municipal – Kate Craddock Field Airport	01/19	5,000	Asphalt	Non-precision	No

Source: FAA Form 5010

As shown in Table 2-2, Austin-Bergstrom International Airport has the longest primary runway in the study area. At over 12,000 feet, the airport's primary runway can accommodate even the largest commercial service aircraft in the current operating fleet. Three other airports in the study area including: San Marcos Municipal, Georgetown Municipal, and Burnet Municipal-Kate Craddock Field have primary runways of 5,000 feet or greater. In most cases airports with runways measuring 5,000 feet or greater can accommodate operations by corporate jet aircraft, an important and growing component of the national and regional general aviation fleet.

Area Airport Activity

Airport activity is typically discussed in terms of aircraft operation and based aircraft statistics. In most cases, these statistics represent estimates and are at best a snapshot-in-time representation of an airport's activity characteristics. Aircraft operations statistics are most reliable at airports having an Air Traffic Control Tower (ACTC), however, Austin-Bergstrom International Airport is the only airport in the study area with an ATCT. At airports without an ATCT, aircraft operations statistics typically represent estimates prepared by the airport manager and may only represent an order-of-magnitude estimate of actual activity. Based aircraft statistics are also typically estimated by airport management. Based aircraft numbers typically represent a snapshot in time and can fluctuate throughout the year. Date presented in the following sections was compiled from each airport's most recent FAA 5010 Form and verified with TxDOT. In most cases the data presented is based on airport management estimates and provides an order-of-magnitude estimate of activity characteristics. A common source of data was used in an effort to maximize consistency.

Aircraft Operations

An aircraft operation is defined as either a takeoff or a landing. A standard touch-and-go procedure, for instance, in which a pilot lands an aircraft and takes off without leaving the active runway, would count as two operations. Aircraft operations are typically broken-out into the following categories:

- **Air Carrier** – operations conducted by scheduled air carrier operators
- **Commuter** – operations conducted by scheduled air carrier operators
- **Air Taxi** – Non-scheduled or chartered aircraft typically hired by a group or individual for point-to-point travel
- **Local General Aviation (GA)** – an operation conducted by a pilot/aircraft that has not left the airports traffic pattern, often represents training operations
- **Itinerant General Aviation (GA)** – an operation conducted by a pilot/aircraft coming from another airport or by an aircraft that has left the airport's standard traffic pattern
- **Military** – an operation conducted by a military aircraft

Table 2-3 presents summary aircraft activity statistics for study area airports.

Table 2-3
Summary Aircraft Activity Statistics

Airport Name	Air Carrier	Commuter	Air Taxi	Local GA	Itinerant GA	Military	Total
Austin-Bergstrom Int. Airport	97,168	16,234	0	12,611	84,948	8,225	219,186
Bird's Nest Airport	0	0	0	2,280	3,420	0	5,700
Lakeway Airpark	0	0	0	9,000	4,500	0	13,500
Lago Vista Tx – Rusty Allen Airport	0	0	0	17,000	8,450	0	25,450
Kittie Hill Airport	0	0	0	15,200	7,600	0	22,800
San Marcos Municipal Airport	0	0	276	64,400	36,800	2,000	103,476
Spicewood Airport	0	0	0	3,000	1,500	0	4,500
Taylor Municipal Airport	0	0	0	6,120	9,180	0	15,300
Georgetown Municipal Airport	0	0	873	68,400	102,600	0	171,873
Lockhart Municipal Airport	0	0	12	11,600	5,800	0	17,412
The Carter Memorial Airport	0	0	0	600	300	0	900
Smithville Crawford Municipal Airport	0	0	0	3,400	1,850	800	6,050
Burnet Municipal – Kate Craddock Field Airport	0	0	0	11,880	11,700	600	24,180
Study Area Total	**97,168**	**16,234**	**1,161**	**225,491**	**278,648**	**11,625**	**630,327**

Source: TxDOT, FAA Form 5010

As shown in Table 2-3, data indicates study area airports accommodate total annual operations levels ranging from approximately 900 annual operations at The Carter Memorial Airport to over 219,000 annual operations at Austin-Bergstrom International Airport. Austin-Bergstrom

International Airport is the only airport in the study area that accommodates air carrier and commuter operations, categories of scheduled air carrier operations.

Based Aircraft

Based aircraft data was taken from each airport's most recent FAA 5010 Form and other sources. Based aircraft statistics at an airport tend to fluctuate over time; however, the data presented should provide general information regarding the number and types of aircraft based at each airport. Current based aircraft statistics, presented by aircraft type, for study area airports are summarized in **Table 2-4**.

Table 2-4
Summary Based Aircraft Statistics (2002)

Airport Name	Single Engine	Multi-engine	Jet	Other	Total Based Aircraft
Austin-Bergstrom International Airport	91	57	23	25	196
Bird's Nest Airport	19	0	0	8	27
Lakeway Airpark	42	3	0	0	45
Lago Vista Tx – Rusty Allen Airport	54	6	0	3	63
Kittie Hill Airport	75	1	0	0	76
San Marcos Municipal Airport	189	32	4	0	225
Spicewood Airport	25	5	0	0	30
Taylor Municipal Airport	47	2	1	0	50
Georgetown Municipal Airport	214	30	6	0	250
Lockhart Municipal Airport	57	1	0	0	58
The Carter Memorial Airport	3	0	0	1	4
Smithville Crawford Municipal Airport	24	1	0	0	25
Burnet Municipal – Kate Craddock Field Airport	50	5	0	0	55
Study Area Total	**890**	**143**	**34**	**37**	**1,104**

Source: TxDOT, FAA Form 5010

As shown in Table 2-4, based aircraft counts at study area airports range from four at The Carter Memorial Airport to 250 at Georgetown Municipal Airport. Austin-Bergstrom International Airport, with 196 based aircraft, and San Marcos Municipal Airport, with 225 based aircraft, also accommodate a significant percentage of the study area's based aircraft. It is important to note that 23 jets are based at Austin-Bergstrom International Airport. Georgetown Municipal Airport (6), San Marcos Municipal Airport (4), and Taylor Municipal Airport (1) are the only other airports in the study area with based jets. Current data indicates that 1,104 aircraft are currently based at airports in the study area.

Airspace Analysis

The study area identified for the Central Texas Airport Site Selection Study is Travis County and the six contiguous counties. This airspace analysis will examine general air space characteristics and classifications in the study area and identify factors that could potentially impact general aviation aircraft operations in the study area. It is important to note that this analysis is intended to serve as an overview of airspace for the general study area and may be used as a means for narrowing potential sites for the new airport. Potential new airport sites will be examined in greater detail relative to a number of factors, including site-specific airspace concerns, in the site selection component of the study. The current air space characteristics of the study area, as depicted on the San Antonio Sectional Aeronautical Chart, are presented in **Exhibit 2-2**.

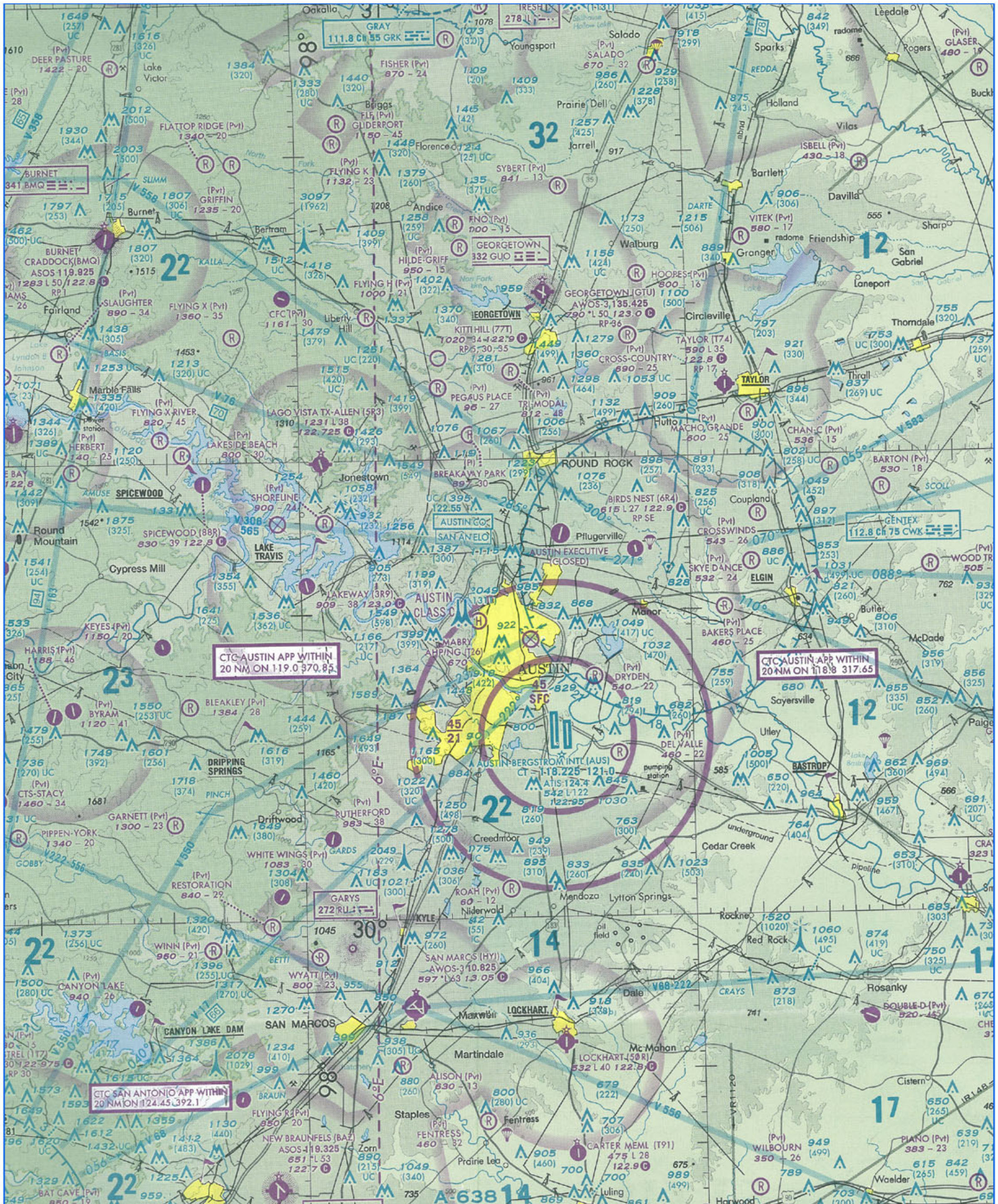

Exhibit 2-2
Study Area Airspace

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Through Federal Aviation Regulations, airspace classifications have been developed to promote the safe and efficient movement and control of aircraft during flight and approach/departure procedures. Airspace classifications are identified on sectional aeronautical charts published by the FAA's National Aeronautical Charting Office. FAR Part 71 and FAR Part 73 establish classifications of airspace with the following characteristics:

- Class A Airspace – Class A airspace is not shown on aeronautical charts. It begins at 18,000 feet above mean sea level (MSL) and extends to higher altitudes. Only pilots flying IFR can enter this airspace and prior permission is required. Class A airspace would not impact the operation of a new general aviation airport in the study area.

- Class B Airspace – Class B airspace is found around major airports. Pilots must get permission to enter this airspace from the controlling agency, typically the airport's air traffic control tower. There are no areas of Class B airspace in the study area.

- Class C Airspace – Class C airspace is found around heavy traffic airports. Although pilots are not required to get permission to enter this airspace, they are required to establish two-way radio communication with the controlling agency, typically the airport's air traffic control tower.

  Class C airspace usually incorporates airspace that is composed of two concentric cylinders that surround a controlled airport. The first cylinder has a 5NM radius and extends from the surface to 1,200 feet above the elevation of the airport. The second ring has a radius of 10NM and starts at 1,200 feet and extends to 4,000 feet above the airport elevation. The outer area, which has no regulatory requirements, constitutes a cylinder with a 20NM radius, and serves as an indication for pilots intending to cross either of the concentric cylinders to contact air traffic control. In general, the site of a potential new airport should be kept at least 5 NM from airports protected by Class C airspace and not within 10 NM of the approach and departure areas of these airports.

  - Austin-Bergstrom International Airport is the sole airport in the study area protected by Class C airspace.

- Class D Airspace – Class D airspace exists at any airport with an air traffic control tower and it typically extends 5 miles from the airport to an altitude of 2,500 feet above ground level (AGL). Pilots must establish two-way radio communication with the controlling agency, usually the air traffic control tower, before entering this classification of airspace. During period when the control tower is not in operation, Class D airspace ceases to exist. There are no areas of Class D airspace located in the study area.

- Class E Airspace – Class E airspace is known as general controlled airspace and is located near Federal Airways ("victor airways") and around airports with no air traffic control tower. Areas of Class E airspace in the study area include the following:

  - Georgetown Municipal Airport

- Taylor Municipal Airport
- Austin area
- Lago Vista TX – Rusty Allen Airport
- Burnet Municipal – Kate Craddock Field Airport
- Horseshoe Bay Airport (private)
- San Marcos Municipal Airport
- Lockhart Municipal Airport

- Class G Airspace – Class G airspace is referred to as uncontrolled airspace and is not depicted on aeronautical charts. This classification of airspace comprises all airspace not identified as another class. Anyone can operate in this airspace as long as visibility minimums are met. Class G airspace will not impact the operation of a new general aviation airport in the study area.

- Restricted Areas – Restricted areas contain airspace identified by an area on the surface of the earth within which the flight of aircraft, while not wholly prohibited, is subject to restrictions. Restricted areas denote the existence of unusual, often invisible, hazards to aircraft; examples include artillery firing, aerial gunnery, or guided missiles. Penetration of restricted areas without authorization from the using or controlling agency may be extremely hazardous to the aircraft and its occupants. There are no areas of restricted airspace in the study area.

- Prohibited Areas – Prohibited areas contain airspace of defined dimensions identified by an area of the surface of the earth within which the flight of aircraft is prohibited. Such areas are established for security or other reasons associated with the national welfare. Prohibited areas are published in the National Register and are depicted on aeronautical charts. There are no areas of prohibited airspace in the study area.

- Military Operations Areas (MOAs) – MOAs consist of airspace of defined vertical and lateral limits established for the purpose of separating certain military training activities from IFR traffic. Whenever a MOA is being used, nonparticipating IFR traffic may be cleared through a MOA if IFR separation can be provided by air traffic control. Otherwise, air traffic control will reroute or restrict nonparticipating IFR traffic. Pilots operating under VFR should exercise caution while flying within a MOA when military activity is being conducted. Prior to entering an active MOA, pilots should contact the controlling agency for traffic advisories. There are no MOAs in the study area.

- Alert Areas – Alert areas are depicted on aeronautical charts to inform nonparticipating pilots of areas that may contain a high volume of pilot training or an unusual type of aerial activity. Pilots should be particularly alert when flying in these areas. All activity within an alert area shall be conducted in accordance with CFRs, without waiver, and pilots of participating aircraft as well as pilots transiting the areas shall be equally responsible for collision avoidance. There no alert areas in the study area.

As the summary descriptions of airspace classifications indicate, different classes of airspace have different characteristics, dimensions, altitudes, and requirements based on the types of activity that they are intended to support. Existing airspace classifications in the study area that could have the potential to impact general aviation operation at a new general aviation airport will be considered in the site selection and master planning phases of this study. In addition, the number and location of tall towers, also depicted on the aeronautical chart, will be another important airspace consideration examined in the selection and master planning phases.

Wind Analysis

The orientation of the runways to the prevailing wind direction is critical to the safe operation of aircraft, especially small single engine aircraft that are more susceptible to crosswinds. Crosswinds are winds perpendicular to the runway or path of an aircraft. Wind data for the analysis was obtained from the National Climatic Data Center in Asheville, North Carolina. Hourly wind readings from a source in Austin, the representative center of the study area, were used in this analysis.

Meteorological conditions dictate that manner in which aircraft must be operated during flight. Depending on meteorological conditions, including visibility and cloud height, visual or instrument flight rules must be utilized by pilots. Visual flight rules generally apply when meteorological conditions result in good visibility and high, broken clouds. Instrument flight rules govern flight during periods of limited visibility. Wind data examined in this analysis includes data gathered during visual meteorological conditions as well as all weather conditions. All weather data is comprised of all data readings available for Austin, and includes data compiled during both visual and instrument meteorological conditions.

The FAA recommends 95 percent wind coverage for crosswind components based on specific Airport Reference Codes. The 95 percent wind coverage is computed on the basis of the crosswind not exceeding a specified speed (knots) for a specified size of aircraft. For example, a crosswind speed of 10.5 knots is used to calculate 95 percent wind coverage for smaller aircraft, based on wingspan, while a crosswind speed of 16 knots is used larger aircraft, and a crosswind speed of 20 knots is used for the largest aircraft. The methodology for computing coverage is detailed in AC 150/530013 “Airport Design”.

Table 2-5 presents the results of a wind analysis using the wind data discussed above calculated for 10.5 knot and 16 knot crosswinds.

Table 2-5
Summary Wind Coverage Data

	VFR Coverage		All Weather Coverage	
Potential Runway Orientation (degrees)	10.5 Knot Coverage	16 Knot Coverage	10.5 Knot Coverage	16 Knot Coverage
10-190	97.21%	99.80%	97.34%	99.81%
20-200	95.64%	99.67%	95.88%	99.68%
30-210	93.45%	99.48%	93.84%	99.51%
40-220	90.85%	99.19%	91.39%	99.24%
50-230	88.08%	98.77%	88.76%	98.85%
60-240	85.68%	98.30%	86.44%	98.41%
70-250	84.04%	97.90%	84.82%	98.04%
80-260	83.31%	97.69%	84.10%	97.82%
90-270	83.54%	97.69%	84.29%	97.81%
100-280	84.70%	97.93%	85.36%	98.02%
110-290	86.69%	98.33%	87.22%	98.40%
120-300	89.17%	98.81%	89.55%	98.86%
130-310	91.83%	99.26%	92.09%	99.28%
140-320	94.43%	99.61%	94.58%	99.61%
150-330	96.49%	99.83%	96.60%	99.82%
160-340	97.82%	99.91%	97.89%	99.91%
170-350	98.33%	99.91%	98.39%	99.91%
180-360	98.09%	99.88%	98.17%	99.88%

Source: National Climatic Data Center, Asheville, NC; ATT Observations, 1990-2000

As the wind coverage statistics summarized in Table 2-5 indicate, a potential runway orientation with the magnetic compass headings of 170 and 350 provides the greatest coverage in both VFR and all-weather conditions. Generally, runway alignments within 30 degrees of that heading would also provide sufficient coverage based on FAA standards.

The orientations of existing area airports were evaluated to validate the wind data. Runway numerals for each runway end are determined from the approach direction to the runway end and should be equal to one-tenth of the magnetic azimuth of the runway centerline, measured in a clockwise direction from magnetic north. After reviewing the area airports it was found that most airports generally have a north-south alignment. **Table 2-6** presents runway alignments of existing study area airports. Although the true bearing of the runways will not change over time, the magnetic bearing will change as the location of magnetic north shifts.

Table 2-6
Study Area Airport Runway Alignments

Airport Name	Primary Runway Orientation
Austin-Bergstrom International Airport	17R/35L
Bird's Nest Airport	16/34
Lakeway Airpark	16/34
Lago Vista Tx – Rusty Allen Airport	15/33
Kittie Hill Airport	07/25
San Marcos Municipal Airport	12/30
Spicewood Airport	17/35
Taylor Municipal Airport	17/35
Georgetown Municipal Airport	18/36
Lockhart Municipal Airport	18/36
The Carter Memorial Airport	17/35
Smithville Crawford Municipal Airport	17/35
Burnet Municipal – Kate Craddock Field Airport	01/19

Data from Table 2-6 substantiates the findings of the wind analysis. The wind readings taken in both visual and instrument meteorological conditions indicate that a runway with a north-south alignment would provide the best wind coverage in all weather conditions. Furthermore, the primary runways of 12 of the 13 airports included in the study area have a similar north-south alignment. While the exact headings of a runway at a new airport may be impacted by a number of factors including property dimensions and topography, a runway heading within a few degrees of the magnetic north and south azimuths should provide maximum wind coverage in most locations in the study area.

Conclusion

This analysis has examined existing conditions at study area airports as well as other regional characteristics that have the potential to impact existing and potential new general aviation airports in the study area. The analysis indicates that a significant portion of the area's total general aviation activity is accommodated by three airports in the study area; Austin-Bergstrom International Airport, Georgetown Municipal Airport, and San Marcos Municipal Airport, each of which has a runway of at least 5,000 feet. The ability of these facilities to accommodate projected levels of future general aviation activity for the study area will be an important consideration when examining the need for and potential feasibility of a new general aviation airport in Central Texas. If analyses conducted in following sections of this report indicate that a new general aviation airport is needed and feasible, area airspace and wind characteristics summarized in this section will likely impact that facility's location and layout.

CHAPTER THREE
STUDY AREA CHARACTERISTICS

The study area identified for this analysis is Travis County and the six contiguous counties including: Bastrop, Blanco, Burnet, Caldwell, Hays, and Williamson. An important component of this feasibility study is identifying the demand for aviation facilities and services in the study area, and determining whether the identified demand is sufficient to support the establishment of a new general aviation airport in Central Texas. Aviation demand is impacted by a vast number of factors. In addition, different factors impact demand for commercial passenger services and general aviation activity. This analysis focuses on those factors that impact demand for general aviation facilities and activity in Central Texas. Data examined in this analysis of study area characteristics will be important factors used in developing the estimates and projections of aviation demand for Central Texas.

Demand for general aviation activity in any study area is an aggregate of demand from outside sources, such as transient pilots wanting to fly to Austin, as well as local aviation users and aircraft owners. Transient and local demand for general aviation in a study area is often correlated with demographic characteristics and trends. For example, as economic activity occurring in an area increases, more transient general aviation pilots may fly to the area to conduct business. Local demand for general aviation facilities and activity is also impacted by demographic characteristics and trends, and it is also significantly impacted by the tendencies of local aircraft owners.

Characteristics of the Central Texas study area will be examined for both the general public and the aviation community in the following sections:

- Demographic Data and Trends
- Ground Transportation System
- Registered Aircraft Owner Survey

Demographic data and trends will provide background information related to population, employment, and spending trends in the study area. These trends tend to directly impact the demand for aviation services in a study area and will be used in this analysis as a factor in quantifying and projecting aviation demand for Central Texas. In addition, data collected through a survey of registered aircraft owners will provide specific data regarding storage, usage, and demand characteristics of the aviation community in Central Texas.

Demographic Data and Trends

This section examines key demographic characteristics and trends in the study area. Demographic data and trends that will be examined in the following sections include the following:

- Population
- Employment

- Per Capita Income
- Gross Retail Sales
- Summary

Data for each of these factors will provide background information regarding demographic and socioeconomic trends in the study area. In most cases, demand for aviation services in an area is correlated to changes in demographic and socioeconomic characteristics. The demographic and socioeconomic characteristics examined in this analysis are the ones for which correlation with aviation demand tends to be the highest.

Population

Quantifying changes in population is an indirect method for assessing demand for a service or product in that area. In many airport planning studies, population is used as a variable in the estimation of demand for based aircraft and general aviation operations. In general, based aircraft numbers and general aviation activity levels in a study area tend to reflect changes in that area's population. As the population of an area increases, there naturally tends to be an increase in the number of aircraft owners and/or users of general aviation services. Furthermore, even those components of the population that do not use general aviation or own an aircraft generate additional demand for general aviation activities.

Historic (1990 Census) and current (2000 Census) population data for the counties in the study area, for Texas, and for the United States are summarized in **Table 3-1**.

Table 3-1
Historic (1999) and Current (2000) Population Data

County	1990 Census	2000 Census	Change	Percent Change 1990-2000
Bastrop	38,263	57,733	19,470	50.9%
Blanco	5,972	8,418	2,446	41.0%
Burnet	22,677	34,147	11,470	50.6%
Caldwell	26,392	32,194	5,802	22.0%
Hays	65,614	97,589	31,975	48.7%
Travis	576,407	812,280	235,873	40.9%
Williamson	139,551	249,967	110,416	79.1%
Study Area Total	**874,876**	**1,292,328**	**417,452**	**47.7%**
Texas	**16,986,510**	**20,851,820**	**3,865,310**	**22.8%**
United States	**248,709,873**	**281,421,906**	**32,712,033**	**13.1%**

Source: U.S. Bureau of the Census, CAPCO

As shown in Table 3-1, the study area experienced significant population growth during the 1990s, with its population increasing by almost 50 percent between 1990 and 2000. By comparison, the State of Texas experienced a population increase of almost 23 percent and the United States' population increased by just over 13 percent during the same period. These statistics indicate that Travis County experienced the greatest increase in total population, while Williamson County experienced the greatest percentage increase in population.

Projected population growth is another factor that will impact future study area characteristics and potential future demand for aviation services. Projected population growth trends for the counties in the study are summarized in **Table 3-2**.

Table 3-2
Projected Population Growth

County	2000 Census	2020 Projection	Change	Percent Change 2000-2020
Bastrop	57,733	97,601	39,868	69.1%
Blanco	8,418	11,756	3,338	39.7%
Burnet	34,147	51,044	16,897	49.5%
Caldwell	32,194	49,445	17,251	53.6%
Hays	97,589	178,784	81,195	83.2%
Travis	812,280	1,105,551	293,271	36.1%
Williamson	249,967	449,652	199,685	79.9%
Study Area Total	**1,292,328**	**1,943,833**	**651,505**	**50.4%**

Source: Texas State Data Center, Office of the State Demographer

Population projections for the study area indicate continued population growth between 2000 and 2020. As shown in Table 3-2, the population of the study is projected to increase by over 650,000 during the 20-year period, a population increase of over 50 percent. Travis County and Williamson County are projected to experience the most significant increases in total population. These two counties will account for more than 75 percent of all the population growth projected for the study area. Hays County, Williamson County, and Bastrop County are projected to experience the greatest percentage growth in population.

Historic and projected population statistics highlight the study area's rapid growth experienced during the 1990s and indicate that population growth is anticipated to continue through 2020. The growing population base of the study area undoubtedly generates growing levels of demand for many types of goods and services, including general aviation. Historic and projected population trends in the study area will be important factors in quantifying and projecting the area's demand for general aviation activity.

Employment

The employment characteristics of an area can provide interesting insight into an area's economy. Total employment in any area tends to fluctuate in conjunction with changes in the area's population, and in most cases, examining total population and total employment statistics tends to be duplicative. Examining employment statistics by industry sector, however, is a valuable tool in understanding the underpinnings of an area's economy. **Table 3-3** presents summary data for study area counties and presents total employment in those counties by major industry sectors.

Table 3-3
Study Area Employment by Sector

Sector	Bastrop	Blanco	Burnet	Caldwell	Hays	Travis	Williamson	Study Area Total
Agricultural, Forestry, Fishing, Hunting, Mining								
#	718	379	686	436	535	2,125	1,382	**6,261**
%	2.7%	9.6%	4.6%	3.3%	1.1%	0.5%	1.1%	**0.9%**
Construction								
#	3,555	443	2,266	1,374	4,299	34,281	9,850	**56,068**
%	13.4%	11.2%	15.1%	10.3%	8.5%	7.8%	7.6%	**8.2%**
Manufacturing								
#	3,123	287	1,280	1,894	5,035	58,079	24,086	**93,784**
%	11.8%	7.3%	8.5%	14.1%	10.0%	13.2%	18.6%	**13.8%**
Wholesale Trade								
#	688	144	364	451	1,192	10,575	3,875	**17,289**
%	2.6%	3.7%	2.4%	3.4%	2.4%	2.4%	3.0%	**2.5%**
Retail Trade								
#	2,788	449	2,007	1,523	6,118	47,191	15,841	**75,917**
%	10.5%	11.4%	13.4%	11.4%	12.1%	10.7%	12.3%	**11.2%**
Transportation, Warehousing, Utilities								
#	1,545	259	879	678	1,827	12,262	4,143	**21,593**
%	5.8%	6.6%	5.9%	5.1%	3.6%	2.8%	3.2%	**3.2%**
Information								
#	418	64	256	345	1,508	19,010	3,974	**25,575**
%	1.6%	1.6%	1.7%	2.6%	3.0%	4.3%	3.1%	**3.8%**
Finance, Insurance, Real Estate, Rental, Leasing								
#	1,525	221	925	788	2,777	30,746	10,478	**47,460**
%	5.7%	5.6%	6.2%	5.9%	5.5%	7.0%	8.1%	**7.0%**
Professional, Scientific, Management, Administrative								
#	2,081	297	954	957	4,386	59,965	13,503	**82,143**
%	7.8%	7.5%	6.4%	7.1%	8.7%	13.6%	10.5%	**12.1%**
Educational, Health, Social Services								
#	4,707	602	2,697	2,590	12,123	76,592	20,865	**120,176**
%	17.7%	15.3%	18.0%	19.3%	24.0%	17.4%	16.2%	**17.7%**
Arts, Entertainment, Accommodation, Food Service								
#	1,379	328	1,258	647	4,915	36,575	6,395	**51,497**
%	5.2%	8.3%	8.4%	4.8%	9.7%	8.3%	4.9%	**7.6%**
Other Services								
#	1,506	242	742	598	2,218	20,408	6,145	**31,859**
%	5.7%	6.1%	5.0%	4.5%	4.4%	4.6%	4.8%	**4.7%**
Public Administration								
#	2,496	229	660	1,122	3,551	33,352	8,655	**50,065**
%	9.4%	5.8%	4.4%	8.4%	7.0%	7.6%	6.7%	**7.4%**
Study Area Total								
#	**26,529**	**3,944**	**14,974**	**13,403**	**50,484**	**441,161**	**129,192**	**679,687**
%	**4%**	**1%**	**2%**	**2%**	**7%**	**65%**	**19%**	**100.0%**

Source: U.S. Bureau of the Census

As shown in Table 3-3, total employment in the study area is approximately 679,000 persons. The majority of employment can be attributed to Travis County, with over 441,000 employed or 65 percent of the study area total. Nearly 130,000 persons, or 19 percent of the study area total, are employed in Williamson County. These statistics indicate that Education, Health, and Social Services is the largest employment sector in the study area, accounting for approximately 18 percent of the area's total employment. The strength of this sector can be attributed to the University of Texas' location in the study area. The Manufacturing; Professional, Scientific Management, and Administrative; and Retail Trade sectors are the only other industry sectors in the study area accounting for more than 10 percent of the area's total employment. It is also important to note that the Public Administration sector, in this case State and city governments, employs a significant amount of persons in the study area.

Additional information regarding the study area's employment and economic characteristics can be gained by comparing employment by sector in the area to similar Texas and national data. Employment data for the study area, Texas, and the United States is summarized in **Table 3-4**.

Table 3-4
Employment by Industry Sector - Comparison

Sector	Study Area	Texas	United States
Agricultural, Forestry, Fishing, Hunting, Mining	0.9%	2.7%	1.9%
Construction	8.2%	8.1%	6.8%
Manufacturing	13.8%	11.8%	14.1%
Wholesale Trade	2.5%	3.9%	3.6%
Retail Trade	11.2%	12.0%	11.7%
Transportation, Warehousing, Utilities	3.2%	5.8%	5.2%
Information	3.8%	3.1%	3.1%
Finance, Insurance, Real Estate, Rental, Leasing	7.0%	6.8%	6.9%
Professional, Scientific, Management, Administrative	12.1%	9.5%	9.3%
Educational, Health, Social Services	17.7%	19.3%	19.9%
Arts, Entertainment, Accommodation, Food Service	7.6%	7.3%	7.9%
Other Services	4.7%	5.2%	4.8%
Public Administration	7.4%	4.5%	4.8%
Total	**100%**	**100%**	**100%**

Source: U.S. Bureau of the Census

Data depicted in Table 3-4 for the study area indicates the importance of the service sector and public administration. It is also important to note that manufacturing also employs a significant percentage of the study area's workforce. As reported in the Economic Impact of General Aviation in Texas 2002, these industry sectors are often considered as having a relatively high propensity to make use of aviation.

The economic characteristics of an area can also be described by examining its major employers. Major employers in the study area for the year 2000, the most recent information available, are listed in **Table 3-5**.

Table 3-5
Top 40 Employers in Austin Area (2000)

Employer	Number of Employees (2000)	Employer	Number of Employees (2000)
University of Texas at Austin	20,277	Texas Dept. of Mental Health	2,500
Dell Computer Corp.	19,500	Texas Dept. of Public Safety	2,474
Motorola Corp.	10,500	Southwestern Bell	2,467
City of Austin	10,000	St. David's Healthcare	2,433
Austin ISD	9,417	Texas Dept. of Human Services	2,233
HEB Grocery, Inc.	7,500	Texas Natural Resource Conservation Commission	2,232
Seton Healthcare	6,756	Kent Electronics	2,000
IBM Corp.	6,500	Randall's Food and Pharmacy	2,000
IRS/Austin Center	5,800	Faulkner Construction Co.	1,900
Advanced Micro Devices, Inc.	4,600	Texas Attorney General's Office	1,887
Solectron Texas	4,400	Texas Comptroller of Public Accounts	1,878
Round Rock ISD	4,000	Texas Workforce Commission	1,822
Wal-Mart Stores	3,800	Girling Health Care	1,800
Travis County Govt.	3,567	Leander ISD	1,800
Applied Materials	3,149	3M Austin	1,750
TxDOT	3,050	National Instruments, Inc.	1,658
United States Postal Service	3,003	Tivoli Systems, Inc.	1,650
Austin Community College	3,000	Southern Union Gas	1,573
Southwest Texas State University	3,000	MCI Services	1,500
Texas Dept. of Health	2,817	McDonalds	1,400

Source: Greater Austin Chamber of Commerce

As shown in Table 3-5, the University of Texas at Austin is the area's largest employer, and a number of other educational institutions are included in the list of top 40 employers in the study area. It is important to note that high-tech businesses, such as Dell Computer, Motorola, IBM, and Advanced Micro Devises represent some of the area's largest employers.

Per Capita Income

Per capita income measures the income of all economic entities, including businesses, governments, and individuals. A common economic characteristic of growing and developing areas is increases in per capita income. In addition, per capita income is one of the fundamental factors impacting the level of demand for goods and services in a study area, including the demand for general aviation. It is a common occurrence that as income rises, consumers will spend more on goods and services which in turn generates additional economic activity in and beyond the area being examined. **Table 3-6** summarizes historic changes in per capita income on the seven-county study area.

Table 3-6
Historic Per Capita Income

County	Per Capita Income 1989 (Constant $)	Per Capita Income 1999 (Constant $)	Change (Constant $)	Percent Change 1989-1999 (Constant $)
Bastrop	$13,368	$18,146	$4,778	35.7%
Blanco	$16,078	$19,721	$3,643	22.7%
Burnet	$14,964	$18,850	$3,886	26.0%
Caldwell	$11,995	$15,099	$3,104	25.9%
Hays	$14,824	$19,931	$5,107	34.5%
Travis	$19,628	$25,883	$6,255	31.9%
Williamson	$17,509	$24,547	$7,038	40.2%
Study Area Average	**$15,481**	**$20,311**	**$4,830**	**31.2%**
Texas	**$16,775**	**$19,617**	**$2,842**	**16.9%**
United States	**$18,746**	**$21,587**	**$2,841**	**15.2%**

Source: US Bureau of the Census, CAPCO

Data in Table 3-6 is presented in constant 1999 dollars, thereby eliminating the impacts of inflation. As shown in the table, per capita income in the counties included in this analysis increased significantly. Percentage increases in these counties between the years 1989 and 1999 ranged from almost 23 percent in Blanco County to over 40 percent in Williamson County. The study area's average per capita income increased by over 31 percent during the period, a percentage increase almost double what was experienced by Texas and by the United States.

Gross Retail Sales

Gross retail sales are often used as a statistical descriptor of the economic activity occurring in an area. Comparisons of historic gross retail sales in an area can provide information regarding not only the general level of economic activity occurring, but how the area's economy has changed over time. **Table 3-7** presents summary gross retail sales data for the study area.

Table 3-7
Gross Retail Sales

County	Gross Retail Sales 1990	Gross Retail Sales 2000	Change (Total $)	Percent Change 1990-2000 (Total $)
Bastrop	$220,588,750	$787,585,960	$566,997,210	257.0%
Blanco	$145,525,000	$296,944,750	$151,419,750	104.1%
Burnet	$261,278,350	$704,816,450	$443,538,100	169.8%
Caldwell	$149,081,220	$294,279,110	$145,197,890	97.4%
Hays	$672,813,570	$2,163,835,320	$1,491,021,750	221.6%
Travis	$11,770,253,950	$38,302,998,460	$26,532,744,510	225.4%
Williamson	$1,411,118,461	$7,536,161,680	$6,125,043,219	434.1%
Study Area Total	**$14,630,659,301**	**$50,086,621,730**	**$35,455,962,429**	**242.3%**

Source: Texas Comptroller of Public Accounts, Wilbur Smith Associates, Inc.

As presented in Table 3-7, Travis County accounts for the vast majority of retail sales in the study area. Between 1990 and 2000, gross retail sales in Travis County grew from almost $11.8 billion to over $38.3 billion, an increase of over $26.5 billion or roughly 225%. While Travis County accounts for most retail sales in the study area and experienced the largest increase in dollar terms, Williamson County experienced the largest percentage increase in gross retail sales, an increase of over 434%. Bastrop County and Hays County also experienced percentage increases in gross retail sales over 200 percent.

As the statistics indicate, gross retail sales in the study area more than doubled during the period 1990 to 2000. The significant increase in gross retail sales in the study area is a result of many factors; however, the area's rapid population growth and economic development successes were key components. It is important to note that the data presented in Table 3-7 is in 1990 and 2000 dollars. While inflation during the time period would tend to reduce the percentage increases show in the table, the real increases implied in the statistics illustrates a dynamic and growing study area economy.

Summary

The demographic factors and trends examined in this analysis illustrate the significant population growth and economic expansion/development experienced in the study area over recent years. Travis and Williamson Counties, and to lesser degree Hays County, continue to be the study area's most populated and economically developed counties, and as a result, meeting the aviation demands of these counties will be a primary focus of this analysis. Employment data also indicates that high-tech industries and the service sector comprise important components of the area's economy. Despite the recent economic downturn experienced throughout the nation and in the Central Texas region, the long-term population and employment growth opportunities for the study area are considerable. Data presented in the preceding sections was intended to provide background information. In later analyses, this data may provide important information from which projections of regional demand for general aviation activity may be developed.

Ground Transportation System

The transportation system of the Central Texas region, of which airports are a component, is dominated by an extensive roadway system. Although rail and other surface transportation facilities are available, the majority of the movement of goods and people is accommodated through the study area's roadways. The study area's roadway system will be examined in the following sections:

- Existing Roadway System
- Programmed and Planned Roadway Improvements

The interaction between the study area's airport system and roadway system is important because the vast majority of those utilizing general aviation in the study area reach the airports via the area's roadway network. Furthermore, one of the primary benefits experienced by the users of general aviation is time savings, this benefit can only be maximized if the surface access to and from general aviation airports allows for the efficient transportation of general aviation passengers, flight crews, and goods being transported.

Existing Roadway System

The centerpiece of the study area's existing roadway system is I-35, which extends north-south through its center. The study area's major population centers, including Georgetown, Round Rock, Austin, and San Marcos, are located along I-35. In addition, the study area's most active general aviation airports, such as Georgetown Municipal Airport and San Marcos Municipal Airport, are also located proximate to the interstate and undoubtedly benefit from the surface access that it provides. North-south surface transportation in the study area is augmented by US 183. East-west access throughout the study area is provided by several US highways including US 79 and US 29. Other State highways such as SH 71, SH 29, and SH 21, also provide east-west transportation.

While the existing roadway system is extensive, growing traffic congestion is a factor that impacts its efficiency. Statistics compiled by the Capital Area Metropolitan Planning Organization (CAMPO) indicate the while the population of their planning area, an area that includes Bastrop, Caldwell, Hays, Travis, and Williamson counties, increased by approximately 48 percent between 1990 and 2000, the total vehicle miles driven in the area during that period increased by approximately 73 percent. This data illustrates that during the study area's rapid population growth experienced during the 1990s, more people were utilizing the existing roadway system and, on average, they were driving more miles on that system. These two factors effectively compounded the congestion issues of the study area's roadway network.

CAMPO and the City of Austin frequently examine congestion of the area's existing roadway system and plan and program means of improving surface transportation in their respective areas. Recent analyses indicate that the areas experiencing the most congestion are focused in the Austin area, the most populated area of the study area. In the Austin area, surface transportation on both north-south and east-west axis is impacted by significantly congested intersections. In addition, north-south vehicular traffic through the Austin area appears to be impacted significantly by roadway congestion. This could be an important factor in that general aviation users located north of the downtown Austin area may experience significant congestion and traffic delays when accessing Austin-Bergstrom International Airport, located south of the city-center.

As congestion and traffic on the area's roadway system have increased, the ability of general aviation users to efficiently reach the general aviation airports that they utilize has been negatively impacted. Planning standards dictate that the market area of a general aviation airport is typically considered to include an area within a 30-minute drive time of that airport. As traffic congestion increases on roadway systems increases, the effective area of that 30-minute drive time circle is reduced, reducing the number of pilots, people, and businesses having adequate access to that facility. Future roadway improvements in the study area will be an important consideration when examining the ability of existing general aviation airports to fulfill the area's regional demand. In addition, the location of a potential new airport relative to existing and planned roadway systems will significantly impact its ability to serve important areas of under-served general aviation demand that may exist in the study area.

Programmed and Planned Roadway Improvements

The population of the study area has increased significantly over recent periods. The growing population and growing surface transportation needs have impacted the ability of the study area's existing roadway system to accommodate demand without significant amounts of congestion and traffic delay. Several planning agencies in the study area have developed plans to address surface transportation issues and improve the existing roadway systems and/or construct needed roads to better serve the area. The impact that planned and programmed roadway improvements in the study area may have on existing and potential new airports will be important in determining the ability of these airports to meet aviation demand.

As a means of identifying programmed and planned roadway improvement projects that may impact surface transportation in the study area, the following sources were examined:

- CAMPO Metropolitan Transportation Plan (MTP) 2025
- Unified Transportation Program (UTP)
- CAMPO Transportation Improvement Program (TIP)

Planned and/or programmed roadway improvements identified in the studies listed above will be summarized in following sections.

CAMPO Metropolitan Transportation Plan

CAMPO's Metropolitan Transportation Plan (MTP) 2025 is a planning guide that identifies transportation improvement projects through 2025. A Roadway Plan that identifies roadways that are significant with regards to regional mobility, moving traffic within and through the urban area, is included in the overall transportation plan. **Table 3-8** summarizes planned roadway improvements included in the MTP 2025.

Table 3-8
CAMPO 2025 Roadway Plan

Roadway	Segment	Existing 1997	Adopted 2025 Plan
IH 35	CR 111 - 3/4 miles south of Yarington Road	FWY 4-8	FWY 6-8
US 79	IH 35 (N) - CR 122	DMA 4- 6	DMA 6
US 183	Study Boundary - Lakeline Blvd.	UMA 4/DMA 4	DMA 6
	Lakeline Blvd. - Study Boundary (SE)	DMA 4-6/UMA 4	FWY 6-8
US 183 (A)	US 183 (N) - US 183 (S)	---	Toll PKY 6
US 290 (E)	IH 35 (N) - Study Area Boundary (E)	DMA 4	FWY 6/EXP 6
US 290 (W)	Study Boundary (W) - IH 35 (S)	UMA 4/DMA 4-6	FWY 6
SH 45 (N)	US 183 (N) - SH 130 (N)	UMA 4/DMA 4	Toll FWY 6
(Wilke Ln/Kelly Ln)	SH 130 (N) - FM 685	MA 2/0	DMA 6
(Wilke Ln/Kelly Ln)	FM 685 to Kelly Ln	---	DMA 4
SH 45 (S)	Loop 1 - US 183	---	PKY 4 /Toll PKY 4-6
SH 71 (E)	IH 35 (S) - Study Boundary (E)	DMA 4-6	FWY 6
SH 71 (W)	FM 3238 - US 290 W	DMA 4/UMA 4	DMA 6/FWY 6
SH 130	CR 111 - Study Boundary (S)	---	Toll PKY 6
Loop 360	US 183 (N) - US 290 (W)	DMA 4	EXP 6
FM 1431	Trails Ends Rd. - IH 35	MA 4/UMA 4	DMA 6
RM 2244	Cuernavaca Dr. - Loop 1	DMA 4/UMA 4	DMA 6

Source: CAMPO 2025 Transportation Plan
Note: This data only reflects a summary of the Roadway Plan, more detailed information is available in the CAMPO 2025 Transportation Plan.

CAMPO's 2025 Transportation Plan uses the following abbreviations and general descriptions for roadway classifications:

- Freeway (FWY) - Fully access controlled roadways with grade separation at interchanges. Ramp movements on and off the facility are accomplished by ramps connecting to frontage roads. Access points are limited to major facility crossings.

- Parkway (PKY) - Through travel lanes are similar in characteristics to Freeways, but continuous frontage roads are not normally provided. Access is provided by grade separated interchanges and ramps at major crossings. Whenever possible, landscape treatments and scenic easements are provided.

- Expressway (EXPY) - High volume, high capacity roadways with widely spaced at-grade signalized intersections. Little or no direct access from frontage development or local roads along the facility with right turns in and out when access is available. Major street crossings are grade separated.

- Toll Road (TOLL) – Toll roads are freeways or parkways on which the user pays to drive on the facility. Tolling roads is one option for funding build major roadway projects without relying tax funds. The user fees are collected and used to pay the bonds issued for the construction of the roadway. Automated toll collection has greatly reduced the inconvenience for the roadway user.

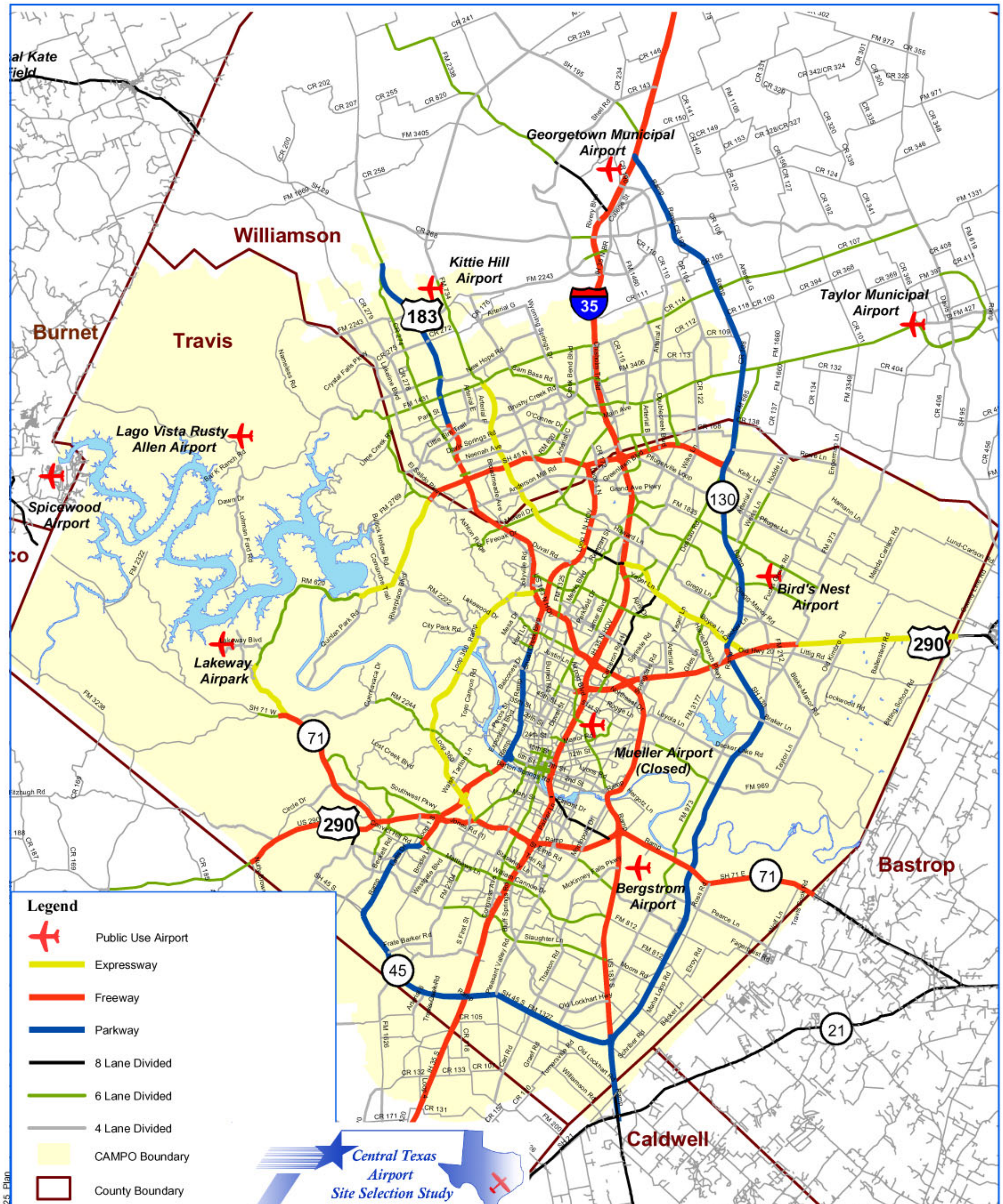
- Divided Major Arterial (DMA) - High volume surface roadways with high priority at intersections with all lower level facilities. Typically, signalization is provided at significant crossings. Flush, depressed or raised center median with left turn storage.

- Undivided Major Arterial (UMA) - Similar to Major Divided Arterials, but with no center median, normally due to right-of-way limitations. Limited left turn channelization at key crossing is provided wherever possible.

- Minor Arterial (MNR) - Secondary facility to meet local access and circulation requirements in addition to providing through movement. Typically, full movement access (left and right turns) is permitted along the route. Low priority is given at significant intersections.

- High-Occupancy Vehicle/High-Occupancy Toll Lane (HOV/HOT) - An alternative to widening major freeway facilities for general purpose travel, high-occupancy vehicle and high-occupancy toll (HOV/HOT) facilities are recommended for many of these routes to encourage higher vehicle occupancies and increase the person-carrying capacity of such corridors. Consideration of HOV lanes on these roadways should be given priority to encourage ridesharing and transit ridership, rather than encouraging additional single-occupancy vehicle (SOV) travel.

Table 3-8 summarizes roadway improvements planned for regionally significant roadways, ranging from improvements to 4-lane arterial roadways to improvements to freeways and expressways. The Roadway Plan identifies the specific roadway improvements identified in the plan, the existing number of lanes (as of 1997) for each roadway segment recommended to be improved, and the Year 2025 roadway cross section (in number of lanes). Year 2025 roadway cross-sections were developed by CAMPO based on area needs as well as fiscal constraints and social impact feasibilities. The Roadway Plan is shown for the CAMPO planning area which includes Travis County, the southern portion of Williamson County, and a small portion of Hays County. The planned roadway improvement projects identified in Table 3-8 are illustrated in **Exhibit 3-1**.



N
0 2.5 5 10 Miles

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Exhibit 3-1

CAMPO 2025 Roadway Plan

Wilbur Smith Associates
ENGINEERS PLANNERS ECONOMISTS

Major interstate highway improvements identified in the MTP include widening I-35 from 4 to 6 lanes between CR 111 and FM 3406 in the northern most segment of the CAMPO planning area (near Williamson County) and from 6 to 8 lanes between Slaughter Lane and FM 1327 toward the southern extent of the planning area near Hays County.

Major US Highway improvements include widening US 79 in the northern part of Travis County from Business Route IH 35 to CR 122 from four to six-lanes and upgrading US 290, both east and west of IH 35, to a fully access-controlled six-lane freeway with grade separated interchanges. Improvements along US 183 include upgrading it to freeway standards from Lakeline Boulevard in the northeast part of Travis County to SH 130 South and widening it from four to six lanes between FM 2243 and Lakeline Boulevard in the far northwestern part of Travis County.

Major State Highway improvements include upgrading SH 45 North from a four-lane roadway to a six-lane toll freeway and the construction of SH 45 South to a four/six-lane toll parkway. Other improvements include upgrading and widening of SH 71 East and West to a six-lane freeway and construction of SH 130 as a six-lane toll parkway, which will improve the north/south movement of traffic in Travis County.

Other major improvements identified in the plan include an upgrade of Loop 360 to a six-lane expressway, which is a high capacity roadway with little or no direct access from frontage development or local roads. As shown on Exhibit 3-1, there are numerous other significant roadway capacity improvements identified in the Transportation Plan. Many of these improvements include upgrading major and minor arterials from two/four-lane to four/six-lane arterials. The proposed projects and capacity enhancements identified in the CAMPO 2025 Roadway Plan are intended to improve regional mobility within the CAMPO planning area.

Unified Transportation Program

The Unified Transportation Program (UTP) serves as TxDOT's ten-year plan for transportation project development and construction. The plan includes a listing of projects with funding authorization and scheduled-to-be-awarded construction contracts, or let, in Fiscal Year 2002; projects scheduled-to-be-awarded construction contracts or let over the next three fiscal years; and listings of projects being developed for the next seven years. **Table 3-9** summarizes major highway capacity improvements listed in the UTP for those counties or areas not included in the CAMPO study area.

Table 3-9
UTP – Roadway Improvement Projects

County	Hwy No	From	To	Description
Category 3A - National Highway System – Mobility				
Bastrop	US 290	SH 95	FM 696	Widen to four lane divided rural section
Williamson	SH 195	Bell County line	IH 35	Widen to four lane divided rural
Category 12 - Strategic Priority				
Bastrop	SH 71	West of Hasler Boulevard	Colorado River	Construct frontage roads and grade separations

Source: 2002 Unified Transportation Program, Texas Department of Transportation

As shown, highway improvements in Bastrop County include widening US 290 to a four-lane divided facility improving movement of traffic through and to the Elgin area and construction of frontage roads and grade separations along SH 71. Highway improvements in Williamson County include widening SH 195 to a four-lane divided highway and improving access to IH 35. Other than these three projects, there are no other regionally significant transportation improvements in the areas outside of the CAMPO planning area.

CAMPO Transportation Improvement Program

CAMPO's Transportation Improvement Program (TIP) lists projects within the metropolitan area that are proposed for federal funding under the Transportation Equity Act of the 21st Century (TEA 21), which are consistent with the long range plan. Additionally, the TIP identifies state or locally funded projects that are regionally significant.

Summary of Planned Roadway Improvements

Planned and programmed roadway improvements identified in one or all the plans examined in this analysis will impact the study area's roadway transportation system through the study period. The potential impacts that roadway construction, improvement, and/or expansion may have on study area airports will be an important consideration in following phases of this study.

Registered Aircraft Owner Survey

A registered aircraft owners survey was conducted to gather additional information regarding characteristics of local aviation activity in the study area. Aircraft owners were asked to provide detailed information regarding their aircraft, its use, and their preferences and needs related to airport facilities. Important data collected through this survey process included identifying where aircraft owners live, where their aircraft are based, and the distance and length of time they travel to get to and from their base airport. This information provides insight into current tendencies of aircraft owners, and will provide supplementary information in the analysis of demand for a new general aviation airport in the study area.

Survey Results

In December, 2002, approximately 1,480 surveys were mailed to registered aircraft owners in Travis County and the six contiguous counties of Bastrop, Blanco, Burnet, Caldwell, Hays, and Williamson. Registered aircraft owner data was acquired through a commercially available database which had been updated in November, 2002. Included with each mailed survey was a cover letter that explained the purpose of the study and survey effort, and requested that completed surveys be returned by January 10, 2003, using the pre-paid postage provided. By January 23, 2003, 421 completed surveys had been returned. This represents a response rate of approximately 29 percent, relatively high for a survey effort of this sort. It should be noted that approximately 8 percent of the surveys that were mailed had been returned as a result of bad or insufficient address information.

Those aircraft owners responding to the survey indicated that they base their aircraft at airports throughout the study area, as well as in other areas of Texas. **Table 3-10** summarizes the responses of aircraft owners when asked where they base their aircraft.

Table 3-10
Registered Aircraft Owners Survey – Based Aircraft

Airport Name	Associated City	Number Based	% of Total Responses	Estimated Annual Operations
Austin-Bergstrom International Airport	Austin	53	12.7%	11,304
Bird's Nest Airport	Austin	2	0.5%	200
Lakeway Airpark	Austin	16	3.8%	3,040
Lago Vista Tx – Rusty Allen Airport	Lago Vista	7	1.7%	1,280
Kittie Hill Airport	Leander	25	6.0%	4,463
San Marcos Municipal Airport	San Marcos	60	14.4%	7,876
Spicewood Airport	Spicewood	16	3.8%	1,750
Taylor Municipal Airport	Taylor	15	3.6%	1,285
Georgetown Municipal Airport	Georgetown	104	24.9%	13,833
Lockhart Municipal Airport	Lockhart	26	6.2%	4,098
The Carter Memorial Airport	Luling	0	0.0%	0
Smithville Crawford Municipal Airport	Smithville	5	1.2%	375
Burnet Municipal – Kate Craddock Field Airport	Burnet	13	3.1%	1,570
Total – Study Area Airports		**342**	**82.0%**	**51,074**
Total – Airports Outside Study Area		**75**	**18.0%**	**18,700**

Source: Wilbur Smith Associates, Inc.

Survey data indicates that of the registered aircraft owners in the study area who responded to the survey, 342 or approximately 82 percent, base their aircraft at an airport in the study area. These pilots also estimated that they account for over 51,000 annual aircraft operations in the study area. Fourteen pilots responding to the survey indicated that they based their aircraft on private property or personal landing strips. The remaining pilots that responded to the survey based aircraft outside the study area. Breakaway-Cedar Park was the most common airport from outside the study area at which survey respondents based aircraft.

Registered aircraft owners were asked to provide the typical drive time that they experience when driving to and from their residence and the airport at which they based their aircraft. The results are summarized in **Table 3-11**.

Table 3-11
Registered Aircraft Owners Survey - Typical Drive Time

Drive Time	Total Responses	% of Total Responses
0-10 Minutes	86	20.8%
10-20 Minutes	75	18.2%
20-30 Minutes	87	21.1%
30-40 Minutes	82	19.9%
More than 40 Minutes	83	20.1%
Total	**413**	**100.0%**

Source: Wilbur Smith Associates, Inc.

Survey data indicates that there is a relatively equal distribution of responses in the different drive time ranges identified in the survey. For example, the percentage of respondents typically driving less than ten minutes to reach the airport is almost equal to the percentage of respondents driving more than 40 minutes. In most cases, it is expected that the number/percentage of respondents identifying a typical drive would decrease as the typical drive time increases. The results of this survey do not follow that pattern, indicating that relatively more aircraft owners in the study area must drive greater distances to reach the airport where their aircraft are based. A separate survey question identified that respondents drive, on average, 25 miles from their residence to reach the airport at which their aircraft is based.

In addition to typical drive times and distance, surveyed aircraft owners were also asked to identify the runway length that best serves their aircraft. Summary data regarding their responses are presented in **Table 3-12**.

Table 3-12
Registered Aircraft Owners Survey – Runway Length Preference

Runway Length Preference	Total Responses	% of Total Responses
Less than 4,000 feet	178	43.2%
4,000 feet	27	6.6%
4,500 feet	72	17.5%
5,000 feet	93	22.6%
5,500 feet	14	3.4%
6,000 feet	23	5.6%
6,500 feet	3	0.7%
7,000 feet	2	0.5%
Total	**412**	**100.0%**

Source: Wilbur Smith Associates, Inc.

It is important to note that the responses tend to reflect the characteristics of the aircraft fleet captured in the survey effort. For example, most aircraft owners identified in the database, and responding to the survey, indicated that they own small, single engine aircraft. The results of the survey reflect this characteristic by showing the approximately 50 percent of the respondents are best served by runways with a length of 4,000 feet or less. Survey results did indicate, however, that while approximately 33 percent of respondents indicated they are best served by a runway of 5,000-feet or greater, respondents in this group accounted for more than 50 percent of the annual aircraft operations identified in the study area. The results reinforce the common perception that while small aircraft tend to make up the vast majority of based aircraft in any area, their owners tend to perform fewer operations. In most cases, the minority of aircraft owners with larger aircraft tend to account for a disproportionately large percentage of the area's aircraft operations.

As residents of the study area, registered aircraft owners included in the survey effort are aware of changes to the area's general aviation airport system, specifically the recent closures of Robert Mueller Municipal Airport and Austin Executive Airpark. Many of those included in the survey were those forced to relocate their aircraft following the airport closures. To judge aircraft owners' satisfaction with the airport at which their aircraft are currently based, they were asked to indicate if they would be interested in relocating to a new general aviation airport if one was established in the study area. **Table 3-13** summarizes the responses of area registered aircraft owners.

Table 3-13
Registered Aircraft Owners Survey – Interest in New General Aviation Airport

Interested in Relocating to a New General Aviation Airport	Total Responses	% of Total Responses
No	75	18.0%
Maybe	135	32.5%
Yes	206	49.5%
Total	**416**	**100.0%**

Source: Wilbur Smith Associates, Inc.

As the results illustrate, almost 50 percent of the respondents indicated that they would be interested in relocating their aircraft to a new general aviation airport. An additional 33 percent indicated that they might be interested in relocating. While these responses should not be taken to reflect actual demand for a new airport, as owners' decisions to relocate will be impacted by a number of individual factors, the response does indicate a significant interest in the establishment of a new general aviation airport and willingness by area aircraft owners to consider relocating to it.

To further examine registered aircraft owners' interest in a new general aviation airport, additional questions related to a new facility were included in the survey. In the analysis that follows, only the responses of those aircraft owners that indicated that they are or might be interested in relocating to a new general aviation airport were examined. Those owners responding in this fashion were asked to identify the most important factor that they would consider when deciding whether to relocate to a new general aviation airport, the amount of time they would be willing to drive to reach the new airport, and facility needs or preferences. **Table 3-14** summarizes survey responses regarding the most important factor that aircraft owners would consider when deciding to relocate their aircraft.

Table 3-14
Registered Aircraft Owners Survey – Most Important Factor to Relocating Aircraft

Most Important Factor	Total Responses	% of Total Responses
Available facilities	21	6%
Cost (hangar, fuel, etc.)	99	29%
Location	210	62%
All	8	2%
Total	**338**	**100.0%**

Source: Wilbur Smith Associates, Inc.

Of those aircraft owners indicating an interest in relocating their aircraft to a new general aviation airport, the majority (62 percent) indicated that the location of the new airport relative to their residence would be the primary factor in their decision. Almost 30 percent of the respondents indicated the cost of operating at the new airport, such as hangar rental rates, fuel costs, etc., would be the most important factor.

The majority of aircraft owners indicating that they are or might be interested in relocating their aircraft to a new general aviation airport responded that the location of the new facility would be the most important factor in their decision-making process. **Table 3-15** summarizes the responses provided by aircraft owners when asked to indicate the amount of time that they would be willing to drive to reach a new general aviation airport from their residence.

Table 3-15
Registered Aircraft Owners Survey – Preferred Drive Time

Drive Time	Total Responses	% of Total Responses
0-10 min	7	2.1%
10-20 min	118	34.9%
20-30	154	45.6%
30-40	55	16.3%
over 40	4	1.2%
Total	**338**	**100.0%**

Source: Wilbur Smith Associates, Inc.

As the results indicate, approximately 83 percent of the respondents indicated that they would be willing to drive 30-minutes or less to reach a new general aviation airport. It is important to consider the difference between the survey results summarized in Table 3-15 and in Table 3-11. The typical actual drive time experienced by pilots was fairly equally distributed among the ranges included on the survey. Approximately 40 percent of the respondents indicated that they ***currently*** drive more than 30 minutes to reach the airport at which their aircraft is based.

Aircraft owners interested in relocating their aircraft to a new general aviation airport were also asked to identify the types of aviation facilities which they would prefer to have access to at a new general aviation airport. **Table 3-16** summarizes aircraft storage preferences, **Table 3-17** summarizes approach type preferences, and **Table 3-18** summarizes fuel availability preferences.

Table 3-16
Registered Aircraft Owners Survey – Preferred Storage Facilities

Preferred Storage – New General Aviation Airport	Total Responses	% of Total Responses
Hail Shed	1	0.3%
Community hangar	14	4.1%
Tiedown	10	2.9%
T-hangar	244	72.0%
Conventional	70	20.6%
Total	**339**	**100.0%**

Source: Wilbur Smith Associates, Inc.

Table 3-17
Registered Aircraft Owners Survey – Preferred Approach Type

Preferred Approach Type – New General Aviation Airport	Total Responses	% of Total Responses
Visual	100	29.6%
Non-precision	74	21.9%
Precision	164	48.5%
Total	**338**	**100.0%**

Source: Wilbur Smith Associates, Inc.

Table 3-18
Registered Aircraft Owners Survey – Preferred Fuel Availability

Preferred Fuel Availability – New General Aviation Airport	Total Responses	% of Total Responses
Mogas	3	0.9%
Avgas	310	91.4%
Jet A	13	3.8%
Both (Avgas and Jet A)	6	1.8%
None	7	2.1%
Total	**339**	**100.0%**

Source: Wilbur Smith Associates, Inc.

The results indicate that approximately 97 percent of the respondents that are interested in relocating to a new general aviation airport would prefer covered aircraft storage facilities, including community hangar, T-hangar, or conventional hangar facilities. The highest percentage of respondents, approximately 49 percent, indicated a preference for a precision approach. In addition, the vast majority, approximately 91 percent, indicated that access to Avgas would meet their needs.

Survey Conclusion

The response rate for the registered aircraft owners survey was significantly better than what is normally expected for similar mass-mail surveys. Approximately 29 percent of all surveys mailed were returned in complete and usable condition. Important findings from the survey effort include:

- Almost 25 percent of survey respondents based their aircraft at Georgetown Municipal Airport. Over 14 percent based aircraft at San Marcos Municipal Airport, and approximately 13 percent were based at Austin-Bergstrom International Airport. No more than six percent of survey respondents were based at any other general aviation airport in the study area or nearby.

- Over 60 percent of respondents indicated that their aircraft is used for business purposes.

- The typical driving time experienced by aircraft owners when driving from their residence to the airport at which their aircraft is currently based was equally distributed among the ranges identified in the survey. The average driving distance was almost 25 miles.
- Approximately 50 percent of survey respondents indicated that they are best served by a runway length of 4,000 feet or less. Almost 18 percent indicated that a length of 4,500 feet best serves their aircraft and another 23 percent indicated that 5,000 feet of runway is their preferred length.
- Almost 50 percent of survey respondents indicated that they would consider relocating their aircraft to a new general aviation airport. An additional 33 percent indicated that they might consider relocating

Survey responses provided by those that indicated an interest in relocating to a new general aviation airport provided the following information regarding the new facility and their potential relocation:

- The majority of respondents indicated that the location of the new airport would be the most important factor in their decision to relocate their aircraft
- Approximately 83 percent of survey respondents indicated that they would be willing to drive 30-minutes or less to reach the new airport
- Respondents indicated that they would prefer to have access to covered aircraft storage, a precision approach, and avgas fuel facilities.

Survey results were further examined to gather airport-specific data. Airport-specific survey results for relevant data are summarized in **Table 3-19**.

Table 3-19
Registered Aircraft Owners Survey – Relevant Results by Airport

			Consider Relocating to New Airport			
Airport Name	**Respondents**	**Average Driving Distance**	**Yes (%)**	**Maybe (%)**	**Yes and Maybe %**	**No (%)**
Austin-Bergstrom International Airport	52	18.8	79%	21%	100%	0%
Bird's Nest Airport	Insufficient survey response					
Lakeway Airpark	16	9.3	44%	31%	75%	25%
Lago Vista Tx – Rusty Allen Airport	6	17.9	17%	50%	67%	33%
Kittie Hill Airport	24	18.8	29%	63%	92%	8%
San Marcos Municipal Airport	60	29.8	60%	20%	80%	20%
Spicewood Airport	16	25.5	56%	19%	75%	25%
Taylor Municipal Airport	15	19.5	60%	40%	100%	0%
Georgetown Municipal Airport	104	18.0	52%	37%	90%	11%
Lockhart Municipal Airport	26	24.4	50%	27%	77%	23%
The Carter Memorial Airport	Insufficient survey response					
Smithville Crawford Municipal Airport	5	20	20%	60%	80%	20%
Burnet Municipal – Kate Craddock Field Airport	13	23.8	54%	15%	69%	31%

Source: Wilbur Smith Associates, Inc.

As shown in Table 3-19, results indicate that aircraft owners based at San Marcos Municipal Airport encounter the longest average driving distance, approximately 30 miles. Respondents at five other airports indicated that they drive an average distance of approximately 20 miles or greater to reach the airport at which their aircraft is based. Survey results indicate that the majority of respondents at each airport answered "yes" or "maybe" when asked in they would be interested in relocating their aircraft to a new general aviation airport in Central Texas.

Summary

The overview of demographic trends indicate that market area will continue to experience exceptional growth. While the entire area will grow, Travis and Williamson Counties will experience the majority of the growth. Major transportation improvements are planned to improve access throughout this area.

CHAPTER FOUR
NATIONAL AND STATE AVIATION TRENDS

The aviation industry and general aviation activity, especially in the Central Texas region, have experienced significant changes over the last 20 years. At the national level, fluctuating trends regarding general aviation usage and economic upturns/downturns resulting from the nation's business cycle have all impacted general aviation demand. At the local level, recent closures of general aviation airports in the study area, the area's ongoing transition to a high-tech economy, and the rapid demographic and economic growth experienced in the study area have also impacted general aviation demand. This chapter will examine general aviation trends, and the numerous factors that have influenced those trends, in the U.S. and the State of Texas.

General aviation trends will be summarized in the following sections:

- National General Aviation Trends
- Texas General Aviation Trends

Recent trends, both national and local, will be important considerations in the development of the regional demand projections in Chapter Five.

National General Aviation Trends

An understanding of recent and anticipated trends within the general aviation industry is important when assessing regional demand in the Central Texas study area. National trends can provide insight into the potential future of aviation activity and anticipated facility needs within the seven-county study area of this study. It is important to note that some aviation trends examined in this analysis will undoubtedly have a greater effect on regional demand in the study area than others. It is also possible that some anticipated general aviation trends might have little or no pronounced impact on regional demand in the Central Texas region.

Data sources that were examined and used to support this analysis of national general aviation trends included the following:

- Federal Aviation Administration, *FAA Aerospace Forecasts, Fiscal Years 2002-2013*
- General Aviation Manufacturers Association (GAMA), *General Aviation Statistical Databook*
- National Business Aircraft Association (NBAA), *NBAA Business Aviation Fact Book, 2002*
- General Accounting Office, *General Aviation – Status of the Industry, Related Infrastructure, and Safety Issues, 2001*
- The Commission On The Future Of The U.S. Aerospace Industry, *Final Report, December 2002*
- Netjets, Inc.
- Honeywell Corporation, *2002 Business Aviation Outlook*

Data from these sources regarding historic and anticipated trends in general aviation will be summarized in the following sections of this report:

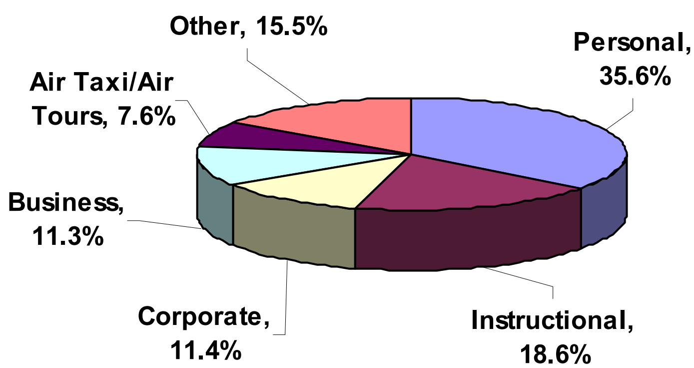
- General Aviation Overview
- General Aviation Industry
- Historic General Aviation Aircraft Shipments and Billings
- Business Use of General Aviation
- Non-Business Use of General Aviation
- FAA Aerospace Forecasts
- Summary of National General Aviation Trends

Historic and anticipated trends related to general aviation will be important considerations in developing regional forecasts of general aviation demand for Central Texas.

General Aviation Overview

General aviation aircraft are defined as all aircraft not flown by commercial airlines or the military. General aviation activity is divided into six use categories, as defined by the FAA. The use categories and percentage of hours flown, a measure of overall activity, are summarized in **Exhibit 4-1**.

Exhibit 4-1
General Aviation Use Categories and Percentage of Hours Flown



As Exhibit 4-1 indicates, personal use and instructional use of general aviation aircraft are the two largest components of general aviation activity.

There are more than 18,300 public and private airports located throughout the United States, as reported by the FAA. More than 3,300 of these airports are included in the National Airport System. Commercial service airports, those that accommodate scheduled airline service, represent a relatively small portion (538 or roughly 16%) of the airports in the National Airport

System. General aviation airports, including relievers, comprise more than 2,800 facilities within the National Airport System. More than 15,000 additional airports, both private and public use, supplement those airports that are included in the National Airport System. **Exhibit 4-2** depicts the approximate distribution of public use airports throughout the United States.

Exhibit 4-2
Public Use Airports

Source: Aircraft Owners and Pilots Association (AOPA)

The number and distribution of public use airports available to general aviation users, as depicted in Exhibit 4-2, provides a valuable transportation and economic resource to local communities, businesses, and individuals throughout the country.

General Aviation Industry

A pronounced decline in the general aviation industry began in 1978, and lasted throughout most of the 1980s and into the mid-1990s. This decline resulted in the loss of over 100,000 manufacturing jobs and a drop in aircraft production from about 18,000 aircraft annually to only 928 aircraft in 1994 and a dramatic drop in the number of new student pilots.

Contributing to the decline in general aviation during this period was the increasing number of liability claims on aircraft manufacturers, the loss of Veterans Benefits that covered many costs associated with student pilot training, and the recessionary economy. Lawsuits arising from aircraft accidents resulted in dramatic increases in aircraft manufacturing costs. Manufacturers estimated that these liability claims contributed to approximately 30 percent of the cost of a new aircraft.

Enactment of the General Aviation Revitalization Act (GARA) of 1994 provided significant relief to the aviation industry. This Act established an 18-year Statute of Repose on liability related to the manufacture of all general aviation aircraft and their components where no time limit was previously established. GARA spurred manufacturers including Cessna and Piper Aircraft to resume production of single-engine piston general aviation aircraft. While enactment of GARA stimulated production of single-engine piston aircraft, the cost of these aircraft has continued to increase. The relatively high cost of new general aviation aircraft has contributed to significantly lower levels of aircraft production from those experienced during the 1960's and 1970's when the annual numbers of aircraft manufactured were commonly between 10,000 and 18,000 new aircraft per year.

Some positive impacts the Act has had on the general aviation industry are reflected in recent national statistics. Since 1994, statistics indicate an increase in general aviation activity, an increase in the active general aviation aircraft fleet, and an increase in shipments of fixed-wing general aviation aircraft.

Most recently, however, the terrorist attacks of September 11, 2001 and the recessionary national economy have had a dampening impact on these positive general aviation industry trends. Significant restrictions were placed on general aviation flying following September 11th, which resulted in severe limitations being placed on general aviation activity in many areas of the country. Most of these restrictions have now been lifted and business and corporate general aviation have experienced some positive gains resulting from additional use of general aviation aircraft for business and corporate travel tied in part to new security measures implemented at commercial service airports and the increased personal travel times that have resulted.

The terms business and corporate aircraft are often used interchangeably, as they both refer to aircraft used to support a business enterprise. FAA defines business use as "any use of an aircraft (not for compensation or hire) by an individual for transportation required by the business in which the individual is engaged." The FAA defines corporate/executive transportation as "any use of an aircraft by a corporation, company or other organization (not for compensation or hire) for the purposes of transporting its employees and/or property, and employing professional pilots for the operation of the aircraft." Regardless of the terminology used, the business/corporate component of general aviation use is one that has experienced significant recent growth.

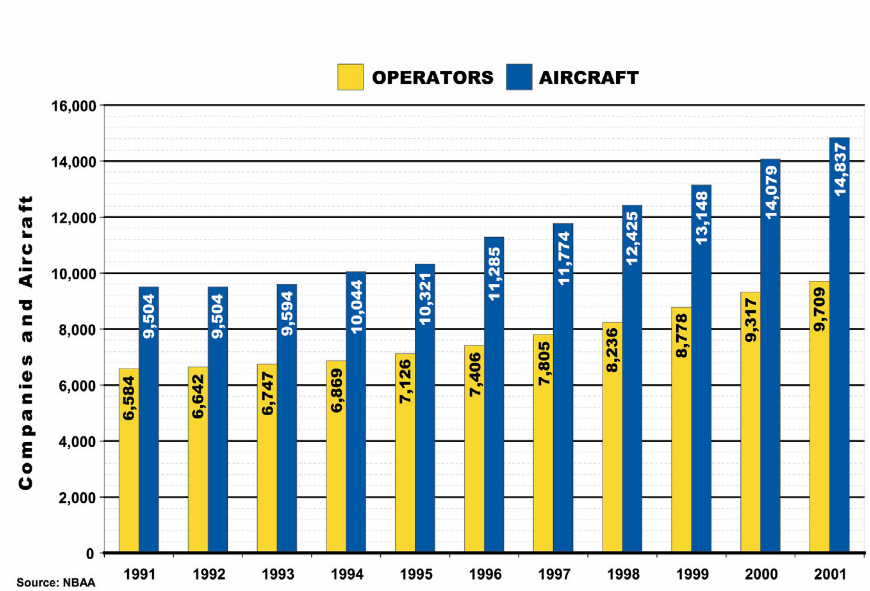
Increased personnel productivity is one of the most important benefits of using business aircraft. Companies flying general aviation aircraft for business have control of their travel. Itineraries can be changed as needed, and the aircraft can fly into destinations not served by scheduled airlines. Business aircraft usage provides:

- Employee time savings
- Increased enroute productivity
- Minimized time away from home

- Enhanced industrial security
- Enhanced personal safety
- Management control over scheduling

Businesses and corporations have increasingly employed business aircraft in their operations. NBAA statistics depicted in **Exhibit 4-3** show the growth in the number of companies operating general aviation aircraft and the number of aircraft operated by them for business use.

Exhibit 4-3
General Aviation Turbine Aircraft Growth 1991-2001

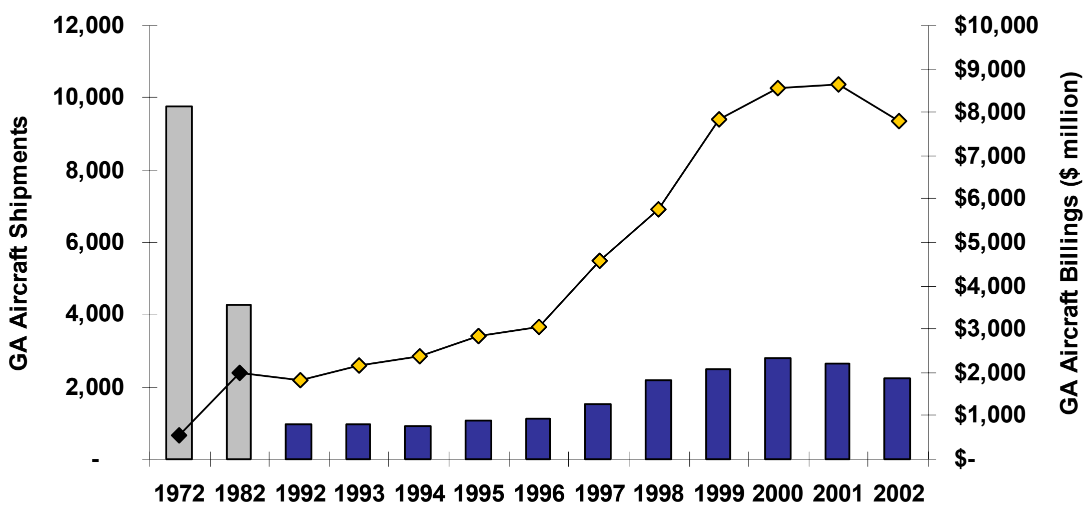


As Exhibit 4-3 indicates, the number of companies using business aircraft has increased from approximately 6,600 in 1991 to 9,700 in 2001. Businesses have also expressed growing interest in corporate and fractional aircraft ownership and charter services to serve their air travel needs because of safety concerns and time savings.

Historic General Aviation Aircraft Shipments and Billings

An important indicator used to measure the health of general aviation in the United States is general aviation aircraft shipments and billings. General aviation aircraft shipments represent new general aviation aircraft that move from the production line to the active general aviation aircraft fleet. General aviation aircraft billings represent the cost of those new aircraft shipments. GAMA tracks and reports total shipments and billings of general aviation aircraft. Historic general aviation shipment and billing statistics for aircraft manufactured in the United States are presented in **Exhibit 4-4**.

Exhibit 4-4
General Aviation Aircraft Shipments and Billings



Source: General Aviation Manufacturers Association

Data from 1972 and 1982 are included to provide perspective on the gross number of historic shipments in those periods relative to more recent years. Following consistent growth since 1994, recent GAMA statistics indicate a decline in aircraft shipments from relative highs reached in 2000. The economic recession experienced since 2001 and the terrorist attacks of September 11, 2001 are factors that may have led to the overall decline in general aviation aircraft shipments and billings.

While the gross number of aircraft shipments has experienced declines in 2001 and 2002, it is important to note that the proportion of those shipments that were business jets has grown. The recent growth in this segment can be attributed to increased business use of aircraft and a desire by corporations to have greater control over business travel, both through fractional ownership arrangements and/or traditional corporate flight departments. Business jets are high-performance general aviation aircraft, with correspondingly high acquisition costs, that require airport facilities of a relatively higher development standard to meet their needs.

GAMA also tracks total billings to both domestic and international customers for general aviation aircraft manufactured in the United States. As illustrated in Exhibit 4-4, statistics indicate that while aircraft shipments have increased since 1992, the billings (or cost) associated with those aircraft shipments have increased much more significantly, more than quadrupling over the period. This is another factor that indicates the growing sophistication of the new aircraft entering the general aviation fleet.

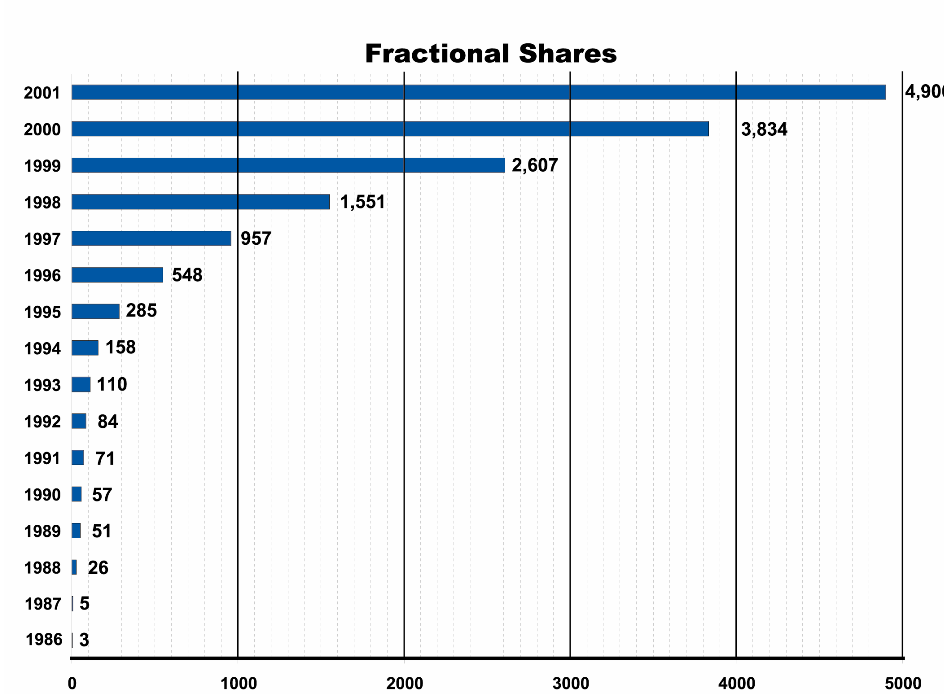
Business Use of General Aviation

Business aviation is one of the fastest growing facets of general aviation. Companies and individuals use aircraft as a tool to improve their businesses efficiency and productivity. Many of the nation's employers who use general aviation are members of the National Business Aircraft Association (NBAA). The NBAA's Business Aviation Fact Book 2002 indicates that approximately 71 percent of all Fortune 500 businesses operate general aviation aircraft and 89 of the Fortune 100 companies operate general aviation aircraft.

Business use of general aviation aircraft ranges from small, single-engine aircraft rentals to multiple aircraft corporate fleets supported by dedicated flight crews and mechanics. General aviation aircraft use allows employers to transport personnel and air cargo efficiently. Businesses often use general aviation aircraft to link multiple office locations and reach existing and potential customers. Business aircraft use by smaller companies has escalated as various chartering, leasing, time-sharing, interchange agreements, partnerships, and management contracts have emerged.

Fractional ownership arrangements have also experienced rapid growth. NBAA estimated that 2,591 companies used fractional ownership arrangements in 1999; by 2000 that number had grown to 3,694 companies, representing growth of over 40 percent in a single year. NBAA statistics show that the number of companies operating business aircraft increased from 6,584 in 1991 to 9,709 in 2001, an increase of approximately 47 percent. **Exhibit 4-5** depicts the growth in fractional aircraft ownership from 1986 through 2001. In addition, statistics indicate that the number of airplanes in the fractional aircraft fleet has also experienced strong growth over recent years. For instance, during 2001, the number of active aircraft in the fractional ownership fleet grew from 560 to 668 according to NBAA, representing a growth of almost 20 percent in a single year.

Exhibit 4-5
Growth of Fractional Ownership Shares



Source: *NBAA Aviation Fact Book, 2002*

The principal players in the fractional jet ownership market include CitationShares, NetJets, Bombardier Flexjet and the Flight Options/Travel Air operations. NetJets, the industry leader in fractional aircraft ownership, has purchased aircraft totaling more than $19 billion in value in the last six years alone. As of December 2002, the company had a fleet of 508 aircraft with an additional 821 aircraft on order.

Honeywell Aerospace has estimated that the fractional aircraft operators represent roughly 45 percent of the total current backlog of aircraft orders of the major, non-commercial airframe manufacturers. Light business jets, including the Bombardier Learjet 31, Cessna Citation Ultra and Raytheon Beechjet, account for almost 36 percent of the combined fractional jet fleet. Fractional shares in expensive, large cabin, ultra long-range business jets such as the Gulfstream IV/V and Global Express have been depressed and the operators have held back on incorporating these aircraft into their fleets in large numbers.

Other new, growing, segments of the business aircraft fleet mix include business liners and ultralight jets. Business liners are large business jets, such as the Boeing Business Jet and Airbus ACJ, that are reconfigured versions of passenger aircraft flown by large commercial airlines. Ultralight jets are a relatively new category of aircraft that includes the Adam A-700, Eclipse 500, Safire S-26, and Cessna Mustang. These are small, six seat jets that cost substantially less than typical business jet aircraft and have been labeled as “personal jets”.

Ultralight jet aircraft represent a significant departure from the cost of previously available jet aircraft. The Eclipse 500 is targeted to have a purchase price of less than $900,000 and has experienced significant interest with orders for more than 1,300 aircraft and non-refundable deposits totaling $65 million. The Cessna Citation Mustang is significantly more expensive with a price estimated around $2.25 million. The Mustang currently appears to be the only one of these aircraft that is a "sure" thing as it is a derivative of the Citation family. All of the others represent new aircraft that may or may not reach the general aviation market. **Exhibit 4-6** depicts examples of ultralight jet aircraft and their general design.

Exhibit 4-6
Examples of Ultralight Jet Aircraft

Adam A-700

Safire S-26

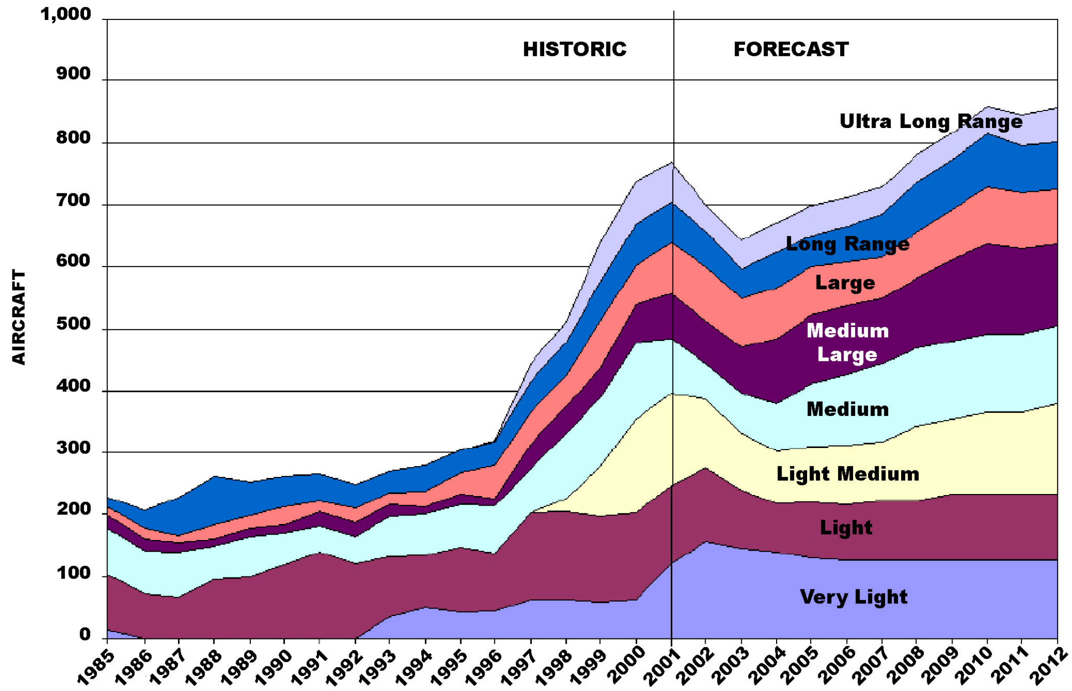
Citation Mustang

Eclipse 500

The Eclipse 500 has experienced performance problems related to the 80 pound engines originally intended for use on the aircraft. Actual flight-testing revealed that these engines were not powerful or durable enough to meet desired performance standards. The Eclipse company ended its association with Williams International, the builder of the original engines, and has now contracted with Pratt & Whitney Canada. Preliminary performance data for the replacement powerplants indicate that the new engines should increase the maximum cruise speed and useful load of the aircraft while minimally decreasing its range. The impact on the potential market for the aircraft remains to be seen.

Business aviation is projected to experience substantial additional growth in the future. The Honeywell Business Aviation Outlook projects that more than 7,600 new business aircraft will be delivered between 2003 and 2012, excluding business liners and ultralight jets. **Exhibit 4-7** depicts the forecast distribution of aircraft deliveries by type through 2012, as projected by Honeywell.

Exhibit 4-7
Projected Turbofan Aircraft Deliveries by Aircraft Type



Source: *Honeywell Aviation Outlook, 2002*
Notes: Long Range and Ultra Long Range = Falcon 900EX, Falcon 900C, Global Express and Gulfstream IV-SP
Large =Challenger 604, Falcon 2000, Falcon 2000EX and Legacy
Medium and Medium-Large = Citation Sovereign, Gulfstream G100, Hawker 800 and Learjet 60
Light and Light Medium = Beechjet 400A, Citation Bravo, Citation Encore, Citation Excel, Learjet 31A, Learjet 40 and Learjet 45/45XR
Very Light = Cessna CJ1 and CJ2, Beechcraft Premier I, and the Sino-Swearingen SJ30-2

The future of the ultralight jet segment of the business aircraft market appears extremely promising, assuming aircraft manufacturers can overcome the technological hurdles associated with the powerplants proposed for this category of aircraft. More than thirteen percent of the traditional corporate flight departments knowledgeable about ultralight jets expressed a strong probability of purchasing these aircraft for their corporate fleets, according to the survey conducted by Honeywell for their 2002 Business Aviation Outlook. The respondents indicated that ultralight jet purchases would be used by approximately 40% of the flight departments to replace turboprops, 20% to replace very light and light jets, and the remainder would represent additions to the corporate fleet.

Non-Business Use of General Aviation

This segment of general aviation activity represents personal and pleasure flying. Even more so than other segments, this segment of general aviation continues to be impacted by changing economic and social conditions. Constraints associated with personal and pleasure flying relate principally to the high operating costs and purchase prices of new general aviation single engine piston aircraft. These constraints are exacerbated by lifestyle changes, which were pointed out in the General Accounting Office (GAO) report on the Status of the Industry, Related Infrastructure, and Safety Issues.

Competing leisure-time activities have had a dampening effect on general aviation activity, particularly when compared to the increasing costs associated with general aviation flying. In addition, other lifestyle changes related to personal expectations may have a negative impact on the potential for significant growth in the personal and pleasure flying segment. Data presented in the General Aviation Manufacturers Association (GAMA) Statistical Databook note the average age of the aircraft fleet, including single-engine piston aircraft. **Table 4-1** presents the data relative to the age of the aircraft fleet in 1999, as compiled by GAMA.

Table 4-1
Average Aircraft Age by Type

Aircraft Type	Engine Type	Seats	Average Age in Years
Single Engine	Piston	1-3	28
		4	32
		5-7	25
		8+	43
	Turboprop	All	10
	Jet	All	27
Multi-Engine	Piston	1-3	21
		4	28
		5-7	31
		8+	30
	Turboprop	All	19
	Jet	All	16
All Aircraft			27

Source: General Aviation Manufacturers Association, *Statistical Databook*

A review of this table shows that at that time, the average age of single-engine piston aircraft ranged between 25 and 43 years old. Americans have a propensity to acquire the most up-to-date products. These statistics might tend to dissuade today's consumer from purchasing an aircraft, given our desire for convenience and reliability.

The GAO Report also noted that the cost of a single-engine piston aircraft increased from $25,000 in 1975 to $112,000 in 1990, representing more than a doubling of cost in constant dollar terms. In January 2003, the list price of a Cessna Skyhawk, a representative single-engine piston aircraft, illustrated in **Exhibit 4-8**, with standard equipment was $155,000.

Exhibit 4-8
Cessna Skyhawk

Adding the standard avionics package increases the price of the Cessna Skyhawk to almost $165,000. It is likely that many potential aircraft purchasers have simply opted for alternative or competing uses of their income given the choice of purchasing a new aircraft with an entry-level price significantly exceeding $100,000 or a used aircraft with an average age exceeding 25 years.

In addition, public accessibility to general aviation was a relatively new concept 30-40 years ago, and represented a different and challenging type of leisure pursuit. Today, the aviation industry is significantly more mature and flying is not the “cutting-edge” concept it was in earlier years. The “newness” of personal and pleasure flying has waned over the years as it has become more commonplace. The development of commercial aviation, which provides significantly greater choices for travel than it did 30-40 years ago, has also had an impact on personal and pleasure flying. Many “pioneer” aircraft owners purchased an aircraft in order to go whenever and wherever they desired. With the expansion of the airline industry, particularly regional carriers and the significant decline in airfares resulting from airline deregulation, the cost of commercial travel versus personal travel on a private aircraft has made private aircraft ownership less compelling.

The recent growth in sport aviation, a component of general aviation activity exemplified by ultra-light aircraft, is also changing the concept of recreational flying. Sport aviation aircraft typically have substantially lower capital investment and operating costs. It is likely that this relatively new segment of general aviation has supplanted or perhaps, more likely been substituted for the Cessnas and Pipers of the 1960’s and 70’s. When taken together, all of these changes have contributed to the slow-down in general aviation activity associated with personal and pleasure flying. It is likely that this segment of the market has now achieved equilibrium. Therefore, it is expected that personal and pleasure flying will see limited growth in the future.

The advancing age of the general aviation fleet does present a potential business opportunity within the personal and pleasure flying segment in the future. The high average age of the general aviation fleet would tend to suggest there could be a substantial market for new general aviation aircraft if the manufacturers can bring new aircraft to market at reasonable prices. More to the point, as time goes by; aircraft replacement will become more of a necessity in the future. The question is whether viable replacement aircraft alternatives will be available.

FAA Aerospace Forecasts

On an annual basis, the FAA publishes aerospace forecasts that summarize anticipated trends in all components of aviation activity. Each published forecast revisits previous aerospace forecasts and updates them after examining the previous year's trends in aviation and economic activity. Many factors are considered in the FAA's development of aerospace forecasts, some of the most important of which are U.S. and international economic forecasts and anticipated trends in fuel costs. FAA aerospace forecasts generally provide one of the most detailed analyses of historic and forecasted aviation trends and provide the general framework for examining future levels of aviation activity for the nation as well as in specific states and regions.

Examples of measures of national general aviation activity that are monitored and forecasted by the FAA on an annual basis include the following:

- Active Pilots
- Active Aircraft Fleet
- Active Hours Flown

Historic and projected activity in each of these categories will be examined in the following sections. Data presented is based on the most recent available data, contained in *FAA Aerospace Forecasts, Fiscal Years 2003-2014***.**

Active Pilots

Active pilots are defined by the FAA as those persons with a pilot certificate and a valid medical certificate. **Table 4-2** summarizes historic and projected U.S. active pilots by certificate type.

Table 4-2
Historic and Projected U.S. Active Pilots by Type of Certificate

Certificate Type	1997 Actual	2002 Estimate	2014 Projection	Compound Annual Growth Rate 1997-2002	Compound Annual Growth Rate 2002-2014
Students	96,101	85,991	110,660	-2.2%	2.1%
Recreational	284	318	340	2.3%	0.6%
Private	247,604	260,845	290,550	1.0%	0.9%
Commercial	125,300	137,504	162,600	1.9%	1.4%
Airline Transport	130,858	147,104	182,600	2.4%	1.8%
Rotorcraft only	6,801	7,770	8,600	2.7%	0.8%
Glider only 2/	9,394	21,826	22,380	18.4%	0.2%
TOTAL	**616,342**	**661,358**	**777,730**	**1.4%**	**1.4%**
Instrument Rated 1/	297,409	317,389	385,850	1.3%	1.6%

Source: *FAA Aerospace Forecasts, Fiscal Years 2003-2014*
1/ Instrument rated pilots should not be added to other categories in deriving total
2/ In March 2001, the FAA Registry changed the definition of this category. Approximately 13,000 pilots were added to this category.

As shown in Table 4-2, the FAA projects steady growth in the active pilot population through 2014. Total active pilots are projected to increase from approximately 661,400 in 2002 to approximately 777,730 by 2014, representing a compound annual growth rate (CAGR) of approximately 1.4 percent, matching the CAGR experienced between 1997 and 2002. Through 2014, the following pilot types are projected to experience the greatest CAGR, student pilots (2.1 percent), airline transport (1.8 percent), and commercial pilots (1.4 percent). Over the same period, the number of active private pilots is projected to grow by approximately 30,000 pilots, representing a CAGR of approximately 0.9 percent. It is important to note that instrument rated pilots within the active pilot population are also projected to experience relatively strong growth through 2014.

The increasing sophistication of general aviation pilots, as illustrated by the increase in instrument rated pilots, is an important trend in general aviation. The General Accounting Office (GAO) report on the Status of the Industry, Related Infrastructure, and Safety Issues noted an increase in the number of private pilots and the percentage of those pilots with an instrument rating. The report discussed the higher level of commitment to flying that the increasing number of instrument rated pilots tends to reflect. Another factor that could affect the numbers of instrument rated pilots is the changing airspace environment.

Historic national population trends reflect a net migration of the population towards urban areas, resulting in congestion on the ground and in the air. A direct result of this congestion has been the implementation of terminal control areas (TCA's) in many of our major metropolitan areas. This has had the effect of requiring more sophistication of both the pilot and the aircraft when transitioning these areas. Many private pilots have upgraded to instrument ratings in order to avoid the inconvenience associated with diverting around or under the TCA's. Increasing future congestion and the proposed new technologies under consideration to relieve this congestion are likely to further contribute to growing numbers of instrument rated pilots.

Data from these sources indicate that while the number of pilots is expected to experience moderate growth over the FAA's projection period, it is anticipated that the pilots will become more highly trained, and capable of operating more advanced aircraft.

Active Aircraft Fleet

The FAA tracks the number of active general aviation aircraft in the U.S. fleet annually. Active aircraft are those aircraft currently registered and flying at least one hour during the year. **Table 4-3** summarizes recent active aircraft trends as well as FAA projections of future active aircraft, by aircraft type.

Table 4-3
Historic and Projected U.S. Active General Aviation Fleet Mix

Aircraft Type	1997 Actual	2002 Estimate	2014 Projection	Annual Rate of Change 1997-2002	Annual Rate of Change 2003-2014
Single-engine piston	140,038	144,500	149,600	0.6%	0.3%
Multi-engine piston	16,017	18,240	17,810	2.6%	-0.2%
Turboprop	5,619	6,600	8,020	3.3%	1.6%
Jet	5,178	8,000	12,300	9.1%	3.6%
Rotorcraft	6,785	6,800	7,390	0.0%	0.7%
Sport Aircraft 1/	NA	NA	6,200	NA	NA
Other 2/	18,772	26,900	28,170	7.5%	0.4%
TOTAL	**192,414**	**211,040**	**229,490**	**1.9%**	**0.7%**

Source: *FAA Aerospace Forecasts, Fiscal Years 2003-2014*
Note: 1/ Sport aircraft are a new aircraft category that includes aircraft such as ultralights
2/ Includes aircraft classified by the FAA as experimental and other

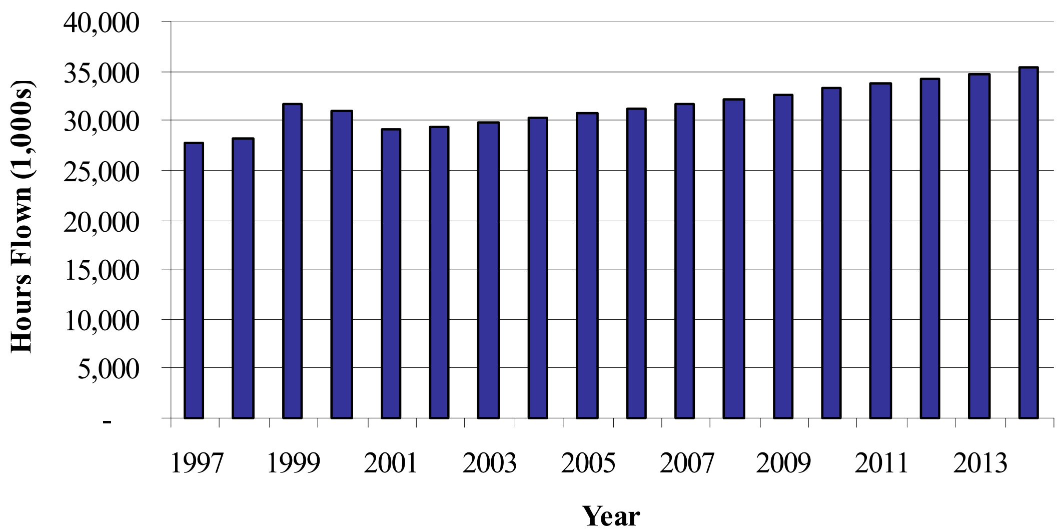
As shown in Table 4-3, nearly all areas of general aviation aircraft experienced growth between 1997 and 2002. Total active aircraft increased at a CAGR of 1.9 percent over the last five years. Jet aircraft experienced the largest growth, up over 9 percent per year on average between 1997 and 2002. The active general aviation aircraft fleet is anticipated to increase at a lower rate over the projection period, from 211,040 aircraft in 2001 to 229,490 in 2013, representing an average annual growth rate of approximately 0.7 percent, based on estimates in the FAA Aerospace Forecasts, Fiscal Years 2003-2014. This lower rate of projected growth is due primarily to the recent downturn in the economy and the anticipated retirement of older single engine and multi-engine aircraft from the active fleet.

One of the most important trends identified by the FAA in these forecasts is the relatively strong growth anticipated in active general aviation jet aircraft. This trend illustrates a movement in the general aviation community toward higher-performing, more demanding aircraft. Growth in general aviation jet aircraft is projected to significantly outpace growth in all other segments of the general aviation aircraft fleet through the projection period.

Active Hours Flown

Hours flown is another measure used by the FAA to measure and project general aviation activity. Hours flown in general aviation aircraft were at a 16-year low in 1994, but experienced a strong increase between 1994 and 1999. Hours flown fell slightly over the during 2000 and 2001, but are expected to rebound during the projection period. **Exhibit 4-9** depicts general aviation hours flown from 1997 through 2002 as well as projected hours flown through 2014.

Exhibit 4-9
Historic and Projected Total U.S. General Aviation Hours Flown



Source: FAA Aerospace Forecasts, Fiscal Years 2003-2014

As presented by the FAA, the CAGR of hours flown over the projection period is approximately 1.5 percent. Compared to the projected average annual growth rate of the general aviation active fleet, approximately 0.7 percent, the projected increase in hours flown represents anticipated increases in aircraft utilization. Hours flown by general aviation aircraft are estimated to reach approximately 35.3 million by 2013, compared to 29.5 million in 2002.

Summary of National General Aviation Trends

The cyclical nature of general aviation activity is illustrated in the historic data presented in this analysis. While general aviation activity and active aircraft experienced rebounded growth during the mid and late-1990s, the terrorist attacks of 2001 and the economic downturn dampened activity over the last several years. FAA projections of general aviation activity, including active pilots, active aircraft, and hours flown, all show varied growth through the forecast horizon of 2014. Following stalled growth and some declines during 2001 and 2002, most components of general aviation activity are projected to rebound and soon surpass previous activity levels. An important national trend that has the potential to impact general aviation in Central Texas is the growing proportion of jet aircraft in the active general aviation fleet and the growing sophistication of both active pilots and aircraft. The ability of Central Texas to accommodate growing activity by general aviation jet aircraft will be an important consideration.

Texas General Aviation Trends

Aviation activity at the State level is not only impacted by national economic and aviation trends, but it is also directly linked to the health of the Texas economy. Many factors influence the use of general aviation aircraft by Texas residents and businesses. These local factors may result in Texas aviation trends that are divergent from trends identified on the national level. To better understand general aviation trends in the State of Texas, the Texas Airport System Plan Update 2002 (TASP), completed by the Texas Department of Transportation, was examined.

The TASP's examination of general aviation activity in the State will be summarized in the following sections:

- Texas Economic Trends
- Texas General Aviation Trends
- TASP Aviation Activity Forecasts

Trends affecting general aviation at both the national and State level will be important considerations in developing the regional projections of demand for the Central Texas Airport Site Selection Study.

Texas Economic Trends

Economic trends tend to impact general aviation activity at both the individual and corporate level. For example, increases in population, employment, and personal income are all factors that lead to an increased number of individuals having disposable income to use towards general aviation pursuits, such as getting a pilots license or purchasing an aircraft. At the corporate level, economic upturns often lead to increased corporate sales and profits. Many corporate executives utilize general aviation aircraft to expand their businesses' reach during cyclical upswings, thereby generating additional sales and profits. During periods of economic decline, both individuals and corporations often find themselves operating on reduced budgets and cutting costs, often by reducing or eliminating utilization of general aviation aircraft.

Historic data indicate that aviation activity in Texas often fluctuates in corresponding fashion with the general health of the statewide economy. For example, during the oil bust experienced in Texas during the mid 1980's, aviation activity levels in the State were depressed relative to trends experienced at the national level. During the mid- to late-1990s, Texas' economy, along with the national economy, expanded rapidly. Aviation activity statistics for the State during that period tend to reflect strong economic growth in higher levels of air carrier enplanements as well as recovery in some general aviation activity statistics.

Recent economic trends experienced in Texas were summarized in the TASP. TASP analysis indicates that since 1990, the State of Texas has on an annual basis outperformed the United States as whole in the following economic indicators:

- Gross state/national product growth rates
- Personal income growth rates
- Population growth rates
- Employment growth rates

As summary economic data indicate, the State experienced strong economic and demographic growth through the 1990s and one would expect corresponding growth in general aviation activity levels in Texas. Historic general aviation activity in Texas and recent trends will be examined in the following section to determine the impacts that the State's relatively strong economy may have had on the State's general aviation system.

Texas General Aviation Trends

During the 1990s, a period in which the State of Texas experienced rapid economic growth, general aviation activity in the State also experienced a rebound. Like many other states, general aviation activity levels in Texas experienced declining trends through the 1980s, reached relative lows during the early 1990s, and then experienced growth during the mid- to late-1990s. In many cases, however, even though activity indicators in Texas experienced increases during the 1990s, they did not reach the relatively high activity levels seen in the 1980s.

The TASP summarizes general aviation activity trends in Texas through 1999, the base year used in that study. Those general aviation activity indicators examined in the TASP for which the State of Texas was experiencing a generally positive growth trend through the 1990s include the following:

- General aviation active aircraft
- General aviation operations
- General aviation hours flown
- General aviation fuel consumption

The available data indicates that as the Texas economy experienced rapid growth during the 1990s, general aviation activity also increased, but not as dramatically as some statewide economic and demographic measures. The economic downturn experienced since 2001, propagated and perpetuated by the terrorist attacks of September 11, 2001, has undoubtedly had a dampening effect on the general aviation activity rebound experienced in Texas.

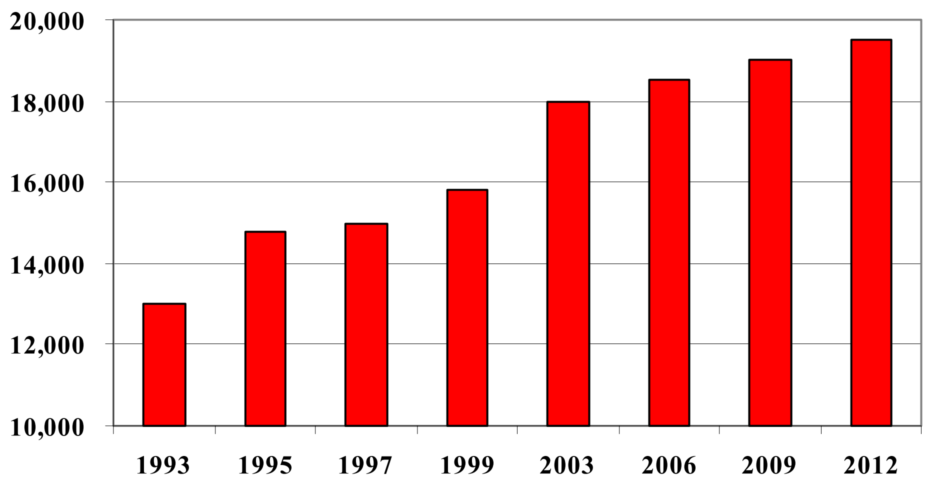
TASP Aviation Activity Forecasts

The recently completed Texas Aviation System Plan Update examined aviation activity at the statewide level and developed aviation activity forecasts through 2012. The TASP forecasts were prepared using a top-down methodology where national activity forecasts were allocated to Texas. The allocation of activity was based on the historical ratios of state-to-national activity and the trends experienced in those relationships in recent years. The TASP developed forecasts of general aviation activity for the following:

- Texas General Aviation Active Aircraft (**Exhibit 4-10**)
- Texas General Aviation Activity (**Exhibit 4-11**)
- Texas Pilots (**Exhibit 4-12**)
- Texas General Aviation Fuel Consumption (**Exhibit 4-13**)

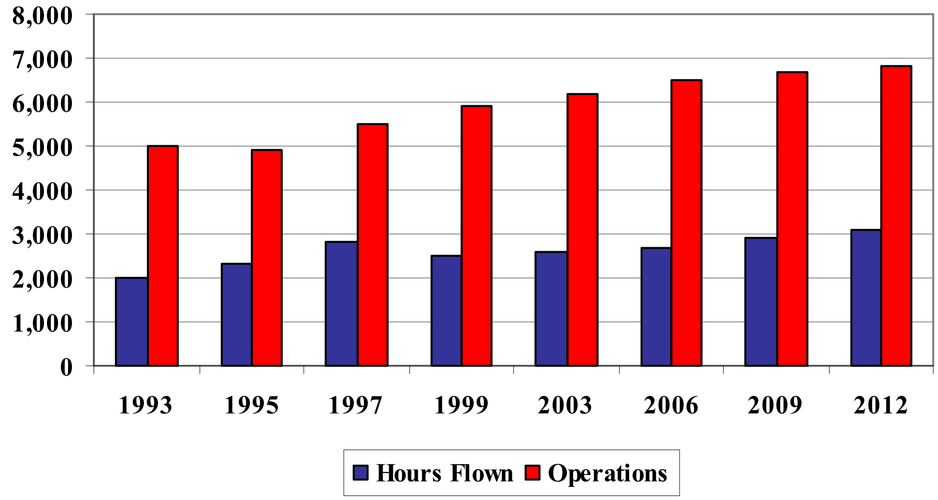
TASP aviation activity forecasts are summarized in the following exhibits.

Exhibit 4-10
Texas General Aviation Active Aircraft



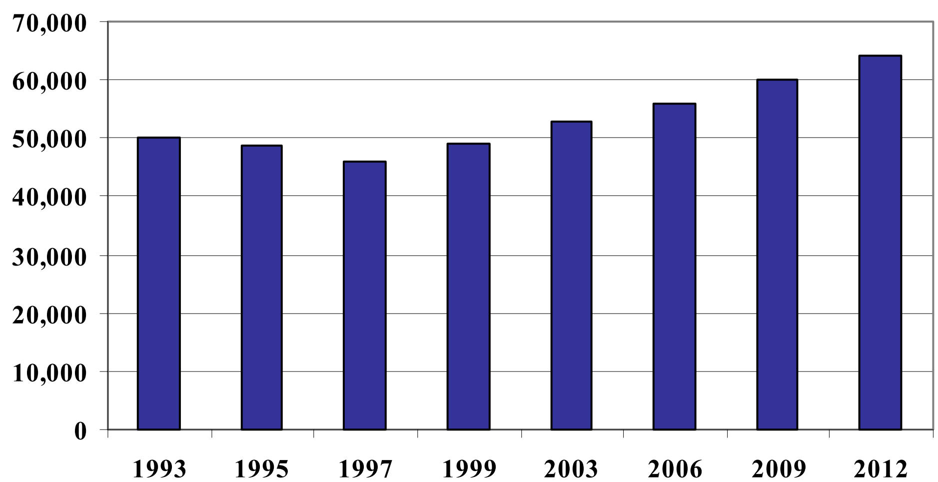
Source: TxDOT, *Texas Airport System Plan Update, 2002*

Exhibit 4-11
Texas General Aviation Activity (Thousands)



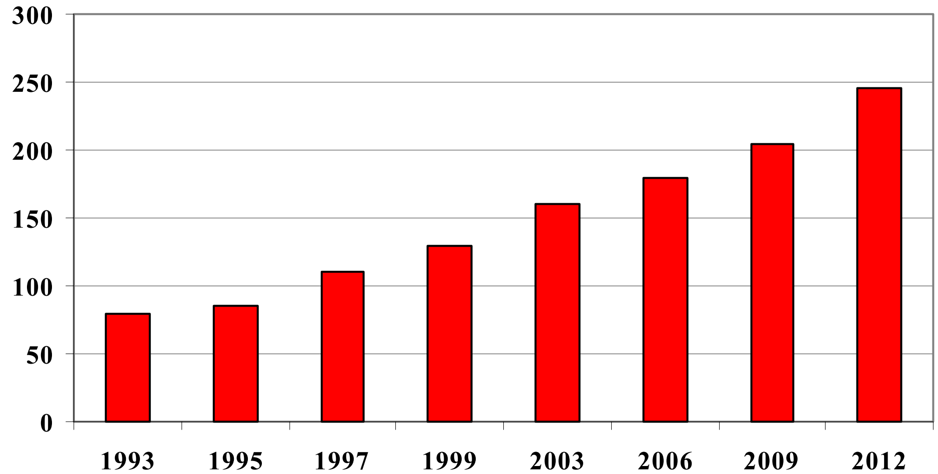
Source: TxDOT, *Texas Airport System Plan Update, 2002*

Exhibit 4-12
Texas Pilots



Source: TxDOT, *Texas Airport System Plan Update, 2002*

Exhibit 4-13
Texas General Aviation Fuel Consumption (Millions of Gallons)



Source: TxDOT, *Texas Airport System Plan Update, 2002*

As the exhibits indicate, the TASP projected growth in each of the general aviation benchmarks examined in its aviation activity forecasts. The major trends identified in the TASP's forecasts were continued strong growth in commercial aviation and renewed but slow growth in general aviation. The TASP activity forecasts were based primarily on the FAA "Aerospace Forecasts, Fiscal Year 2001-2012." The terrorist attacks of September 11, 2001 and the continued economic slow-down experienced at the national level since the development of the forecasts will undoubtedly impact the growth projected in the TASP. However, based on recent economic and demographic trends for the State of Texas and the expectation that the State's economy will grow at a rate above the U.S. growth rate, it is reasonable to assume that Texas aviation activity growth rates will grow relatively higher rates than those national averages over the study period.

Conclusion

Historic and recent trends regarding general aviation activity levels for the U.S. as well as in the State will be important considerations in the development of regional projections of demand for the Central Texas region. In addition, projections of statewide aviation activity developed in the TASP provide indication of anticipated aviation trends in Texas. This data will be used, where applicable, to develop regional projections of aviation demand for the seven county study area.

CHAPTER FIVE
REGIONAL PROJECTIONS OF DEMAND

An important factor to consider when examining the feasibility of a new general aviation airport in the Central Texas area is current and future demand for general aviation facilities. If regional demand for general aviation is shown to significantly increase in the study area, it may be necessary to develop new airport facilities to provide additional landside and/or airside capacity. Furthermore, it is also important to examine future demand to determine if a new facility could potentially accommodate activity levels sufficient to promote its financial viability.

Projections of regional demand in the seven-county study area will be developed for the following:

- Based Aircraft Projections
- General Aviation Operations Projections

Several methodologies will be used to develop projections and from the results of those different methodologies, a preferred projection of based aircraft and general aviation operations for the study area will be selected. A 20-year planning period was selected for these projections. This corresponds to FAA guidelines for airport planning projects.

Based Aircraft Projections

Several different methodologies were used to develop based aircraft projections. This was done, in part, because of significant fluctuations in historic aviation activity that occurred in the study area as a result of the closure of two airports and the subsequent relocation of based aircraft to other facilities. By examining multiple scenarios, the impacts of the one-time events recently experienced in the study area can be examined, and the future growth anticipated in the study area's based aircraft fleet can be quantified based on differing assumptions. The following methodologies were used to develop based aircraft projections for the study period:

- Historic Growth Trends
- Regression Analysis
- Market Share Approach

These different methodologies will be summarized in the following sections and a preferred projection for the study area will be identified.

Historic Growth Trends

Using based aircraft data for the time period 1992 through 2002, two separate time series were analyzed to determine the compound annual growth rate (CAGR) of based aircraft at study area airports. This methodology uses historic growth trends to project growth in the based aircraft fleet in future years, assuming that historic trends will continue into and through this study's project period. Furthermore, by using the CAGR, this methodology minimizes the impacts of volatile swings in activity on the projections by assuming a consistent rate of growth both historically and in the future. This is especially relevant in this analysis as a result of the closures of both Robert Mueller Municipal Airport and Austin Executive Airpark and the subsequent relocation of some study area based aircraft between 1997 and 1999. **Table 5-1** presents summary data regarding historic based aircraft at study area airports.

Table 5-1
Historic Compound Annual Growth Rates

	Single Engine	Multi-engine	Jet	Total
Historic Based Aircraft				
1992	594	143	14	751
1993	599	152	17	768
1994	624	148	22	794
1995	657	141	26	824
1996	769	170	26	965
1997	824	176	27	1,027
1998	810	165	24	999
1999	662	123	20	805
2000	878	141	49	1,068
2001	874	140	37	1,051
2002	890	143	34	1,067
5-Year CAGR (1997-2002)	1.6%	-4.1%	4.7%	0.8%
10-Year CAGR (1992-2002)	4.1%	0.0%	9.3%	3.6%

Source: TxDOT and Wilbur Smith Associates, Inc.

As shown in Table 5-1, the study area experienced a significant fluctuation in based aircraft between 1997 and 2000, the period during which Robert Mueller and Austin Executive closed and Austin-Bergstrom International Airport opened. This fluctuation is most likely the result of aircraft relocating to new facilities within and outside the study area and not being recorded in the based aircraft counts. In addition, a certain number of aircraft owners in the study area sold their aircraft instead of relocating it to a different facility following the airport closures. By 2000, it appears as if based aircraft counts had been updated. Data for 1998 and 1999 should be considered outliers, since during that period it appears that aircraft did not leave the study area, they just were not reported accurately as a result of their movements to different airports. Examining the CAGR for the five-year period (1997-2002) and the ten-year period (1992-2002) avoids the reporting inconsistencies that may have occurred during the transition years (1998 and 1999), and instead, examines the overall trends experienced in each of those periods.

Five-Year CAGR Methodology

Using the 1997 to 2002 based aircraft data for study area airports, CAGR for the three categories of aircraft included in this analysis, as well as the total number of based aircraft, were independently calculated. Historic CAGR experienced for in each aircraft category were the applied to current based aircraft counts, and used to project future based aircraft in the region. The results of this methodology are summarized in **Table 5-2**.

Table 5-2
Projected Based Aircraft - 5-Year CAGR

	Single Engine	Multi-engine	Jet	Total
Historic Based Aircraft				
1997	824	176	27	1,027
2002	890	143	34	1,067
5-Year CAGR (1997-2002)	***1.6%***	***-4.1%***	***4.7%***	
Projected Based Aircraft				
2007	960	146	43	1,149
2012	1,040	150	54	1,244
2017	1,130	153	68	1,351
2022	1,220	157	85	1,462

Source: TxDOT and Wilbur Smith Associates, Inc.
Note: Single engine figures rounded to the nearest 10s.

As shown in Table 5-2, single engine aircraft experienced a CAGR of approximately 1.6 percent in the study area for the period 1997 through 2002. The number of multi-engine aircraft based in the study area decreased during the same period and jet aircraft experienced a CAGR of approximately 4.7 percent. For each category of aircraft, the 5-year CAGR experienced between 1997 and 2002 (1995-2002 CAGR for multi-engine) was held constant through the projection period to develop future activity forecasts. Multi-engine aircraft were estimated to increase slightly, from 143 to 157, during the projection period. Based on this approach, total based aircraft in the study area are projected to increase from 1,067 in 2002 to 1,462 by 2022. It is anticipated that based jet aircraft will experience the fastest growth rates (CAGR of 4.7 percent), while single engine aircraft will experience the greatest nominal increase (330 aircraft).

Ten-Year CAGR Methodology

Using a similar methodology, the 10-year CAGR identified for study area single engine, multiengine, and jet aircraft for the period 1992 through 2002 were applied to 2002 based aircraft data and used to develop projections of based aircraft through 2022. The results of this approach are summarized in **Table 5-3**.

Table 5-3
Projected Based Aircraft – 10-Year CAGR

	Single Engine	Multi-engine	Jet	Total
Historic Based Aircraft				
1992	597	143	14	751
2002	890	143	34	1,067
10-Year CAGR (1992-2002)	***4.1%***		***9.3%***	
10-Year AAGR (1992-2002)		***0.7%***		
Projected Based Aircraft				
2007	1,090	148	53	1,291
2012	1,330	154	83	1,567
2017	1,630	160	129	1,919
2022	1,990	166	201	2,357

Source: TxDOT and Wilbur Smith Associates, Inc.
Note: Single engine figures rounded to the nearest 10s.

Over the 10-year period 1992 to 2002, single engine aircraft grew at a CAGR of approximately 4.1 percent and jets grew at a CAGR of approximately 9.3 percent. Multi-engine aircraft fluctuated during the period, and experienced and average annual growth rate of approximately 0.7 percent between 1992 and 2002. The historic 10-year average growth rate of each aircraft type was held constant and applied to current study area based aircraft data for each aircraft type and used to project study area based aircraft through the projection period. Using this methodology, total based aircraft in the study area are projected to increase from 1,067 in 2002 to over 2,357 in 2022. During this period, approximately 900 additional single engine aircraft and almost 150 jet aircraft are anticipated to be added to the study area's aircraft fleet.

Regression Analysis

The regression analysis methodology uses statistical techniques to find relationships between variables for the purpose of estimating future values, in this case based aircraft. Using a regression analysis, the dependent variables examined in this analysis – based single engine, multi-engine, and jet aircraft – were compared to the six independent variables of population, employment, earnings, personal income, number of households, and retail sales for the seven-county study area. The data for these independent variables (both historic and projected) came from Woods & Poole Economics, Inc. A correlation coefficient was calculated for each pairing of dependent to independent variable. This coefficient indicates how much of the change in the dependent variable is explained by the change in the independent variable. **Table 5-4** identifies the correlation coefficient for each pair of variables examined in this analysis.

Table 5-4
Comparison of Correlation Coefficients

Independent Variable	Dependent Variable	Correlation Coefficient
Population vs.	Single Engine	0.68
	Multi-engine	(0.47)
	Jet	0.56
Employment vs.	Single Engine	0.65
	Multi-engine	(0.48)
	Jet	0.54
Earnings vs.	Single Engine	0.59
	Multi-engine	(0.55)
	Jet	0.52
Personal Income vs.	Single Engine	0.61
	Multi-engine	(0.53)
	Jet	0.52
Number of Households vs.	Single Engine	0.67
	Multi-engine	(0.46)
	Jet	0.54
Retail Sales vs.	Single Engine	0.67
	Multi-engine	(0.44)
	Jet	0.55

Source: TxDOT, Woods & Poole Economics, Inc., and Wilbur Smith Associates, Inc.

The correlation between independent variables and the dependent variables in this analysis was negatively impacted by the closures of Robert Mueller Municipal Airport and Austin Executive and the opening of Austin-Bergstrom International Airport. These events resulted in fluctuations in the dependent variable base-data (based aircraft) that would not have been expected otherwise, and therefore, made the correlation coefficients less than what would normally be expected. However, despite this data discontinuity, some of the correlation coefficients were determined to be viable for use in this analysis.

As illustrated in Table 5-4, the correlation between population and historic based aircraft data in the study area tends to be higher than the other independent variables used in this analysis. Because of its relatively higher correlation to based aircraft data, population was selected as the independent variable for the development of based aircraft forecasts through the projection period. Projections of based aircraft in the study area were developed by using a regression analysis that correlated based aircraft to population projections developed by Woods & Poole.

Woods & Poole data was used for this analysis because the firm had developed population projections for each year through 2010, and in five-year increments for the period 2015 to 2025, which provided more data points for the regression analysis than population projections from other sources. Woods & Poole projections were compared to population projections developed by the Texas State Data Center and the projected population growth rates identified in each were almost identical. Data for interim years in the Woods & Poole population projections were interpolated. **Table 5-5** summarizes the results of the regression analysis.

Table 5-5
Based Aircraft Projection - Regression Analysis

	Population	Single Engine	Multi-engine	Jet	Total
Historic					
1995	1,073,139	657	141	26	824
1996	1,116,730	769	170	26	965
1997	1,156,891	824	176	27	1,027
1998	1,201,511	810	165	24	999
1999	1,251,254	662	123	20	805
2000	1,302,760	878	141	49	1,068
2001	1,342,140	874	140	37	1,051
2002	1,381,812	890	143	34	1,067
Projected					
2007	1,580,512	1,020	148	37	1,205
2012	1,781,661	1,150	152	41	1,343
2017	1,986,803	1,280	157	45	1,482
2022	2,196,428	1,410	161	50	1,621

Note: Population figures interpolated for 2012, 2017, and 2022.
Source: TxDOT, Woods & Poole Economics, Inc., and Wilbur Smith Associates, Inc.

As shown in Table 5-4, there was a negative correlation between multi-engine aircraft and all of the independent variables, indicating that as population increased, for example, multi-engine aircraft in the study area decreased. In this analysis, because no significant correlation existed between multi-engine aircraft and the independent variables, the projection of based multi-engine aircraft was held constant at its 2002 level. Using this methodology, total based aircraft in the study area are projected to increase from 1,067 in 2002 to 1,621 in 2022. Of the 554 aircraft anticipated to be added the regional fleet mix based on the regression analysis, approximately 520 are anticipated to be single engine aircraft, 18 multi-engine, and the remaining 16 are anticipated to be jet aircraft

Market Share Approach

The market share approach examined the FAA data regarding historic and projected general aviation aircraft fleet mix for the nation and determined the study area's share of each component of the national fleet. The study area's current market share of the national fleet for single engine, multi-engine, and jet aircraft was held constant through the projection period and applied to the FAA's projection of active general aviation aircraft for the period 2002 through 2014. The CAGR during the final three years of the FAA projection period (2011 through 2014) was held constant and used to extrapolate the nation's active general aviation fleet mix through 2022, the planning horizon of the this study. The results of this projection methodology are summarized in **Table 5-6**.

Table 5-6
Based Aircraft Projection - Market Share Analysis of FAA Active Aircraft

	Single Engine			Multi-engine			Jet			Study Area Total
	FAA	Study Area	Market Share	FAA	Study Area	Market Share	FAA	Study Area	Market Share	
Historic										
2002	164,900	890	0.540%	24,840	143	0.576%	8,000	34	0.425%	1,067
Projected										
2007	170,450	920	0.540%	25,260	145	0.576%	9,500	40	0.425%	1,106
2012	175,450	950	0.540%	25,690	148	0.576%	11,500	49	0.425%	1,147
2017	179,950	970	0.540%	26,010	150	0.576%	13,500	57	0.425%	1,177
2022	184,450	1,000	0.540%	26,310	151	0.576%	15,500	66	0.425%	1,217

Source: FAA Aerospace Forecasts, March 2003, TxDOT, and Wilbur Smith Associates, Inc.

As shown in Table 5-6, this methodology assumes that the study area's current share of each component of the national active aircraft fleet will remain constant through the projection period. For example, this analysis indicates that approximately 0.540 percent of the nation's active single engine aircraft are located in the study area. Holding this percentage constant through the projection period, and applying it to the FAA's projection of active single engine aircraft for the nation, develops an estimate of the study area's single engine aircraft through 2022. Based on a constant market share and FAA active aircraft projections, single engine aircraft in the study area are projected to increase from 890 in 2002 to approximately 1,000 by 2022. The same methodology was used to project multi-engine aircraft and jet aircraft for the study area. Multi-engine aircraft in the study area are projected to grow slightly over the projection period, increasing from 143 in 2002 to 151 in 2022. Jet aircraft in the study area are projected to increase from 34 in 2002 to approximately 66 in 2022. This methodology results in a total based aircraft projection for the study area that increases from 1,067 total based aircraft in 2002 to 1,217 aircraft in 2022.

Preferred Based Aircraft Projection Scenario

The various methods of estimating future based aircraft in the study area produced a range of outcomes. The results of each projection methodology for the final year of the projection period, 2022, are summarized in **Table 5-7**.

Table 5-7
Comparison of 2022 Projection Results

	Single Engine	Multi-engine	Jet	Total
5-year CAGR	1,220	157	85	1,462
10-Year CAGR	1,990	166	201	2,357
Regression Analysis	1,410	161	50	1,621
FAA Market Share	1,000	151	66	1,217

Source: Wilbur Smith Associates, Inc.

The preferred based aircraft projection selected for this analysis is a composite of the various projection scenarios examined. A preferred projection of each component of the based aircraft fleet, including single engine, multi-engine, and jet aircraft, was selected individually. The preferred projections of each component of the fleet mix were then summed to identify the preferred total based aircraft projection for the study area. **Table 5-8** presents the preferred projection of based aircraft for the study area through 2022.

Table 5-8
Summary of Preferred Projection

	Single Engine	Multi-engine	Jet	Total
Historic Based Aircraft				
2002	890	143	34	1,067
Projected Based Aircraft				
2007	1,020	145	43	1,208
2012	1,150	148	54	1,352
2017	1,280	150	68	1,498
2022	1,410	151	85	1,646
Projected CAGR (2002-2022)	**2.3%**	**0.3%**	**4.7%**	**2.2%**

Source: TxDOT and Wilbur Smith Associates, Inc.
Note: Single engine figures rounded to the nearest 10s.

The preferred projection of based single engine aircraft was developed using the regression analysis. The regression analysis resulted in a relatively conservative growth rate compared to the results of other methodologies. The regression analysis was selected as the preferred projection for single engine aircraft because it tied future growth to anticipated demographic trends in the study area and resulted in a reasonable outcome.

The FAA market share approach results were selected as the preferred projection of multi-engine in the study area. The market share approach was selected for multi-engine aircraft because it showed a modest amount of growth, consistent with FAA projections regarding trends in the national general aviation aircraft fleet. The five-year CAGR approach was selected for jet aircraft projections for similar reasons, it was developed based on historic based aircraft trends in the study area and it is consistent with FAA projections regarding the future national general aviation aircraft fleet mix. Even through the recent periods of recessionary economic conditions, jet aircraft were the fastest growing component of the national general aviation fleet. The FAA anticipates that this trend will continue on the national level, and the preferred projection scenario assumes similar trends in the Central Texas study area.

Table 5-9 provides a summary comparison of the preferred based aircraft projection (a composite of several methodologies) for the study to low- and high-growth scenarios that resulted from other methodologies.

Table 5-9
Based Aircraft Projection for Study Area

	Low				Preferred				High			
	5-year CAGR (1997-2002)				Regression Analysis, FAA Market Share Analysis, and 5-year CAGR (1997-2002)				10-year CAGR (1992-2002)			
	Single Engine	Multi-engine	Jet	Total	Single Engine	Multi-engine	Jet	Total	Single Engine	Multi-engine	Jet	Total
Historic												
1995	657	141	26	824	657	141	26	824	657	141	26	824
1996	769	170	26	965	769	170	26	965	769	170	26	965
1997	824	176	27	1,027	824	176	27	1,027	824	176	27	1,027
1998	810	165	24	999	810	165	24	999	810	165	24	999
1999	662	123	20	805	662	123	20	805	662	123	20	805
2000	878	141	49	1,068	878	141	49	1,068	878	141	49	1,068
2001	874	140	37	1,051	874	140	37	1,051	874	140	37	1,051
2002	890	143	34	1,067	890	143	34	1,067	890	143	34	1,067
Projected												
2007	960	146	43	1,149	1,020	145	43	1,208	1,090	148	53	1,291
2012	1,040	150	54	1,244	1,150	148	54	1,352	1,330	154	83	1,567
2017	1,130	153	68	1,351	1,280	150	68	1,498	1,630	160	129	1,919
2022	1,220	157	85	1,462	1,410	151	85	1,646	1,990	166	201	2,357

Sources: TxDOT, Woods & Poole Economics, Inc., and Wilbur Smith Associates, Inc.
Preferred Projection notes:
1. Single engine projection based on regressions analysis.
2. Regression analysis correlated single engine based aircraft to population with a 0.68 correlation coefficient.
3. Multi-engine projection based on FAA market share analysis.
4. Jet projection based on 5-year CAGR analysis.
5. Single Engine projection rounded to nearest 10s.

The preferred projections of based aircraft presented in Table 5-9 will be carried forth in this analysis and used to determine the feasibility of a new general aviation airport in the study area as well as its potential facility needs. These projections will also serve as the basis for developing master plan projections, in Phase III of this study, if required.

General Aviation Operations Projections

Similar to based aircraft, several methodologies were used to develop projections of general aviation operations in the study area. These methodologies produced a range of general aviation operations projections from which a preferred scenario was selected. The methodologies used to project general aviation operations in the study area for the period 2002 through 2022 include the following:

- Operations Per Based Aircraft
- Regression Analysis
- FAA Forecast of Hours Flown

Each of these methodologies and their results will be examined in the following sections and a preferred scenario will be selected.

Operations Per Based Aircraft

One common method of estimating future general aviation operations at airports is to determine the historic ratio of operations per based aircraft (OPBA) and apply that number to projections of based aircraft. By examining total based aircraft in the study area and total general aviation operations, the study area's 2002 OPBA was calculated. The study area's 2002 OPBA was held constant through the projection period and used to project future general aviation operations in the region based using the preferred based aircraft projection. **Table 5-10** summarizes the projections of study area total general aviation operations that resulted from the OPBA methodology.

Table 5-10
OPBA
Projection of General Aviation Operations

	Study Area Based Aircraft	OPBA	Total General Aviation Operations
Historic			
2002	1,067	472	504,139
Projected			
2007	1,208	472	570,200
2012	1,352	472	638,100
2017	1,498	472	707,100
2022	1,646	472	776,900

Source: TxDOT, and Wilbur Smith Associates, Inc.
Note: 1. Projected General Aviation Operations rounded to nearest 100s.

As shown in Table 5-10, the study area's OPBA ratio for 2002 was calculated at 472. It is important to note that the OPBA ratio is comprised of both local and transient aircraft operations occurring at study area airports, by both locally-based and transient general aviation aircraft. This study OPBA ratio was applied to the preferred projection of based aircraft to develop projections of total general aviation operations in the study area. As shown in Table 5-10, the OPBA methodology estimates total study area general aviation operations to increase from approximately 504,100 in 2002 to approximately 776,900 in 2022.

Regression Analysis

A regression analysis was performed on historic general aviation operations using the same independent variables that were used in the based aircraft regression analysis. As in the previous analysis, the highest correlation identified in the general aviation operations regression was with the population independent variable. A regression analysis utilizing population projections for the study area was used to develop projections of total general aviation operations in the study area for the years 2002 through 2022. The results of this regression analysis are summarized in **Table 5-11**.

Table 5-11
Regression Analysis
Projection of General Aviation Operations

	Population	Total General Aviation Operations
Historic		
1995	1,073,139	331,494
1996	1,116,730	424,398
1997	1,156,891	433,132
1998	1,201,511	436,007
1999	1,251,254	323,805
2000	1,302,760	490,560
2001	1,342,140	497,783
2002	1,381,812	504,139
Projected		
2007	1,580,512	576,600
2012	1,781,661	650,000
2017	1,986,803	724,900
2022	2,196,428	801,300

Note: Population figures interpolated for 2012, 2017, and 2022.
Source: TxDOT, Woods & Poole, Inc., and Wilbur Smith Associates, Inc.

Using a regression analysis based on projected population growth in the study area, total general aviation operations in the study area are projected to increase from approximately 504,140 in 2002 to approximately 801,300 in 2022.

FAA Forecast of Hours Flown

Another methodology used to develop projections of general aviation operations in the study area was based on FAA projections of national general aviation activity, in this case represented by general aviation hours flown, developed and presented in FAA's *Aerospace Forecasts Fiscal Years 2003-2014*. The FAA tracks total hours flown by aircraft in the nation's general aviation fleet. Although they are two separate measures of aviation activity, hours flown and total general aviation operations are directly related to one-another. At both the national and local levels, increases in general aviation hours flown can reasonably be assumed to lead to proportionate increases in total general aviation operations.

The relationship between total hours flown and total general aviation operations was used to develop projections of total general aviation operations in the study area. The results of this projection methodology are summarized in **Table 5-12**.

Table 5-12
FAA Forecast of Hours Flown
Projection of Total General Aviation Operations Projection

	Total Hours Flown (in thousands)	Percent Change From Previous Year	Total General Aviation Operations
Historic			
2002	29,455	NA	504,139
Projected			
2007	31,695	1.6%	542,500
2012	34,215	1.5%	585,600
2017	36,971	1.6%	632,800
2022	39,954	1.6%	683,900

Source: FAA Aerospace Forecasts, March 2003, TxDOT, and Wilbur Smith Associates, Inc.
Note: General aviation operations rounded to nearest 100s.

As shown in Table 5-12, total general aviation operations in the study area are projected to increase from approximately 504,100 in 2002 to approximately 683,900 in 2022. This forecast of future activity levels is driven by the FAA forecast of general aviation hours flown. During 2003, the FAA projects that general aviation hours flown will increase by 1.2 percent. In ensuing years of the forecast period FAA projections estimate that general aviation hours flown will increase annually with single year increases ranging from 1.4 percent to 1.7 percent.

Preferred Total General Aviation Operations Projection Scenario

Three different methodologies were used to develop projections of total general aviation operations in the study area. These different methodologies each estimated future activity levels by tying total general aviation operations in the study area to national and local activity indicators including national general aviation hours flown, local ratios of operations per based aircraft, and local population projections. The results of these projection scenarios are compared in **Table 5-13** and the preferred methodology is identified.

Table 5-13
Comparison of General Aviation Operations Projections

	Low	Preferred	High
	FAA Hours Flown Growth Projection	OPBA	Regression Analysis
Historical			
2002	504,139	504,139	504,139
Projected			
2007	542,500	570,200	576,600
2012	585,600	638,100	650,000
2017	632,800	707,100	724,900
2022	683,900	776,900	801,300

Source: FAA Aerospace Forecasts, March 2003, TxDOT, Wilbur Smith Associates, Inc.
Note: Projected operations rounded to nearest 100s.

As shown in Table 5-13, the OPBA methodology was selected as the preferred methodology for projecting total general aviation operations in the Central Texas study area. The OPBA methodology was selected because it related future activity levels to a local activity indicator (study area OPBA for 2002). By applying the study area's OPBA to the preferred projection of based aircraft, which takes into account future population growth in the area and anticipated national general aviation fleet mix changes, a conservative estimate of future general aviation operations is developed. The hours flown methodology and the regression analysis, resulted in low-growth and high growth projection scenarios, respectively. The low growth scenario is not considered reflective of the strong state and regional demand that currently exists. The regression analysis sets the upper boundaries of potential demand. In the preferred projection scenario, total general aviation operations in the study are projected to experience a CAGR of approximately 2.2 percent through the projection period.

Regional Demand Summary

Several different methodologies were used to develop projections of regional aviation activity, including based general aviation aircraft and total general aviation operations, for a 20-year projection period. These different methodologies examined national and local trends including population growth in study area counties as well as growth, fleet mix, and usage trends for general aviation aircraft. Preferred projection scenarios were selected from the outcomes of the various projection methodologies. **Table 5-14** summarizes the preferred projections of regional demand for the Central Texas study area.

Table 5-14
Preferred Projections of Regional Demand

	Preferred Projection of Based Aircraft				Preferred Projection of Total General Aviation Operations
	Single Engine	Multi-engine	Jet	Total Based Aircraft	Total General Aviation Operations
Historical					
2002	890	143	34	1,067	504,139
Projected					
2007	1,020	145	43	1,208	570,200
2012	1,150	148	54	1,352	638,100
2017	1,280	150	68	1,498	707,100
2022	1,410	151	85	1,646	776,900
Projected CAGR (2002-2022)	**2.3%**	**0.3%**	**4.7%**	**2.2%**	**2.2%**

Source: Wilbur Smith Associates, Inc.

As shown in Table 5-14, total based aircraft in the study area are projected to grow at a CAGR of approximately 2.2 percent through the projection period. Growth experienced by single engine and jet aircraft is expected to be significantly greater than the multi-engine component of the local general aviation aircraft fleet, consistent with projections of the national general aviation fleet. The projections indicate that of the approximately 580 additional general aviation aircraft anticipated for the study area, 95 percent are anticipated to be single engine aircraft, four percent are anticipated to be jet aircraft, and the remaining one percent is comprised of new multi-engine aircraft. It is important to reiterate that although most new aircraft are anticipated to be single engine aircraft, jet aircraft are projected to be the fastest growing component of the fleet.

Total general aviation operations in the study area are projected to increase from approximately 504,100 in 2002 to approximately 776,900 in 2022. This represents a CAGR of approximately 2.2 percent through the projection period. The preferred projection of total general aviation operations was developed by using an OPBA methodology. The OPBA methodology assumed that approximately 472 total general aviation operations would occur in the study area for each general aviation aircraft based at a system airport. This is a common methodology used to develop operations projections and the OPBA ratio identified for the study area is well-within acceptable planning ranges.

The demonstrated increase in demand for aviation services, more than 270,000 additional general aviation operations and 580 based general aviation aircraft, assumes a relatively unconstrained scenario. In other words, for this regional demand to be accommodated, airport facilities must be in place to serve projected aircraft activity levels. The following chapter will provide an overview of the Study Area's ability to accommodate the projected increase in aircraft activity.

CHAPTER SIX
IMPLICATIONS OF REGIONAL DEMAND PROJECTIONS

As was discussed in the previous chapter, the unconstrained demand projected through 2022 for the study area includes approximately 580 additional based aircraft and more than 270,000 additional general aviation operations. It is important to examine these projections of regional demand in the context of existing airport facilities as well as existing and anticipated demographic conditions in the seven-county area. In order to understand the ability of existing aviation facilities in the study area to accommodate this projected regional demand it is necessary to examine existing airport facilities, current and anticipated demographic trends in the study area, as well as other factors that may impact Central Texas' aviation system over the projection period.

Generation of Regional Demand

The projection of regional demand developed in this study estimated that total based aircraft in the study area will increase from approximately 1,070 in 2002 to approximately 1,646 in 2022. General aviation aircraft operations are projected to increase from approximately 504,100 in 2002 to approximately 776,900 in 2022. While these projections were developed for the Central Texas region, an area including Travis and its six contiguous counties, an important consideration is the location within the region where the increased demand is anticipated to be generated, typically referred to as "demand nodes". These demand nodes are reflective of current densities of population and businesses. In general, as the population and number of business within a given area increase, the general aviation activity associated with the area should increase. Conversely, in areas of lower population or business density and growth, the overall levels of demand are anticipated to be relatively lower.

A GIS analysis was used in this study to examine current population levels, business locations, and owners of registered aircraft locations in the study area. As discussed in the market area overview, Travis and Williamson counties contain more than 82 percent of the area's population. This is followed by Hays County with just under 10 percent of the study area's population. These three counties comprise approximately 90 percent of the study area's total current population, a trend that is projected to continue throughout the study period. Over the next twenty years, the study area's total population is projected to increase by approximately 651,500 persons. Again, 90 percent of this population growth is projected to occur in Travis, Williamson, and Hays counties. Population growth in these counties could be further propagated by planned roadway improvements in the study area. A number of roadway improvements are planned over the 20 years in the study area, however, the majority of these projects are planned to occur in Travis County, and the southern portion of Williamson County. One of the most important roadway improvement projects planned in the study area is the continued development of Route 130 in order to provide additional capacity for north-south vehicular traffic in the study area. Other planned roadway improvements are related to improving east-west arterial roads that bring traffic to the major north-south roadway corridors.

Exhibit 6-1 depict major area employers by industry classification that have been determined by previous studies to have a high propensity to use aviation services.[1] **Exhibit 6-2** depicts the location of registered aircraft owners. As anticipated, the majority of these aviation demand indicators are clustered along I-35 in proximity to Austin. The greatest density of these demand nodes begins in the City of San Marcos and extends to Georgetown.

In general, the analysis indicates that the study area's primary demand nodes are located in Travis, Williamson, and to a lesser extent Hays, counties along the north-south I-35 corridor. While other sections in the Study Area will undoubtedly experience increased aviation demand as their communities grow, for an airport to serve the greatest demand density it must be proximate to this corridor. This interstate corridor should be considered the study area's primary demand center, both currently and in the future, and the ability of airports located along or proximate to this corridor should be examined to determine their ability to accommodate current and anticipated general aviation demand. While the regional projections of demand developed in a previous chapter relate to general aviation activity in the study area, it is reasonable to assume that most of the increased demand should be expected in these three counties, generated by the identified nodes of demand.

[1] Economic Impact of General Aviation Airports in Texas, Wilbur Smith Associates, 2003

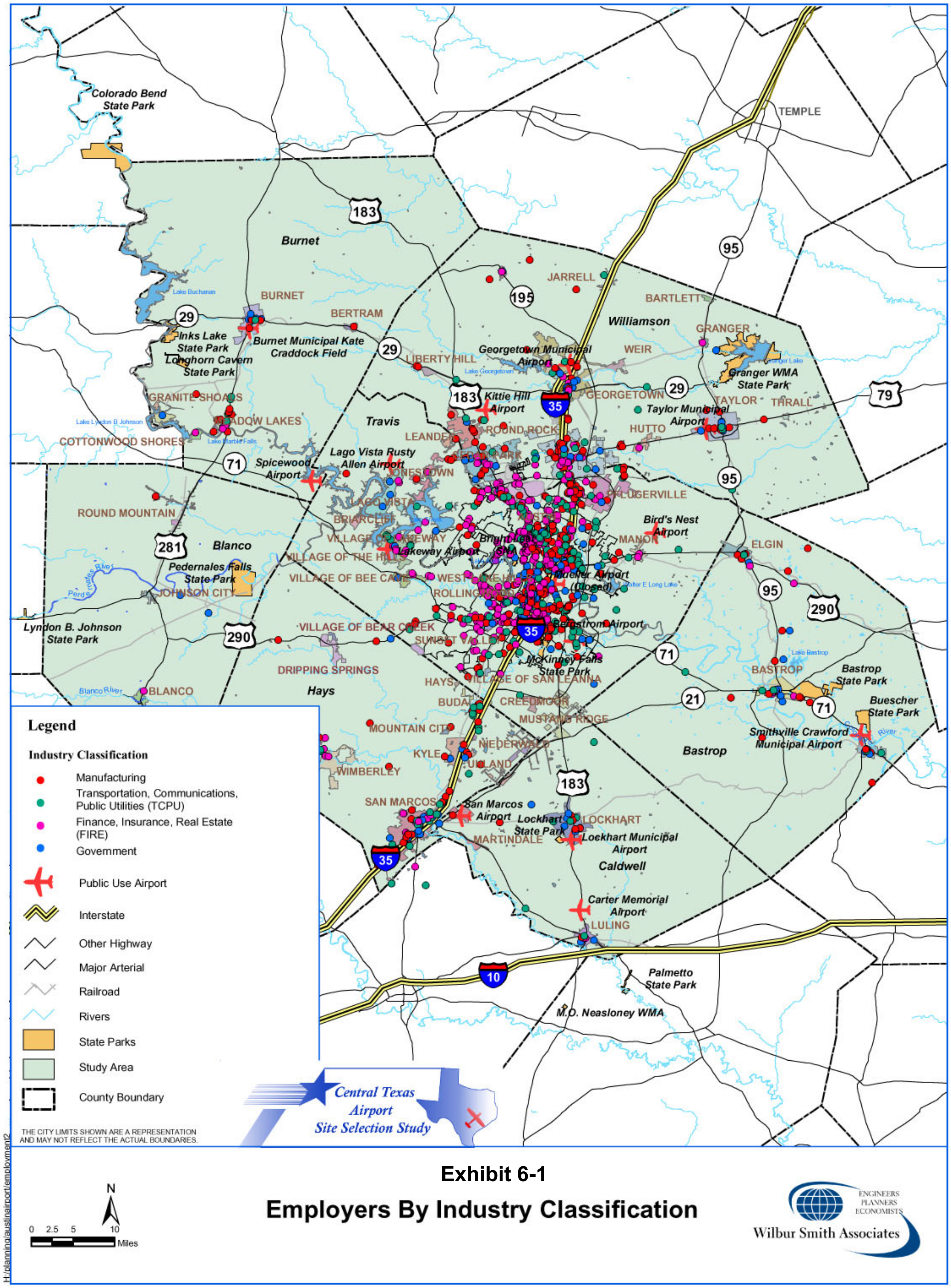


Exhibit 6-1

Employers By Industry Classification

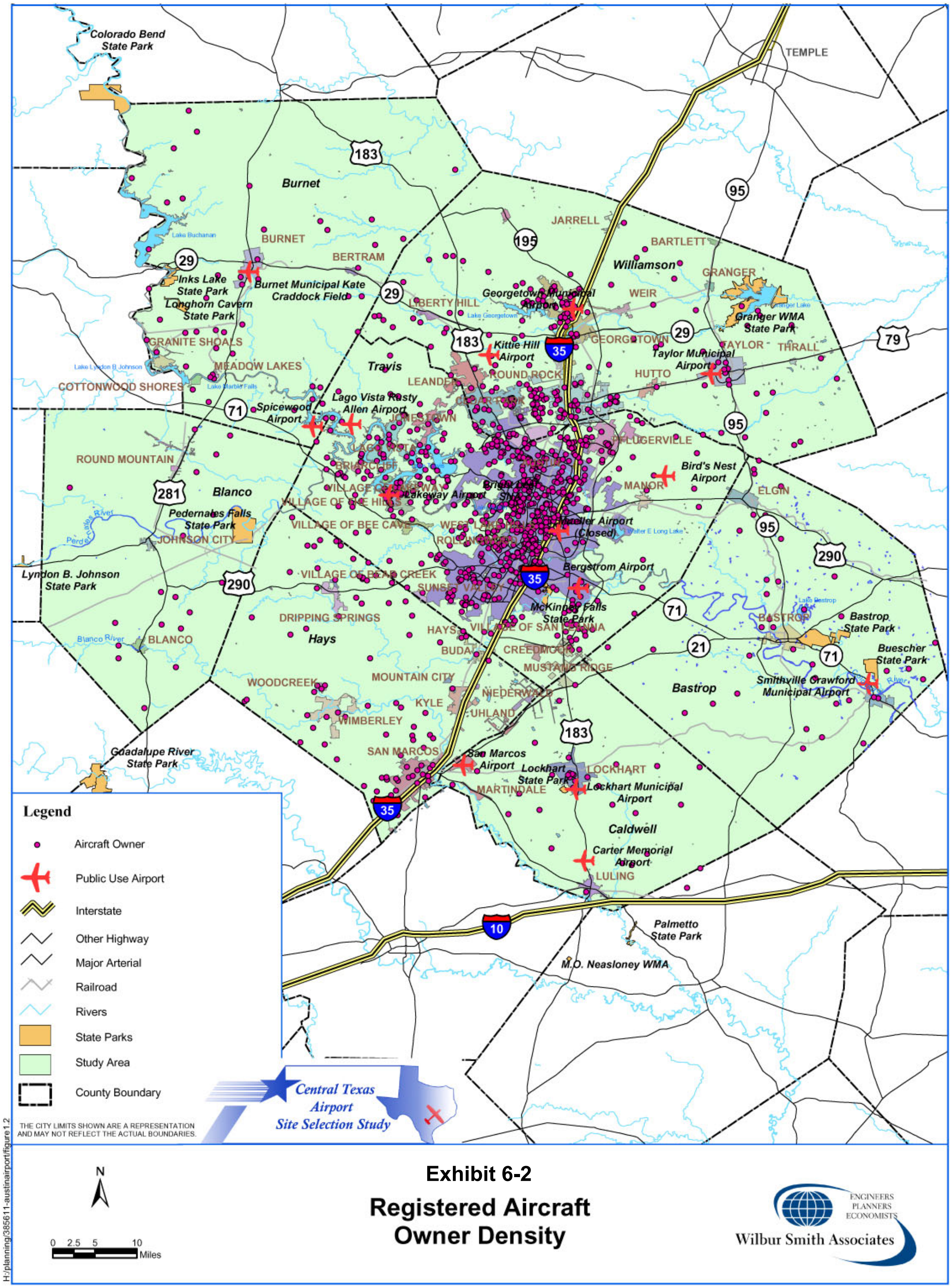


Exhibit 6-2

Registered Aircraft Owner Density

Comparison of Airport Facilities

The ability of existing airport facilities in Travis, Williamson, and Hays counties to accommodate existing and anticipated levels and types of general aviation demand generated in the primary demand nodes will be examined in the following sections. In addition, existing airport facilities in the study that are located outside the primary demand nodes will also be examined. Current and projected trends in general aviation, both locally and at the national level, reflect the growing importance of business jet aircraft in the active fleet. Business jet aircraft of all sizes typically require more advanced facilities to accommodate their operations. Runway length requirements and approach minimums and capabilities are vital concerns of jet aircraft operators since they more frequently operate in all-weather conditions and carry more passengers relative to smaller, single engine piston aircraft. While business and recreational activities by smaller general aviation aircraft will continue to be an important concern in the study area, the ability of study area airports to accommodate growing general aviation jet aircraft operations is vital to the needs of corporate and executive aviation users in the region as well as the region's continued economic development.

There are currently three airport facilities located in Travis, Williamson, and Hays counties that offer a full complement of aviation facilities and services that are capable of accommodating most components of the general aviation fleet, including business jet aircraft. Georgetown Municipal Airport, San Marcos Municipal Airport, and Austin-Bergstrom International Airport each have runways of at least 5,000 feet and varying degrees of navigational aid instrumentation that are capable of accommodating operations by business aircraft. These airports also support significant amounts of business and recreational operations conducted by smaller general aviation aircraft.

These three airports currently house approximately 61 percent of the study area's total based aircraft fleet and accommodate approximately 74 percent of all aircraft operations in the study area. Without the construction of a new general aviation facility in the study area, it is likely that these three airports would need to accommodate a similar percentage of the projected demand.

Existing facilities at these airports, their capacity to accommodate aircraft operations, and their expansion potential are summarized in **Table 6-1**.

Table 6-1
Key Airport Comparisons

	Airport		
	Austin-Bergstrom International	Georgetown Municipal	San Marcos Municipal
Length of Primary Runway	12,248	5,000	5,603
Available Approach Type	Precision	Non-precision	Precision
Demand/Capacity			
- Annual Service Volume (est.)	370,000	200,000	210,000
- Total Aircraft Operations	219,186	171,873	103,476
- Demand/Capacity Ratio	59%	86%	49%
Landside Expansion Potential	Good	Limited/None	Good

It is important to note that although the other airports in the study area are not located proximate to the major demand nodes identified, they will continue to be important components of Central Texas' regional aviation system in the future. Existing facilities and expansion potential at the other study area airports are summarized in **Table 6-2**.

Table 6-2
Other Study Area Airport Comparisons

	Airport		
	Bird's Nest	Lakeway	Lago Vista Tx – Rusty Allen
Length of Primary Runway	2,722	3,865	3,808
Available Approach Type	Visual	Non-precision	Non-precision
Demand/Capacity			
- Annual Service Volume (est.)	200,000	200,000	200,000
- Total Aircraft Operations	5,700	13,500	25,450
- Demand/Capacity Ratio	3%	7%	13%
Expansion Potential	Good	Good	Good

Table 6-2 (cont.)
Other Study Area Airport Comparisons

	Airport		
	Kittie Hill	Spicewood	Taylor Municipal
Length of Primary Runway	3,450	3,900	3,498
Available Approach Type	Visual	Visual	Non-precision
Demand/Capacity			
- Annual Service Volume (est.)	200,000	200,000	200,000
- Total Aircraft Operations	22,800	4,500	15,300
- Demand/Capacity Ratio	11%	2%	8%
Expansion Potential	Good	Good	Good

	Airport			
	Lockhart	The Carter Memorial	Smithville Crawford Municipal	Burnet Municipal – Kate Craddock Field
Length of Primary Runway	4,001	2,790	4,000	5,000
Available Approach Type	Non-precision	Visual	Non-precision	Non-precision
Demand/Capacity				
- Annual Service Volume (est.)	200,000	200,000	200,000	200,000
- Total Aircraft Operations	17,412	900	6,050	24,180
- Demand/Capacity Ratio	9%	1%	3%	12%
Expansion Potential	Good	Good	Good	Good

As indicated in Table 6-2, the other airports located in the study have sufficient facilities and capacity to accommodate general aviation demand generated in their respective market areas. Their current demand/capacity ratios indicate that operational constraints are not anticipated to impact their current and/or future operations. As general aviation activity and demand for general aviation facilities may grow at these study area airports, TxDOT should work with airport sponsors to pursue airport development projects that will better serve the needs of airport users as specific infrastructure needs are identified and proper justification is compiled.

The following sections will examine existing airports located proximate to the primary demand nodes and discuss their ability to meet general aviation demand generated in those nodes.

Runway Length/Available Approach

As shown in Table 6-1, each of the three airports have runways with lengths equal to or exceeding 5,000 feet, a common minimum recommendation for regularly accommodating jet aircraft operations. While Austin-Bergstrom International and San Marcos Municipal have precision approach capabilities, Georgetown Municipal is limited to non-precision capabilities. Lacking a precision approach, Georgetown Municipal Airport cannot accommodate appropriately equipped aircraft in the poorest weather/visibility conditions. When atmospheric conditions limit visibility below the operating requirements at Georgetown Municipal, aircraft attempting to operate at the facility would be forced to divert to another area airport where visibility minimums are met, or where precision approach capabilities are available. This is an important consideration because many jet aircraft operators require or strongly prefer precision approach capabilities at the facilities where they regularly operate to minimize the costs and delays associated with diverting to other airports when weather conditions require.

Demand/Capacity

The Demand/Capacity of an airport is one determination of the airport's facilities to adequately accommodate existing and projected demand levels related to aircraft operations. As airports reach key benchmarks in terms of demand/capacity ratios, delay and congestion increase exponentially. New aviation facilities and/or facility and capacity enhancement projects at existing facilities are typically recommended to address safety, delay, and congestion issues at capacity constrained airports. Understanding airport-specific capacity issues in the study area was an important consideration in determining the ability of existing facilities to accommodate current and projected levels of demand.

Annual airfield operating capacity is defined as the number of aircraft operations that an airfield configuration can accommodate when there is a continuous demand for service (i.e., an aircraft is always waiting to depart or land). This definition is referred to as the ultimate capacity, maximum throughput rate, or annual service volume (ASV). The FAA has developed a methodology that provides a quantifiable measure of an airport's annual operating capacity by estimating its ASV.[2] The estimated ASV for these three airports is presented in Table 6-1.

The calculation of ASV at an airport typically leads to the development of a demand/capacity ratio. As the term implies, this ratio measures the total number of annual aircraft operations at an airport relative to that airport's total ASV. General planning guidelines dictate that when an airport reaches a demand/capacity ratio of 60 percent, or an airport is operating at 60 percent of capacity, planning for capacity enhancement projects should be initiated. A demand/capacity ratio of 80 percent generally indicates that the construction of capacity enhancement projects should be initiated. It should be noted that airports can continue to operate at levels greater than 100 percent of ASV, however, aircraft delay is often significant, especially during peak periods of demand.

As shown in Table 6-1, estimated demand/capacity ratios range from approximately 49 percent at San Marcos Municipal Airport to approximately 86 percent at Georgetown Municipal. The current demand/ratio identified at Austin-Bergstrom International Airport is estimated at 59 percent. These calculations were based on aircraft operations conducted at each airport in 2002. It is reasonable to assume that, based on the projections of regional demand in the study area that

[2] FAA Advisory Circular 150/5060-5, Airport Capacity and Delay

activity levels at these airports will increase. As activity levels increase, so do the airports' demand/capacity ratios.

The findings of this analysis indicate that capacity constraints and congestion and delay issues may already be impacting airport operations at these key airports in the study area. As activity levels increase, additional and potentially more significant impacts would likely be experienced. The construction of a new general aviation airport in the study area, in conjunction with capacity enhancement projects at these airports, may be required during the projection period to adequately accommodate regional demand for general aviation operations, and most notably, operations by the study area's growing based and transient business aircraft fleet.

Expansion Capability

The ability of area airports to expand and/or improve to support future activity levels is another important consideration when examining future facility needs in Central Texas. Airports often need to provide additional facilities and services to meet growing demand, and/or to serve more demanding aircraft. An airport's expansion potential can be assessed from two standpoints, its ability to accommodate additional or improved facilities related to its runway and taxiway system and its ability to accommodate landside facilities such as hangars, aircraft parking aprons, auto parking, FBO facilities, and terminal buildings. In both cases, maintaining and/or acquiring a sufficient land envelope around system airports to support future development needs is important.

The need to provide expanded facilities, however, must be considered in tandem with the human and natural environment. There are several factors that can inhibit or even preclude airport expansion opportunities. These factors include environmental constraints, man-made development, financial limitations, and topographical features. Equally important are public and community commitment to proposed expansion. While many constraints to development can be overcome with investment, the overall cost versus benefit for such expansion must be considered. There are several important factors to consider when examining expansion potential the study area's key airports and they are as follows:

- Austin-Bergstrom International Airport – Although there is significant expansion potential at the airport, the majority of developable land parcels will likely be reserved for future development of additional air carrier and air cargo facilities. During its relatively recent design and construction, providing sufficient land areas to accommodate future developments at the airport was an important consideration. As the region's only commercial service airport, however, development needs of commercial service and air cargo facilities will likely take a higher priority over general aviation development. For instance, during a recent construction project, the area designated to support general aviation facilities at the airport was reduced as the international air cargo apron was expanded to support growing activity levels. Furthermore, fleet mix, safety, and cost concerns would likely limit the interest of the owners of smaller general aviation aircraft in locating at the airport, especially as other options become available. As a result of these factors, it should be assumed the expansion potential at Austin-Bergstrom

International Airport will primarily be devoted to commercial service, cargo and corporate general aviation operators. The airport currently has an excellent area dedicated to general aviation services. While there are nearly 200 aircraft based here, including more than 90 single engine aircraft, operating fleet mix, aircraft storage and service costs, and the controlled airspace environment may limit the long-term attractiveness of the airport to smaller aircraft. The high quality of the facilities (runway, instrumentation/NAVAIDs, ATCT, etc.) in concert with the first class FBO services will also continue to attract based and transient aircraft that are suited to operating in the dynamic airspace that accompanies a growing air carrier facility like Austin-Bergstrom.

- Georgetown Municipal Airport – Georgetown Municipal's excellent facilities (5,000 foot long runway, etc.) and services combined with its location in the fast-growing northern I-35 corridor combined with the recent closure of Austin Executive have contributed to its high level of activity. Current local community conditions, however, effectively limit any additional development at Georgetown Municipal Airport. The City Council and citizens living proximate to the airport are dealing with the recent and rapid growth of airport activity following the closures of Robert Mueller Municipal Airport and Austin Executive Airpark. Negative impacts associated with this growth have resulted in the desire to halt airport development until a new airport master plan is completed. Recommended airport development projects identified in the airport's previous master plan, completed in 1998, are no longer being pursued. Although existing facilities at the airport are capable of accommodating jet aircraft operations, community opposition to such activity will limit the airport's ability to accommodate increased activity and/or develop additional facilities to support greater levels of general aviation activity.

- San Marcos Municipal Airport – San Marcos Municipal currently benefits from having both highly developed airside and landside facilities as well as significant opportunities for expansion. Existing airside facilities and planned improvements will allow the airport to safely accommodate most segments of the general aviation fleet. A wealth of available airport property should be able to accommodate anticipated landside development needs at the airport. With its location well south of the Austin-Bergstrom International Airport, the ability of San Marcos Municipal Airport to serve demand generated in the high growth areas of northern Travis County and Williamson County is limited. This airport is ideally situated, however, to accommodate existing general aviation needs in Hays and Caldwell Counties, and will play an important role in accommodating business and population growth that is anticipated in the area as a result of its location in the center of the Austin-San Antonio corridor.

Development considerations and constraints at these airports may likely impact their ability to adequately accommodate the increased demand projected in the study area. In addition, the location of these airports relative to the demand nodes identified in the study area must also be taken into consideration when examining the ability of these airports to serve the growing demand for business and personal general aviation services.

Aviation Demand Nodes

In order to discuss the ability of the existing airports to accommodate future aviation demand, the study area's primary nodes of demand, located along I-35, will be separated and discussed individually in the following geographic components:

- Central and Southern Travis County
- Northern Travis County and Williamson County
- Hays/Caldwell Counties

Specific attention will be paid to existing infrastructure at study area airports to ensure that they provide sufficient capacity and operational safety margins to accommodate general aviation operations by jet aircraft.

Central/Southern Travis County

Austin is located in central Travis County, and it represents the most densely populated area, in terms of people, pilots, and businesses, in the seven-county study area. Density plots indicate that these are concentrated in and to the north of Austin's central business district. The downtown Austin area is located proximate (approximately 7 miles) to Austin-Bergstrom International Airport, which is capable of accommodating operations by any aircraft, including all types of corporate jet aircraft. While Austin-Bergstrom International's primary role is as an air carrier facility, the airport certainly has available capacity to accommodate new general aviation activity.

As is indicated in Table 6-1, the airport is currently operating at approximately 59 percent of its available capacity. In addition, the airport has a relatively large area dedicated for general aviation development. With this said, the primary general aviation activity that is likely to be accommodated at Austin-Bergstrom International Airport is corporate activity, charter operations, and transient corporate/business flights bound for downtown Austin and areas south of Austin. Activity by smaller aircraft will generally seek other facilities due to the cost of aircraft storage, a very structured airspace environment, and an operating fleet mix consisting of large commercial service aircraft. It should be noted that transient corporate aircraft, especially sophisticated jet aircraft, bound for central Austin and points south will be attracted by the high level of services currently available at Austin-Bergstrom International. Multiple FBO service, rental car facilities, covered storage, security, customs, long runway, an ATCT, and highly precise instrumentation all help attract transient aircraft and pilots with the capabilities to operate in a somewhat congested, controlled airspace. As more and more businesses locate north of Highway 290, however, the northern section of the Travis County will be an increasingly important location related to the demand for general aviation services.

While the Austin-Bergstrom International Airport will continue to serve the entire market area due to the reasons mentioned above, traffic congestion on I-35, travel times via other northern routes, and actual distance will limit the attractiveness of this Airport to the northern portions of the study area. The impacts stemming from vehicular congestion may limit the airport's ability to serve the growing general aviation demand in the growing northern area of Central Texas.

Northern Travis County/Williamson County

Williamson County and areas of northern Travis County have experienced strong demographic growth during recent years. The area from Georgetown to the I-35/Highway 290 intersection is one of the fastest growing corridors in the area. These growth patterns are projected to continue through the study period. A relatively high proportion of the area's major employers are also located in this area. Georgetown Municipal Airport is the only "business class" airport located proximate to this demand node. Georgetown Municipal Airport does have a 5,000-foot long runway capable of accommodating jet aircraft operations. There are no precision approach capabilities at the airport, however, which impacts the ability of the airport to accommodate general aviation activity during periods of low visibility. While the airport has a land envelope that is suitably large enough to accommodate additional landside and airside development, the City of Georgetown is limiting airport expansion due to neighboring residents' concerns regarding noise. Due to this current sentiment, Georgetown Municipal Airport is considered to offer little additional capacity to accommodate the growing demand for aviation services in this high growth area. In addition, the airport is currently operating at more than 86 percent of its ASV. This indicates that there is little additional capacity for aircraft activity without major capacity improvements. Again, considering the current no-growth viewpoint being taken, it is unlikely that a major capacity upgrade, such as a parallel runway, will be considered.

While other general aviation airports exist in the northern portion of the study area, as discussed previously, their location and existing facilities do not readily lend themselves to serve the core demand nodes located along I-35. As discussed in the previous section, there are a number of significant transportation improvements underway in the northern section of Travis and Williamson counties. Several improvements to east-west access will greatly improve traffic flow in this rapidly developing area. In addition, while local community support was not sufficient to move the concept forward, the recent Pflugerville Site Selection Study underscores the demand potential for a new airport in the northern Austin – Georgetown corridor.

Hays/Caldwell County

While the strongest growth for the study area is anticipated in Austin and Williamson counties, Hays and Caldwell county are also experiencing increasing development pressure. Population in these two counties is expected to grow at a rapid pace. As is indicated in Exhibit 6-1, there are a number of businesses that have the propensity to support general services located in the San Marcos/Lockhart area. The density of businesses and population, however, is significantly less than is found in the heavily urbanized areas of north Austin. It is anticipated that San Marcos Municipal's excellent aviation facilities, in addition to Lockhart Municipal, will serve the growing demand for aviation services in this region. San Marcos Municipal is currently operating at just under 50 percent of its available ASV and it has a land envelope that appears to be sufficient to accommodate additional airside and groundside expansion. It is anticipated that aviation demand by business and recreational aircraft in the Hays/Caldwell counties will be adequately served.

Summary

Conservative projections of aviation demand indicate that the study area has the potential to accommodate a significant growth in general aviation activity; 580 based aircraft and more than 270,000 additional general aviation operations over the 20-year planning period. While this demand will undoubtedly be spread throughout the seven county study area, existing and future demographic trends dictate that most of the demand for aviation services will be proximate to the I-35 corridor. An analysis of population, business locations, and current aircraft owners supports the importance of the I-35 corridor. There are three existing airports capable of accommodating business class aircraft on a regular basis (Austin-Bergstrom International, San Marcos Municipal, and Georgetown Municipal) in the study area. Currently these three airports, which are also located along the I-35 corridor, house more than 60 percent of the area's aircraft and accommodate more than 70 percent of the general aviation operations.

A review of conditions at these three airports indicates that operational levels are already significant. Activity at Austin-Bergstrom International is approaching 60 percent of its available capacity, while San Marcos Municipal is nearing 50 percent of its capacity. It should also be noted that Georgetown Municipal is considered to have limited expansion potential based on the current community sentiment regarding airport expansion.

With most of the projected growth for the area anticipated in northern Travis County and Williamson County, there is no business class airport available to accommodate the growing level of aviation demand that this area will generate. As previously noted, Georgetown Municipal reportedly has limited, it any, expansion potential and is already operating at nearly 90 percent of its capacity. While Austin-Bergstrom International has available capacity and landside expansion potential, its primary focus will be on commercial service activities. The surrounding Class C airspace and costs associated with storing aircraft at the airport may detract many operators of smaller aircraft that do not require Austin-Bergstrom's facilities and level of service. In addition, increasing congestion on I-35 and other major thoroughfares will limit the attractiveness of Austin-Bergstrom to provide access to the northern potion of the service area.

Based on the above conclusions, a new general aviation airport appears warranted if a location can be determined that serves the primary demand corridor (I-35) through the study area. The high growth northern portion of the study area (along the I-35 corridor) is currently underserved and may present the best opportunity from a "proximity to demand" standpoint. Additional considerations, such as available land, environmental impacts, etc. will have to be considered before any final conclusions can be drawn.

CHAPTER SEVEN
FACILITY TEMPLATE

Data compiled through a survey of registered aircraft owners in the study area, airport visits, an examination of business and corporate aviation in the Central Texas study area, and the projections of regional demand indicate that a new general aviation facility, with the proper location, is warranted. The potential new airport would be anticipated to primarily serve new and growing aviation demand identified for the study area. In addition, the new airport could also improve landside and airside accessibility for the current aircraft owners and businesses using general aviation aircraft in the study area.

The facility template analysis will identify the general layout and level of airport facilities that would allow a new general aviation airport in Central Texas to best serve anticipated levels and types of demand. It is important to note that more detailed analyses of potentials sites, required facilities, and optimal layouts of the new airport will be conducted in following phases of this study, prior to any design or construction of facilities. A detailed master plan will be required to match any selected site with specific facilities. The information contained in this chapter however, sets the groundwork for the follow-on site selection and master plan.

The facility template for a new general aviation airport in Central Texas assumes that a suitable location can be found. As indicated in the previous chapter, a location proximate to the high growth areas along the I-35 corridor, particularly in the Travis and Williamson county area, will greatly aid the ability of a new airport to capture the growing regional demand. It should be noted that the identification of needed facilities does not constitute a "requirement" in terms of absolute design standards or goals, but rather the preferred development alternatives for the new facility, given financial, environmental, and other constraints that have yet been determined. Facility needs, both airside and landside, will also be identified for a new facility based on anticipated levels and types of demand, as well as the anticipated role of the new airport in the regional airport system. FAA design standards, as outlined in Advisory Circular 150/5300-13, Airport Design, serve as the basis of developing a facility template. An additional consideration in the development of facility template is the identification of the new airport's "critical aircraft."

Critical Aircraft

Facility needs of a potential new general aviation airport in Central Texas are determined by using applicable FAA standards and requirements for various airside and landside components. The planning and design of an airport are based on the airport's intended role, projected activity levels, and the "critical" aircraft that uses the facility. The critical, or design, aircraft is typically defined as the most demanding aircraft, or class of aircraft, that operates at an airport on a regular basis. Typically, an aircraft or type of aircraft must conduct 500 or more annual operations at the airport for it to be considered the facility's critical aircraft. The physical and operational characteristics of an airport's design aircraft are important factors in the planning and design of that airport.

The FAA provides guidance for planning and design of airport facilities through FAA Advisory Circulars that promote airport safety, economy, efficiency, and longevity. Information from FAA Advisory Circular 150/5300-13, "Airport Design," was used to relate the potential new airport's critical aircraft to airport planning and design standards for the airport based on the facility's anticipated Airport Reference Code (ARC). The ARC is a coding system used by the FAA to relate airport design criteria to the operational and physical characteristics of the aircraft fleet anticipated to operate at an airport.

An airport's ARC is comprised of two components that relate it's planning and design to the critical aircraft. The first component, depicted by a letter, is the aircraft approach category, as determined by the approach speed of the critical aircraft. **Table 7-1** summarizes FAA approach category classification criteria.

Table 7-1
Aircraft Approach Category Classification

Approach Category	Approach Speed (knots)	Typical Aircraft
A	Less than 91	Beech Baron 55, Cessna 172
B	91 but less than 121	King Air, Citation II, Citation Ultra
C	121 but less than 141	Lear 25, Gulfstream III
D	141 but less than 166	Gulfstream II, IV, V
E	166 or greater	Blackbird 71, Tupolev 144

Source: FAA Advisory Circular 150/5300-13, "Airport Design"

The second ARC component, depicted by a Roman numeral, is the airplane design group, as determined by the wingspan of the airport's critical aircraft. FAA airplane design group classification criteria are summarized in **Table 7-2**.

Table 7-2
Airplane Design Group Classification

Approach Category	Wingspan (feet)	Typical Aircraft
I	Less than 49	Cessna 172, Piper PA-23, Cessna 401, Cessna 414
II	49 but less than 79	Falcon 50, Beech King Air E-90, Citation II, Gulfstream III
III	79 but less than 118	Dash 8, Convair 580, Gulfstream V
IV	118 but less than 171	Airbus 300, Boeing 707, Boeing 757, Boeing 767, Lockheed 1011, DC-10
V	171 but less than 197	B-747
VI	197 but less than 262	Blackbird 71, Tupolev 144

Source: FAA Advisory Circular 150/5300-13, "Airport Design"

In the planning and design of an airport, runway and runway related facilities are typically driven by the airport's approach category classification and the approach speed of its critical aircraft. Separation criteria for taxiways and other facilities relate to the airplane design group component of the airport's ARC, determined by the wingspan of the critical aircraft.

To be considered as an airport's critical aircraft, a specific type of aircraft or family of aircraft, must annually perform 250 landings (500 total operations) at that facility. While most aircraft operating in the study area are small single engine aircraft weighing less than 12,500 pounds, there are numerous larger based aircraft in the Central Texas study area. In addition, larger corporate jet aircraft conduct many transient operations in the study area. The operating characteristics of jet aircraft with relatively high approach speeds, tend to result in their being the critical aircraft at those airports where they frequently operate. Based aircraft statistics for the study area airports indicate that 34 jets are currently based in the region. A database of study area based aircraft indicates that the based jet fleet mix in the study area range includes Cessna Citations (ARC of B-I), Falcon 50 (ARC – B-II), and Gulfstream III aircraft (ARC of C-II). Transient aircraft that frequent the region include all types of general aviation aircraft up to and including Gulfstream IV and V (ARC D-II) and the Boeing Business Jet (ARC C-III). The projections of regional demand for the study area estimated that the region's number of based jets would increase from approximately 30 to more than 80 aircraft by 2022.

The future based aircraft fleet mix in the study area is anticipated to remain similar to the current fleet mix with several notable exceptions. The national fleet of active jet aircraft is anticipated to experience growth in both ends of the spectrum, small personal jet aircraft, such as the Cessna Citation Mustang, as well as large corporate jet aircraft such as the Boeing Business Jet. For a new general aviation airport in the Central Texas region to be able to accommodate operations by the current and anticipated future jet aircraft fleet mix, it is reasonable to assume that the facility would ultimately support Approach Category D aircraft such as the Gulfstream IV and V. Design Group III aircraft such as the Boeing Business Jet and Global Express can also be anticipated. An ARC D-III appears to be warranted. The D-III ARC would allow the facility to safely and efficiently accommodate the majority of current and anticipated future active jet aircraft in the nation's fleet

The ARC relates to a number of design standards that govern airport development. **Table 7-3** presents the various standards for an airport with a D-III ARC. Additional discussion of these standards will be contained in the following text.

Airport Design Standards

Table 7-3 presents a number of FAA required design standards for an airport accommodating C/D-III aircraft. Compliance with airport design standards is required to maintain a minimum level of operational safety.

Table 7-3
FAA Design Criteria

Criteria	Dimension (in feet)
Runway Width	100
Runway Centerline to: -Taxiway Centerline -Aircraft Parking Area	 400 500
Runway Object Free Area (OFA) -Width -Length Beyond Runway End	 800 1,000
Runway Safety Area (RSA) -Width -Length Beyond Runway End	 500 1,000
Taxiway Width	50
Taxiway Centerline to: -Parallel Taxiway Centerline -Fixed or Moveable Object	 152 93
Taxiway Object Free Area (Width)	186
Taxilane Object Free Area (Width)	162
Taxiway Safety Area (Width)	118
Runway Blast Pad -Length -Width	 200 140

Source: FAA Advisory Circular 150/5300-13 "Airport Design"

The major airport design elements, as follows, are established from FAA Advisory Circular 150/5300-13, Change #7, Airport Design. General definitions of these standards are as follows.

Runway Safety Area (RSA): The RSA is a two-dimensional area surrounding, and extending beyond, the runway and taxiway centerlines. This safety area is provided to reduce the risk of damage to airplanes in case of an undershoot, overshoot, or excursion from the runway. Under dry conditions, the RSA must support an airplane without causing structural damage to the airplane or injury to the occupants. The runway and taxiway safety areas must be cleared and free of objects except those required for air-navigation, and graded to transverse and longitudinal standards to prevent water accumulation, as consistent with local drainage requirements. The airport must own the entire RSA in fee simple.

Object Free Area (OFA): The OFA is a two-dimensional area surrounding runways, taxiways and taxilanes. It must remain clear of objects except those used for air navigation or aircraft ground maneuvering purposes, and requires clearing of aboveground objects protruding higher than the runway safety area edge elevation. An object is considered any ground structure, navigational aid, people, equipment, terrain or parked aircraft. The airport must own the entire OFA in fee simple.

Runway Protection Zone (RPZ): The RPZ is a two-dimensional trapezoid area beginning 200 feet beyond the paved runway end, and extending along the runway centerline. The purpose of the RPZ is to enhance the protection of people and property on the ground, and to prevent obstructions potentially hazardous to aircraft. The RPZ size is determined by the type of airplanes expected to operate at the airport (small or large) and the type of approach planned for the runway ends (visual; non-precision not lower than 1-mile; ¾-mile; or lower than ¾-mile). The recommended visibility minimums for the runway ends were determined with consideration of needed approach procedures, the ultimate runway ARC, airfield design standards, instrument meteorological wind conditions, and physical constraints (approach slope clearance) beyond the extended runway centerline. The FAA recommends that airports own the RPZ property in fee simple, and that the RPZ be clear of any non-aeronautical structure or object that would interfere with the arrival and departure of aircraft. Avigation easements, at a minimum, should be obtained to control the use of property and airspace within the RPZ and approach surface when fee simple ownership is not possible (beyond natural and man-made barriers such as roads). Typically, aviation/avigation easements vary upon the extent to which they restrict structures, control right-of-way entry, and limit electromagnetic interference.

Obstacle Free Zone (OFZ): The OFZ is airspace above a surface centered on the runway centerline, and precludes taxiing and parked airplanes, and object penetrations except for frangible post mounted NAVAIDs expressly located in the OFZ by function. The runway, inner transitional and inner approach OFZ are applicable ultimate design requirements with the installation of an approach lighting system or the establishment of precision approach capabilities.

Runway System

Runway system requirements needed to meet projected aviation demand at a new airport through the 20-year planning period were identified based on the types and numbers of aircraft that are projected to frequently use the runway system. All airside facilities at the airport should be designed in accordance with the standards developed by the FAA, using the ARC system previously discussed. In the future, any improvements to the airfield should incorporate these standards, except in cases where existing conditions make it impossible to provide fully conforming facilities. ARC D-III design standards may also be exceeded in certain circumstances.

Runway length requirements are determined by analyzing the needs of the airport's design aircraft. The recommended length for the primary runway is determined by considering a specific airplane that is forecast to use the runway on a regular basis or by considering a family of aircraft having similar performance characteristics. FAA standards consider the threshold to be at least 500 operations per year. While the runway length required for both departures and landings was considered, only departure length is discussed since the analysis determined that departure length is the most critical.

Table 7-4 presents the runway length requirements, using the FAA Design Computer Program, based on the Airport elevation of 600 feet above mean sea level (AMSL) and the mean maximum temperature of 92 degrees F for the hottest month of the year. The runway length requirement ranges from approximately 4,410 feet for small airplanes with 10 seats or more (aircraft with maximum takeoff weights of 12,500 pounds or less). Large airplanes with maximum takeoff weights of 60,000 pounds or less can require a runway length ranging up to 8,910 feet.

Table 7-4
Runway Length Requirements

Airport and Runway Data	
Airport Elevation	600 Feet
Mean Maximum Temperature of the hottest month	92.0 F
Maximum difference in runway centerline elevation	10 Foot
Length of haul for airplanes of more than 60,000 pounds	1,500 Miles
Runway Lengths Recommended For Airport Design	
Small airplanes with 10 or more passengers	4,410 Ft.
Large airplanes of 60,000 pounds or less:	
75 percent of these airplanes at 60 percent useful load	5,500 Ft.
75 percent of these airplanes at 90 percent useful load	7,000 Ft.
100 percent of these airplanes at 60 percent useful load	5,790 Ft.
100 percent of these airplanes at 90 percent useful load	8,910 Ft.
Airplanes of more than 60,000 pounds	7,100 Ft.

Source: WSA Analysis, FAA AC 150/5325-4A, Runway Length Requirements for Airport Design

Based on the above analysis, as calculated by the FAA Runway Length Requirements program, a runway length of 5,500 feet will accommodate 75 percent of the aircraft fleet weighing between 12,500 pounds and 60,000 pounds at 60 percent useful load. This size aircraft corresponds to most of the corporate aircraft fleet including Lears, Gulfstream II and IIIs, Falcons, and Citations. For these same aircraft to operate a higher useful load, which often corresponds to flying longer stage lengths, a runway length of 7,000 feet is recommended. In addition, to accommodate aircraft of greater than 60,000 pounds (Gulfstream IV, V, and Global Express, etc.), a recommended runway length of 7,100 feet is produced. It should be noted that these lengths account for wet/slippery runway conditions, which provides an added margin of safety.

It may be necessary to phase runway development due to availability of funding, actual demand or critical aircraft at time of construction, etc. If the runway development is phased, the minimum first phase of development should be 5,500 feet with an ultimate development of 7,000 feet justified.

A runway width of 100 feet should be provided to meet D-III ARC standards.

Taxiway System

Taxiways enhance operational safety and provide additional airfield capacity. As airport activity increases (takeoffs and landings), the taxiway system should, by design, provide efficient access between the runway environment and terminal area, and other landside areas.

For planning purposes, a full-length parallel taxiway system is typically recommended for an airport upon reaching 20,000 annual operations. While activity projections for a new general aviation airport in the study area have not be specifically identified at this point of the study, the 20,000 annual operations threshold is relatively low and a new facility would be anticipated to reach that threshold in the near-term. The exit taxiway should provide direct access to the terminal area, with the parallel taxiway having multiple exit taxiways.

Approaches/Lighting

It is recommended that a new airport be designed to accommodate a precision approach with visibility minimums of less than ¾ mile. This will allow properly equipped aircraft the ability to operate at the airport in most weather conditions. In addition, the runway should be equipped with high intensity runway lighting (HIRL) and approach lighting. Other lighting and navigational aids will be discussed in the airport's master plan.

Land Envelope

In order to accommodate a runway of at least 7,000 feet a relatively level area extending nearly two miles will be required. In addition to the actual runway, there are several FAA requirements and safety guidelines that must be accommodated. A RPZ 2,500 feet in length should be included to accommodate a precision approach. This trapezoid is intended to promote compatible land uses off each runway end. A 1,700-foot RPZ can be anticipated on the opposite runway end. When two RPZs are added to the 7,000-foot runway, a total land envelope of 11,600 feet is required.[1] At a minimum, the land envelope should be 1,750 feet in width to accommodate the outer width of the RPZ. In addition, areas should be reserved for additional airport development, including hangars, apron, terminal area, auto parking, access road, and other airport-related or compatible development. At a minimum, a land envelope of approximately 750 acres is anticipated. Additional property may be warranted

[1] This includes a 200-foot area of the primary surface located between the end of the pavement and the start of the RPZ at each end.

based on the potential for additional industrial development, the number of parcels and size of selected parcels, etc.

Other Facilities

Other facilities that are recommended for a new Central Texas Airport include:

- Access road
- Auto parking
- GA terminal building
- Aircraft storage (T-hangars, conventional hangars, apron)
- Air traffic control tower (when demand warrants)
- Security fencing
- Lighting/signage/various Navids
- Fuel farm

A more detailed facilities requirement evaluation will be contained in the site specific airport master plan.

Facility Template Summary

Through this analysis a facility template has been developed for a new general aviation airport in Central Texas. **Exhibit 7-1** presents a general layout of the type of facility envisioned. It is important to note that this template will continue to be refined through the Site Selection and Master Plan phases of this study, and will be adapted to meet the specific features of the selected site. The new general aviation airport's basic facility template is summarized as follows:

- 7,000 X 100 foot ultimate runway
- Precision approach
- ARC D-III design standards
- Parallel taxiway
- Aircraft storage and other aviation facilities
- Land envelope of approximately 750 acres (minimum)

Following sections of this analysis will develop preliminary cost estimates for the identified facility template and will examine the relative feasibility of the project.

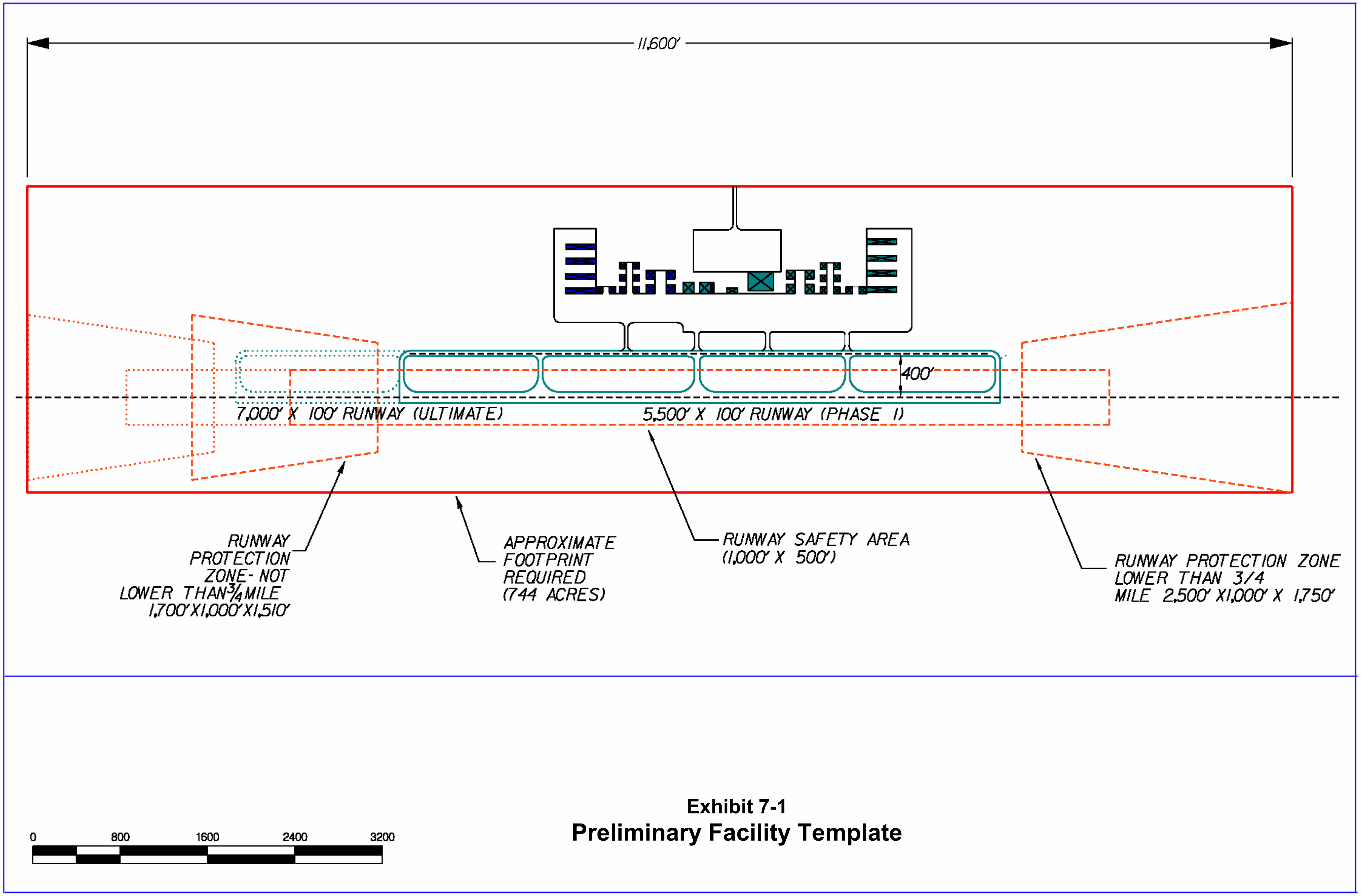


Exhibit 7-1
Preliminary Facility Template

CHAPTER EIGHT
PRELIMINARY COST ESTIMATES

Introduction

This chapter details the estimated development costs of a new general aviation airport in Central Texas. Previous chapters of this analysis identified that sufficient general aviation demand exists within the study area to support the construction of a new general aviation airport. Chapter Seven provides a facility template for the new airport that illustrates the facility requirements necessary to support components of the region's general aviation fleet that appear to be inadequately served by existing general aviation facilities. Development projects necessary to support the establishment of a new general aviation airport based on the needs represented in the facility template are summarized in the following sections:

- Estimated Development Costs
- Overview of Airport Development Funding Sources
- Potential Funding Sources

The estimated development costs of a new general aviation are identified by major facility/project category. These estimated development costs represent planning level estimates of project cost and are intended to provide an order of magnitude estimate. More detailed project definitions and associated cost estimates would be required prior to the implementation of any airport development project identified herein.

Common sources of airport development funding are summarized in this chapter and a preliminary funding analysis is also presented. The funding analysis illustrates anticipated funding contributions from Federal, State, local, and private sources based on typical airport development funding scenarios.

Estimated Development Costs

The construction of a new general aviation airport in Central Texas would be a multi-year task that could only be initiated following detailed analyses that could include benefit/cost studies, land acquisition, environmental permitting, and potential environmental mitigation. At this point in the Central Texas Site Selection Study, however, it is important to develop an order-of-magnitude cost estimate, at a planning level of detail, for the potential airport development project. While the estimated development costs identified in this analysis may not be all-inclusive, to the best extent possible these estimates include development costs associated with major components of the potential project. Costs were estimated using region-specific average unit costs for airport development projects. It is important to note that in addition to design, engineering, and construction costs, a 15 percent contingency allowance was included in all unit costs to cover unexpected costs of construction.

Estimated project costs for each of these components are presented in **Table 8-1**.

Table 8-1
Estimated Development Costs

Feature	Unit Cost (Includes 15% for Contingencies)	Unit	Total Units	Total Estimated Feature Cost
Property Acquisition (744 Acres)	$20,000	Acre	744	**$14,880,000**
Airfield Construction				
Clearing and Grubbing	1,800	Acre	555	999,000
Grading	6,000	Acre	555	3,330,000
Drainage	2,500	Acre	555	1,387,500
Runway (7,000'x100')	11	SF	700,000	7,700,000
Parallel Taxiway & Connectors	11	SF	450,000	4,950,000
Aircraft Parking Apron	11	SF	800,000	8,800,000
Design/Engineering				5,466,000
Airfield Construction Projects Total				**$32,632,500**
NAVAIDs/Lighting				
ILS/MALSR	1,150,000	each	1	1,150,000
PAPIs (GVGI)	50,000	4 box package	2	100,000
REILs	50,000	each	1	50,000
HIRL	12	LF	14,000	168,000
MITL	12	LF	14,200	170,400
AWOS	1	each	160,000	160,000
Beacon	75,000	each	1	75,000
Lighted Windsock	12,000	each	1	12,000
Airfield Signage	150,000	sign package	1	150,000
Electrical Vault	75,000	each	1	75,000
Design/Engineering				253,600
NAVAIDs/Lighting Projects Total				**$2,364,000**
Landside				
Access Roadway	125	SF	3,600	450,000
Security Fencing	9	LF	28,767	258,900
Design/Engineering				92,200
Landside Projects Total				**$801,100**

Table 8-1
Estimated Development Costs (cont.)

Terminal Area Development				
Auto Parking	1,750	space	200	350,000
Terminal Building	175	SF	12,000	2,100,000
FBO Building	175	SF	2,000	350,000
Maintenance Hangars	125,000	each	1	125,000
Corporate Hangars	75,000	each	8	600,000
Conventional Hangars	50,000	each	16	800,000
T-Hangars (12 Unit)	360,000	each	8	2,880,000
Utilities	500,000	util. package	1	500,000
Fuel Farm	58,000	each	1	58,000
Design/Engineering				1,009,200
Terminal Area Projects Total				**8,772,200**
Total Estimated Development Costs				**$59,449,800**

As shown in Table 8-1, total development costs for a new general aviation airport based on the facility template are estimated at approximately $59.4 million. Estimated development costs for the following major components of the construction are as follows:

- Property Acquisition - $14.9 million
- Airfield Construction Projects - $32.6 million
- NAVAIDs/Lighting Projects - $2.4 million
- Landside Projects - $801,100
- Terminal Area Development Projects $8.8 million

It is estimated that property acquisition would entail the purchase of a land area totaling over 740 acres to accommodate aviation-related facilities and associated safety areas. It may be necessary and/or beneficial to acquire a larger land area to provide airport-owned property that would be available to support non-aviation development, such as an industrial park or other commercial development. The actual size and number of actual parcels may also effect the final land envelope to be acquired. No costs were included in this analysis for land acquisition costs in excess of the 740 acres estimated to be required for aviation-related development.

The largest component of the potential facility's estimated development costs is associated with airfield construction projects. Clearing, grading, and drainage costs associated with the construction of a 7,000' by 100' runway, its supporting full-length parallel taxiway, and aircraft parking areas are included in the total estimated airfield construction costs of approximately $32.6 million. Terminal area development projects, including the construction of an airport terminal building, FBO building, and aircraft storage hangars, along with associated utilities, are estimated to cost approximately $8.8 million. Combined, NAVAID and Lighting projects required to support aircraft operations and landside projects required for vehicular access and perimeter security have an estimated development cost of approximately $3.2 million.

The development costs associated with projects presented in Table 8-1 are eligible for funding from a variety of sources. Anticipated funding sources for these development projects will be summarized in the following section and total funding anticipated from each source will be quantified.

Overview of Airport Development Funding Sources

At a planning-level of detail, required projects and their estimated development costs have been identified for the construction of a new general aviation airport in Central Texas. Another important consideration in this analysis is the funding eligibility and potential funding sources for these development projects. Federal, state, and local governments all play an important role in managing and funding airport facility development. In addition, private businesses and individuals often contribute to the construction of ancillary airport facilities that support their own activities at the airport. Primary funding sources available to support airport development projects include the following:

- Federal Aviation Administration (FAA) Funding
- Texas Department of Transportation (TxDOT)
- Local/Private Funding Source
- Innovative Financing

Each of these potential funding sources and their respective programs for funding airport development projects will be summarized in following sections.

It is also important to note that variety of other sources may also be available to fund components of development projects and/or defray costs associated with the construction of a new general aviation airport in Central Texas. While anticipated funding from these other sources is not quantified, examples of innovative funding sources will be presented. In many cases, using innovative funding techniques could significantly reduce the local/private share of project costs associated with the development of a new Central Texas airport.

Federal Aviation Administration (FAA) Funding

To promote the development of airports to meet the nation's needs, the Federal Government embarked on a Grants-In-Aid Program to units of State and local government after the end of World War II. This early program, the Federal Aid Airport Program (FAAP), was authorized by the Federal Treasury Act of 1946 and was provided its funding from the Treasury.

In 1970, a more comprehensive program was established with the passage of the Airport and Airway Development Act of 1970. This Act provided grants for airport planning under the Planning Grant Program (PGP) and for airport development under the Airport Development Aid Program (ADAP). These programs were funded from a newly established Airport and Airway

Trust Fund, which received funds from taxes on airline tickets, air freight, and aviation fuel. The authority to issue grants under these two programs expired on September 30, 1981. During this 11-year period (1970-1981), a total of 8,809 grants were awarded for a total of $4.5 billion for airport planning and development.

The Airport Improvement Program (AIP) was established by the Airport and Airway Improvement Act of 1982. The initial AIP provided funding legislation through fiscal year 1992. Since then, the AIP has been authorized and appropriated on a yearly basis. Funding for this program is generated from a tax on airline tickets, freight way bills, international departure fees, tax on general aviation fuel, and a tax on aviation jet fuel. The FAA uses these funds to provide 90 percent funding for eligible projects at qualified airports. Federal Airport Improvement Funds must be spent on FAA eligible projects as defined in FAA Order 5100.38 “Airport Improvement Program (AIP) Handbook.” In general, the handbook states that:

- An airport must be in the currently approved National Plan of Integrated Airport Systems (NPIAS) to be eligible for AIP funding
- To be eligible for Federal funding, an improvement project at a NPIAS airport must be depicted on an FAA-approved Airport Layout Plan
- Most improvement projects at NPIAS airports are eligible for 90 percent Federal funding
- General aviation terminal buildings, T-hangars, and corporate hangars and other private-use facilities are not eligible for Federal Funding. In addition, revenue-producing items such as automobile parking lots are typically not eligible for Federal Funding

Other sources of FAA funding include Facilities and Equipment (F&E) funding for facilities such as air traffic control towers and some runway instrumentation. This funding is separate from the AIP program and typically requires no local match. Federal noise funds (Part 150 funds) can also be used for noise mitigation, where applicable, with an 80 percent Federal and a 20 percent State and/or local share.

Texas Department of Transportation (TxDOT)

Many state governments take an active role in supporting airport development by providing funding to support a share of airport project costs. The State of Texas is one of those states that play a vital role in promoting and financially supporting airport development at its airports. In most cases, state’s collect moneys through aviation and aeronautics-related taxes that are then disbursed to support airport development projects based on airport needs and state-specific funding priorities. As a Block Grant state, the Texas Department of Transportation is responsible for determining how to distribute AIP grants to eligible NPIAS airports, excluding primary air carrier airports whose grant funding is managed by the FAA. In distributing AIP grants to eligible airports, TxDOT is required to use a prioritization process that is generally in accordance with the FAA’s process, however, the Block Grant program enables TxDOT to play a more active role in promoting and managing airport system development throughout Texas. In the following funding analysis, AIP funding managed and distributed by TxDOT will be categorized as Federal/State funding.

Local/Private Funding Source

Local airport owners and sponsors, such as counties, cities, and/or airport authorities, are frequently responsible for costs associated with airport development projects that remain after Federal and State shares have been applied. Private sector investment is also growing source of funding for airport development projects. In some cases, specific facilities at an airport, such as aircraft storage hangars and fuel storage/distribution facilities are constructed with private finances. These facilities are typically constructed on lands leased from the airport and a private developer retains the right to operate and profit from the facility that is constructed. For those projects that are eligible for Federal/State funds, the local/private share of project costs is typically 10 percent. For projects not eligible for AIP funding, the local/private funding requirement can be as great as 100 percent of project costs.

Innovative Financing

As a result of scarcities in traditional Federal, State, and local funding sources, many airports, especially general aviation airports and their sponsors, have resorted to innovative and non-traditional traditional funding sources to mitigate airport development project funding shortfalls. There are a variety of non-traditional sources at all levels of government that can be used to leverage local funds in support of airport development projects. Strong community relations and ties with the local municipality in which the airport operates, however, are vital to successfully taking advantage of the innovative financing opportunities that may exist.

Examples of Federal programs that have successfully been used to provide non-traditional funding for airport development projects include:

- Community Development Block grants and loans through the U.S. Department of Housing and Urban Development (HUD)
- Economic Development Assistance (EDA) grants and loans through the Department of Commerce, Economic Development Administration
- Rural Economic Development grants and loans through the U.S. Department of Agriculture (USDA)

In addition to these Federal programs, there may be other State and local programs that should be examined as potential avenues for project funding. While estimated funding from innovative funding sources is not quantified in this analysis, successfully acquiring funding from these sources, and leveraging local or private funding against those grants or loans, could significantly reduce the funding burden of both local and private funding sources.

Potential Funding Sources

Airport facility needs and the estimated project costs have been estimated at a planning level of detail for the construction of a new general aviation airport in Central Texas. To determine anticipated funding sources, each project was examined to determine its eligibility for funding from Federal, State, and local sources. The results of this analysis are summarized in **Table 8-2** which presents preliminary estimates of funding by source for the estimated project costs identified in this analysis.

Table 8-2
Anticipated Funding Sources

	Funding Source		
Feature	**Federal/State**	**Local/Private**	**Total Estimated Feature Cost**
Property Acquisition (744 Acres)	$13,392,000	$1,488,000	**$14,880,000**
Airfield Construction			
Clearing and Grubbing	899,100	99,900	999,000
Grading	2,997,000	333,000	3,330,000
Drainage	1,248,750	138,750	1,387,500
Runway (7,000'x100')	6,930,000	770,000	7,700,000
Parallel Taxiway & Connectors	4,455,000	495,000	4,950,000
Aircraft Parking Apron	4,400,000	4,400,000	8,800,000
Design/Engineering	4,919,400	546,600	5,466,000
Airfield Construction Projects Total	**$25,849,250**	**$6,783,250**	**$32,632,500**
NAVAIDs/Lighting			
ILS/MALSR	1,035,000	115,000	1,150,000
PAPIs (GVGI)	90,000	10,000	100,000
REILs	45,000	5,000	50,000
HIRL	151,200	16,800	168,000
MITL	153,360	17,040	170,400
AWOS	120,000	40,000	160,000
Beacon	67,500	7,500	75,000
Lighted Windsock	10,800	1,200	12,000
Airfield Signage	135,000	15,000	150,000
Electrical Vault	67,500	7,500	75,000
Design/Engineering	228,240	25,360	253,600
NAVAIDs/Lighting Projects Total	**$2,103,600**	**$260,400**	**$2,364,000**
Landside			
Access Roadway	0	450,000	450,000
Security Fencing	0	258,900	258,900
Design/Engineering	0	92,200	92,200
Landside Projects Total	**$0**	**$801,100**	**$801,100**

Table 8-2
Anticipated Funding Sources

	Funding Source		
Feature	**Federal/State**	**Local/Private**	**Total Estimated Feature Cost**
Terminal Development			
Auto Parking	175,000	175,000	350,000
Terminal Building	1,050,000	1,050,000	2,100,000
FBO Building	0	350,000	350,000
Maintenance Hangars	0	125,000	125,000
Corporate Hangars	0	600,000	600,000
Conventional Hangars	0	800,000	800,000
T-Hangars (12 Unit)	0	2,880,000	2,880,000
Utilities	0	500,000	500,000
Fuel Farm	0	58,000	58,000
Design/Engineering	0	1,009,200	1,009,200
Terminal Development Projects Total	**$1,225,000**	**$7,547,200**	**$8,772,200**
Total Estimated Development Costs	**$42,569,850**	**$16,879,950**	**$59,449,800**

As shown in Table 8-2, landside and most terminal area development projects are not typically eligible for Federal/State funding. With the exception of terminal building and auto parking project costs, which are eligible for 50 percent Federal/State funding, it is anticipated that landside and terminal development projects would primary be funded from local/private sources. All other projects, those associated with property acquisition, airfield development, and NAVAIDs/lighting, would be eligible for Federal/State funding for up to 90 percent of total project costs. The remaining share of costs for those Federal/State eligible projects would be funded from local/private funding sources.

Of the airport's total estimated development cost of approximately $59.4 million, approximately $42.6 million is anticipated to be funded through the FAA AIP shown in this analysis as Federal/State sources. The remaining $14.1 million of estimated project costs would be funded from local and/or private sources. Non-traditional funding sources may also provide a source of funds through local funding requirements could be leveraged, thereby reducing the total amount of local/private funding required.

Summary

The estimated costs of airport development projects associated with the construction of a new general aviation airport in Central Texas have been identified in this analysis. These estimated project costs have been developed to provide an order-of-magnitude estimate of development costs, actual development costs may be higher or lower than estimated herein. Prior to the initiation of any project associated with the new airport, a thorough analysis of the recommended site will conducted and the results will be used to develop design and engineering specifications for the new facility after which a more detailed analysis of estimated development costs can be developed.

Estimated airport development costs identified in this analysis are summarized in **Table 8-3**.

Table 8-3
Estimated Development Costs - Summary

Feature	Total Estimated Cost	Percentage
Property Acquisition (744 Acres)	$14,880,000	25%
Airfield Construction Projects Total	$32,632,500	55%
NAVAIDs/Lighting Projects Total	$2,364,000	4%
Landside Projects Total	$801,100	1%
Terminal Area Development Projects Total	8,772,200	15%
Total Estimated Development Costs	**$59,449,800**	**100%**

The cost estimates developed for this analysis are based on the facility template identified in Chapter Seven, which included a 7,000-foot long runway with a parallel taxiway and a precision approach. As shown in Table 8-3, the estimated development cost of the template facility totals approximately $59.4 million. Approximately 55% of the estimated development costs would be associated with the construction of airfield facilities.

Anticipated funding sources for the estimated development costs were also examined in this analysis. **Table 8-4** summarizes anticipated funding sources by major project type.

Table 8-4
Anticipated Funding Sources - Summary

Feature	Federal/State	Local/Private	Total Estimated Feature Cost
Property Acquisition (744 Acres)	$13,392,000	$1,488,000	$14,880,000
Airfield Construction Projects Total	$25,849,250	$6,783,250	$32,632,500
NAVAIDs/Lighting Projects Total	$2,103,600	$260,400	$2,364,000
Landside Projects Total	$0	$801,100	$801,100
Terminal Area Development Projects Total	$1,225,000	$7,547,200	$8,772,200
Total Estimated Development Costs	**$42,569,850**	**$16,879,950**	**$59,449,800**

As shown in Table 8-4, costs associated with landside development, primarily consisting or roadway construction, at the airport would not be eligible for Federal/State funding and would be anticipated to be funded from local and/or private sources. All other project categories would be funded through a mix of Federal/State and local/private funding sources, with the majority of funding in these categories coming from Federal/State sources. A summary of anticipated funding eligibility for total airport development project costs identified in this analysis is presented in **Table 8-5**.

Table 8-5
Estimated Funding Eligibility

Funding Source	Amount	Percentage
Federal/State	$42,569,850	72%
Local/Private	$16,879,950	28%
Total Estimated Development Costs	**$59,449,800**	**100%**

Total estimated development costs for a new general aviation airport in Central Texas are estimated at approximately $59.4 million, of which an estimated 72 percent, or approximately $42.6 million would be eligible for Federal/State funding. The remaining 28 percent of total estimated development costs would be funded through local, private, and/or non-traditional funding sources.

CHAPTER NINE
FINANCIAL FEASIBILITY

An important consideration in the development of a new general aviation airport in Central Texas is the potential for that facility to be financially feasible, both in terms of capital development costs as well as long-term self-sufficiency with regards to operating revenues and expenses. Preliminary cost estimates have been identified for the infrastructure development associated with recommended facilities at a new general aviation airport in Central Texas. Potential funding sources for these infrastructure development costs were summarized in a previous section of this report. The following sections of the report will examine the potential for the new general aviation airport to be self-sufficient, meaning that on an annual basis, operating revenues at the airport would cover the operating expenses of the facility:

- Airport Self-Sufficiency Overview
- National Analysis of Airport Profitability
- Implications for the Central Texas Regional Airport
- Summary

For a new airport in Central Texas to be considered financially feasible, in the long-run, it is important to understand the potential of that facility to be self-sufficient in terms of operating revenues and expenses.

Airport Self-Sufficiency Overview

Generating adequate airport revenues to cover operating and maintenance costs and capital investment needs while at the same time maintaining and expanding the airport's tenant and user base is typically one of the most important and most challenging issues facing general aviation airport operators. Airports, like many other components of public transportation systems, are often subsidized by their public sponsors. The level of subsidy required to support a general aviation airport varies significantly by facility. Airport size and infrastructure, activity levels, and role are just a few of the factors that impact a facility's ability to generate sufficient airport revenues to fund operating expenses.

To some extent, the non-quantifiable benefits that general aviation airports provide to their local communities are an important consideration when examining airport sulf-sufficiency and subsidies. Economic development, community relations, and recreational opportunities that general aviation airports typically provide are often considered invaluable to those communities and their residents. Many public airport sponsors understand the importance of these non-quantifiable benefits to their communities and are willing to subsidize, at varying levels, the airport's operations. In the current fiscal environment, however, the willingness and/or abilities of many public sponsors to subsidize general aviation airport operations can be limited. During periods of reduced municipal and State budgets, general aviation airports are often competing with a number of other public services for funding, and airports often receive a lower funding priority.

The following sections will examine general aviation airport operating revenues, expenses, and required subsidies as well as characteristics that promote airport self-sufficiency. Based on general airport analysis, as well as real-world airport data, the potential for a new general aviation airport in Central Texas to operate as a self-sufficient entity will be identified. Airport self-sufficiency and the potential for a new airport in the study area to be self-sufficient will be examined in the following sections. It should be noted that, while many airports throughout the nation and in the study area do require some level of public subsidy to support their operations, it is desirable that a new general aviation airport in the Central Texas region be self-sufficient.

Overview of Airport Finances

Airport finances are the focus of much analysis by airport sponsors and airport management scholars. In many cases, analysis is conducted to identify common characteristics of financially successful airports, and determine the feasibility of improving the finances of a specific airport by fostering the characteristics of successful airports at that specific facility. In the fourth edition of *The Administration of Public Airports* the basics of airport finance are examined and factors impacting airport profitability are presented. Data from that text are summarized and augmented in the following section.

The relationship between airport operating revenues and airport operating expenses is one of the best measures of an airport's finances. Where operating revenues are greater than operating expenses, an airport can be considered profitable, and excess revenues are often used to support airport capital improvements. Where operating revenues are less than operating expenses, an airport experiences a net operating loss and requires some form of subsidy to meet operating requirements. In many cases, the operating loss of a general aviation airport is maintained at a reasonable level, and the public sponsor is willing to subsidize airport operations in exchange for the economic and social benefits that the airport provides.

The basic, underlying principle in the operation of any airport is to maximize airport revenues while minimizing airport expenses. Airport revenues are generated through airport-specific charges for the facilities and services that they provide. Airport operating revenues originate from the following primary sources:

- Airfield Charges – the most common of these charges is a landing fee. Landing fees are charged to aircraft operators upon their arrival at an airport and are typically based on the weight of the aircraft being flown. This methodology results in relatively higher landing fees for heavier aircraft, aircraft that tend to cause proportionately more runway wear and/or damage, while minimizing charges to smaller, lighter general aviation aircraft. Landing fees are typically charged to commercial airlines and cargo operators at scheduled service airports. Landing fees are typically not charged to general aviation operators because the cost of collecting those fees is typically greater than the financial benefit.

- Fuel Sales and Distribution Rights – some airports maintain the rights for fuel sales. In these cases, as the only provider of aircraft fuel, airports are able to generate revenues through the mark-up placed on the fuel sold at the airport. Airports typically establish methodologies for pricing fuel based on the wholesale cost of fuel and its delivery costs; cost of storing, transporting, and pumping the fuel; and an established percent profit for the airport. At airports where fuel sales are conducted by FBOs other than the airport sponsor, the airport sponsor typically generates revenues on fuel sales through a fuel flowage fee. The fuel flowage fee is an agreed upon per gallon fee, typically ranging from 5 cents to 10 cents per gallon, that is paid by airport FBOs on each gallon of fuel that is delivered to them for sale. At active airports, revenues from fuel sales and fuel distribution rights are some of the most important sources of airport revenue.

- Ramp and Hangar Fees – these fees are primarily comprised of aircraft parking fees and rental fees paid for airport-owned aircraft storage hangars. Aircraft parking fees and hangar storage fees are typically charged to both local and transient aircraft, at varying rates. Based aircraft being stored in tiedown positions on an airport's ramp area or in an airport-owned aircraft storage hangar are typically charged a monthly fee for the service. Transient aircraft parking at an airport overnight, either in an airport-owned hangar or on the ramp, are also typically charged a parking fee. These fees are charged at predetermined rates based on the size and weight of the parked aircraft and/or the size of the aircraft storage hangar being rented. Aircraft parking and hangar storage fees can be collected directly by the airport operator or through a concession to an airport FBO or FBOs. When operated as a concession, FBOs collecting these fees typically retain a certain percentage of the fee to cover their cost of collection.

- Airport Tenant Businesses/Concessions – airport revenues generated from on-airport tenant businesses and concessions are typically done so through lease provisions establishing payments to the airport that include a minimum rental payment, percentage of gross sales, or a combination of both. The minimum rental payment is typically based on a per-square foot rate established in a lease and charged based on the size of the tenant or concession's space at the airport. In some cases, in addition to a minimum rental payment, the airport sponsor also collects a portion of an airport business' or tenants' gross sales as airport operating revenues. This practice can generally be thought of as a payment by the business/tenant for the right to conduct business on the airport and serve customers who are typically airport users.

- Land Leases – land leases generate airport revenue through the long-term conveyance of airport property to a tenant, often for a period up to 30-years. An airport may enter into land leases with a variety of tenants including hangar owners and hangar developers, as well tenants utilizing airport property for industrial, commercial, or agricultural purposes. Land leases typically identify the area to be leased, a per-square foot per-year lease rate, and the resulting monthly payment to the airport. Land leases are the primary means for accommodating private hangar development at an airport. Long-term land leases allow an individual or business entity to lease airport property for a period of time long enough for them to amortize the cost of their investment (construction of hangar(s)) on that parcel of land. These agreements are beneficial to the airport in that they promote development, often at no cost to the airport, and can lead to increased activity levels.

In addition to these primary sources of airport revenues, other opportunities frequently exist for an airport to diversify and augment its revenue streams.

Offsetting airport operating revenues are airport operating expenses. Airport operating expenses are comprised of the day-to-day costs incurred by the airport sponsor in the operation of the facility and do not include other costs such as depreciation, debt service, and capital improvement costs that may also be incurred by the airport sponsor. Airport operating expenses are typically referred to as Operations and Maintenance (O&M) Costs. Typical components of airport O&M costs include:

- Maintenance of grounds, facilities, and equipment
- Salaries, wages, benefits, and overhead costs associated with airport employees
- Costs for outside professional services
- Tolls, equipment, office supplies, and other operating essentials
- Administrative costs for transportation, travel, and professional memberships
- Utilities
- Insurance
- Communications and computer expenses

The scope of airport operations and activities vary greatly between airports and significantly impact airport finances, their ability to generate revenues, and their operating costs. For instance, various types of airport activity, ranging from commercial passenger transport, air cargo activity, corporate general aviation, to recreational general aviation, all result in differing distributions of airport operating revenues and expenses, and therefore impact an airport's financial outcome. At airports served by commercial service airlines, as the proportion of air carrier movements goes up, so does the percentage share of revenues from passenger-related concessions such as auto rental agencies, restaurants, and auto parking. As passenger-related revenues increase, so does the airport's potential to fund its operating expenses, and reach financial self-sufficiency. At general aviation airports, those that generate operating revenues from non-aviation industrial land uses on airport properties, or other diverse revenue streams, are significantly more likely to operate profitably.

Airport Profitability Overview

Statistical analyses conducted by a number of sources indicate that airport revenues vary by airport size, activity levels, and location. Furthermore, airport accounting practices vary by facility, and therefore some variance is seen due to different accounting standards. In general, statistical findings regarding airport self-sufficiency indicate the following:

- Commercial service airports have the greatest potential to operate with a net operating profit. Within this airport category, airport profitability is correlated to passenger enplanements. Large-hub airports, those enplaning the most commercial service passengers, are much more likely to be profitable than small-hub or non-hub airports enplaning a relatively low number of passengers.

- Profitability at general aviation airports is impacted primarily by activity levels, activity types, and on-airport commercial/industrial development.

  - General aviation airports with relatively higher levels of aircraft operations are more likely to be profitable than airports with lower activity levels.

  - The type of activity that an airport accommodates is also an important consideration. In many cases general aviation airports supporting a high proportion of training operations tend to have high levels of activity but are rarely profitable because training operations generate minimal amounts of airport revenue. General aviation airports supporting a relatively high proportion of corporate and business activity, on the other hand, tend to be more profitable because of their ability to generate revenues from those classes of operators.

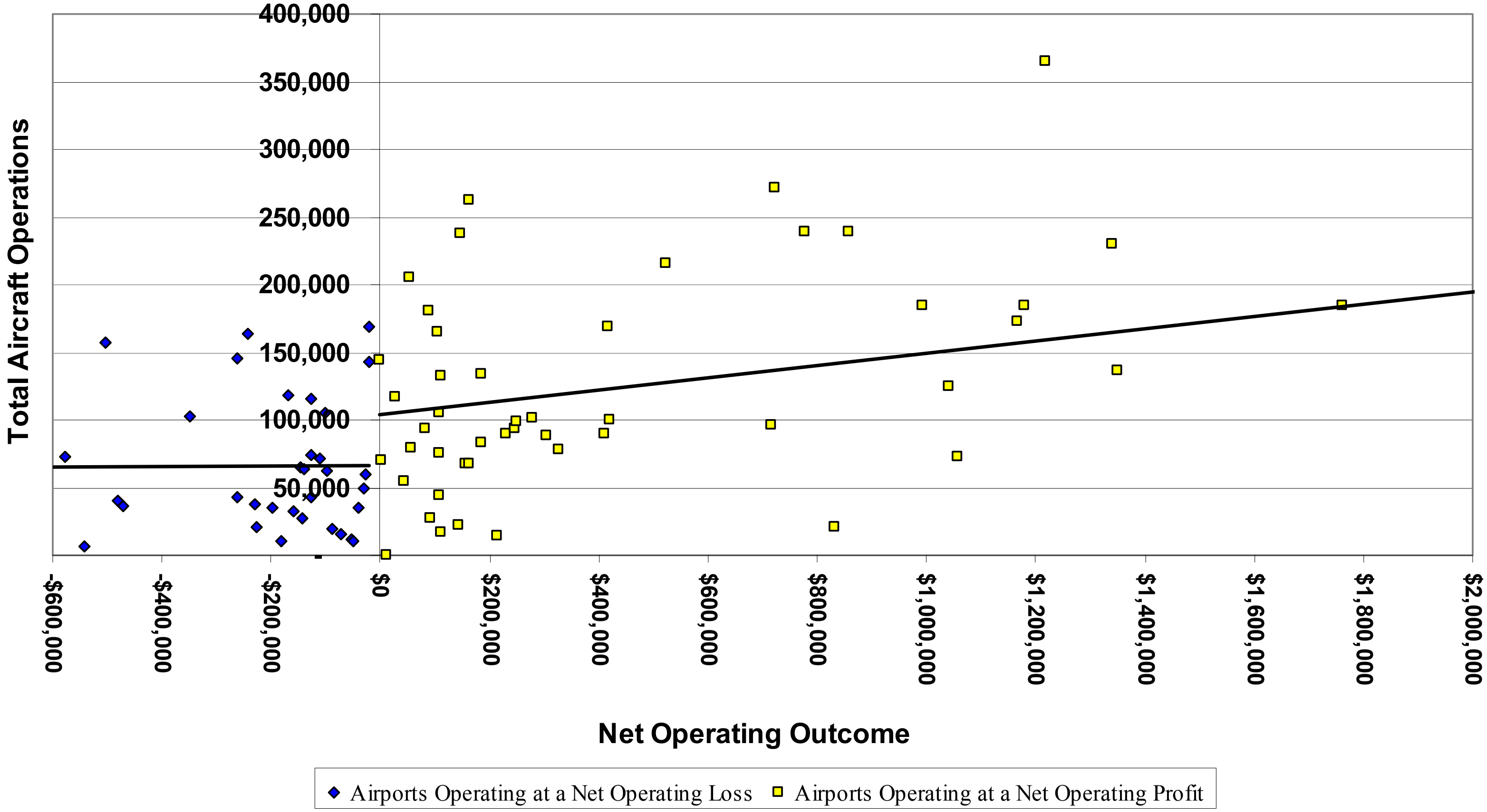
  - Regardless of activity levels and types, those general aviation airports generating revenues from both aviation-related businesses and non-aviation commercial/industrial uses of airport property are more likely to be profitable. Diversification of the airport's revenue stream through non-aviation commercial/industrial revenues in many cases acts as a subsidy for the airport as non-aviation revenues can be used to meet the financial operating requirements of the airfield.

For the purposes of this study, profitability at general aviation airports is the only relevant consideration. Any new airport in the Central Texas region would exclusively support general aviation activity since existing facilities at Austin-Bergstrom International Airport are anticipated to meet all commercial aviation activity needs in the study area well beyond the study period. The summary data presented in this section regarding general aviation airports will be expanded through the analysis of airport-specific financial data for general aviation airports throughout the nation.

National Analysis of Airport Profitability

On a biennial basis the American Association of Airport Executives (AAAE) conducts a national survey of airport rates and charges. In this survey, participating airports provide data regarding current rates and charges at their airport, as well as financial data regarding operating revenues, operating expenses, and subsidies. Recent survey results were analyzed focusing on profitability at general aviation airports. The findings of this analysis, common characteristics of profitable general aviation airports, and other findings are summarized and will be used to identify the potential of a new airport in Central Texas to operate profitably.

Relevant financial data was available for 83 general aviation airports from across the United States that participated in the AAAE's survey. It is important to note that financial data for participating commercial service airports is not included in this analysis. Of the 83 airports for which data was available, 35 experience an annual net operating loss from airport operations, while the remaining 48 are profitable. General aviation airports included in the survey range in size and nature from Sierra Blanca Regional Airport in Ruidoso, NM with approximately 7,500 annual aircraft operations to Oakland County International Airport, a general aviation airport in Pontiac, MI that also supports cargo activity and accommodated over 300,000 annual general aviation operations. Airport financial data from the AAAE survey is summarized in **Exhibit 9-1**.



Source: AAAE Rates and Charges Survey

Exhibit 9-1
General Aviation Airport Profit/Loss

The scatter-plot presented as Exhibit 9-1 depicts the net operating outcomes of the participating general aviation airports relative to their activity levels. Each data point presented on the plot represents that net operating outcome of a surveyed airport and the corresponding number of general aviation operations occurring at that airport. Black trend lines were added to the graph to summarize the overall characteristics of the statistical data. Separate trend lines are presented on the graph for profitable airports, those with a net operating outcome equal to or greater than zero, and airports experiencing a net operating loss.

While the individual data points representing airport survey data are dispersed through a relatively large range, depicting the variations seen based on local airport conditions, the trend lines depict the underlying characteristics of the data. For those airports with a net operating loss, activity levels reported in the survey are typically lower than 100,000 annual operations, and many airports in this category reported fewer than 50,000 annual aircraft operations. Some airports experiencing a loss, however, reported total operations counts of 100,000 or greater. The trend line was added to the graph to illustrate that although individual airport results may vary, a common characteristic on airports operating at a loss is relatively low levels of activity.

Profitable general aviation airports represented in the survey results reported a wide range of annual aircraft activity. Activity levels at these airports ranged from well under 50,000 annual operations to over 350,000 annual aircraft operations. Of the 48 airports in the survey that were profitable, only seven had fewer than 50,000 annual operations. There were a significant number of profitable airports that reported between 50,000 and 100,000 annual aircraft operations. The trend line developed by examining data points of profitable airports indicates that airports with at least 100,000 annual operations are more likely to operate at a profit, and as activity levels increase, profitability of general aviation airports would be anticipated to increase (e.g., more likely to be profitable and experience a greater profit).

As with any statistical analysis there are outliers in the data examined from the AAAE survey of rates and charges. Furthermore, airport-specific factors impacting operating revenues and expenses at the participating general aviation airports are largely unknown and local factors could have a very significant impact on some airport's net operating outcome. This analysis, however, used the best available data and focused on trends and common characteristics of the airports to generally examine those factors that tend to promote airport profitability and self-sufficiency. The implications of this, and previous, analyses on a new general aviation airport in Central Texas are examined in the following section.

Implications for the Central Texas Regional Airport

Financial self-sufficiency at an airport is impacted by a vast number of factors that reflect the facility's individual characteristics, complicated by the fact that no two airports are ever identical. Activity levels and makeup, on-airport tenant business activity, non-aviation use of airport property, and community involvement are all factors that have varying degrees of impact on an airport's "bottom-line." Although there is no single factor, or even group of factors, that will ensure financial self-sufficiency at an airport, analysis examined in this study has shown that certain airport characteristics promote improved financial operating conditions.

One common characteristic of profitable airports is high levels of aircraft operations. Analysis of national survey data illustrated that trends indicate that airports with between 50,000 and 100,000 annual operations have the potential to be self-sufficient. Once an airport reaches the 100,000 annual operations threshold, it is significantly more likely to be financially self-sufficient. As aircraft operations exceed 100,000 annual operations, the potential for profitability, as well as the amount of profit, tend to increase proportionately.

Recent activity statistics for airports in Central Texas indicate that over 500,000 general aviation aircraft operations occurred in the study area during 2002 and that almost 1,100 aircraft are based at Central Texas airports. The study area is home to an active and diverse aviation community. Regional projections of aviation demand were developed for the study area and presented in Chapter Five, *Regional Projections of Demand*. Those regional projections are summarized as follows:

- By the end of the projection period, an **additional 273,000 aircraft operations** are projected to occur at study airports **on an annual basis**
- An **additional 580 based aircraft** are anticipated to locate at study area airports over the projection period, **including** an additional **50 corporate jet aircraft**.

As this analysis indicates, aviation activity in the study area is anticipated to increase significantly over the projection period, growing in tandem with the area's anticipated demographic and economic growth.

While the projections of regional demand quantified anticipated growth in aviation activity for the entire Central Texas area, further analysis summarized in Chapter Six, *Implications of Regional Demand*, identified that aviation demand in the study is centered on specific demand nodes. Demand nodes represent those areas in Central Texas where people, pilots, and businesses are more densely populated, and as a direct result, the demand for aviation services in these areas is relatively higher than in less populated areas. Two primary nodes of demand identified in this study include the following:

- Central and Southern Travis Counties (Austin and South Austin)
- Williamson County and Northern Travis County (North Austin and Round Rock)

It is important to note that portions of Hays and Caldwell counties located near the City of San Marcos were also identified as a demand node in this study. Existing and projected demand for general aviation services in this demand node, however, are anticipated to be adequately served by San Marcos Municipal Airport through the study period.

The Austin and north Austin/Round Rock primary demand nodes currently generate the majority of aviation demand in the study area, and airports located proximate to these nodes accommodate over 50 percent of the study area's total aviation activity. It is reasonable to assume that a similar proportion of the study area's future activity would be generated in by these nodes. Based on regional projections of demand, as well as the percentage of activity generated and accommodated in the primary demand nodes, it is estimated that by the end of the projection period and additional 200,000 annual aircraft operations will occur in the primary demand nodes and an additional 400 aircraft will be based there. Given this significant increase in activity, the location of the demand nodes, and existing and anticipated capacity constraints at study area airports, it is likely that a new general aviation airport constructed in Central Texas could attract and accommodate in excess of 100,000 annual aircraft operations and hundreds of based aircraft, including corporate jets.

While activity levels may be one of the most significant determinants of an airport's operating outcome, activity levels themselves do not ensure profitability. The types of aircraft activity being supported and the amount of ancillary airport business activity generated by aviation operations are also very important considerations. Other common characteristics of profitable airports are listed below:

- Location proximate to a major population center
- Active corporate users
- Core general aviation users
- Aviation-related business tenants
- Non-aviation related commercial and industrial tenants

The study area provides opportunities for a new general aviation airport to reflect all the characteristics listed above as well as quickly reach activity thresholds that tend to promote financial self-sufficiency. While these activity thresholds may not be met on opening day of the new facility, and it may take time to develop some of the common characteristics of profitable airports on the new site, the long-term potential of a new general aviation airport in the Central Texas region to operate in a financially self-sufficient manner should be considered exceptional for a number of reasons, including those identified in the following summary.

Summary

As the analysis summarized in this chapter has indicated, airport activity levels are a primary driver of airport financial operating outcomes. In general, airports accommodating higher levels of aircraft operations and based aircraft have a higher propensity to operate in a financially self-sufficient manner. Other factors, such as the type of activity occurring at the airport, can also significantly impact airport finances. This analysis has examined activity levels and other common characteristics at financially self-sufficient airports, and the findings, as well as their likely implications on a new general aviation airport in Central Texas can be summarized as follows:

- An additional 280,000 annual aircraft operations and 550 based aircraft, including 50 jets, are projected for the study area by 2022. Most of this additional demand for aviation services will be generated in the two primary demand nodes identified in the study area. A new general aviation airport located proximate to one or more of these demand nodes would likely attract a significant amount of the area's projected activity growth, and to a lesser degree, activity currently supported by existing study area airports.

- There are almost 1.3 million residents in the Central Texas study area. The population of the study area grew by almost 50 percent between 1990 and 2000. Projections developed by the Texas State Data Center estimate that the study area's population will increase by another 50 percent between 2000 and 2020, an increase of over 650,000 persons over the 20-year period. The most significant population growth is projected for Travis and Williamson counties, areas identified as primary nodes of demand in this study area. The Austin area and its surrounding counties represent a major population center and an area projected to experience rapid population growth over the next 20 years. Travis and Williamson counties are currently the most densely populated areas of Central Texas, a new general aviation airport located proximate to one or both of these counties would likely attract a significant proportion of the aviation demand generated in these counties.

- National Business Aviation Association, Inc. (NBAA), an association of over 7,100 member companies that use and/or support corporate aviation, has almost 50 members located in the study area. Many other businesses located in Central Texas own or frequently use corporate general aviation aircraft to support their operations. Jet aircraft are also the fastest growing component of the nation's general aviation fleet, and strong growth is anticipated in jet aircraft through the end of the study period. Given the number of businesses in the region that utilize general aviation aircraft, including corporate jets, and the projected growth of this component of the general aviation fleet, it is highly likely that a new general aviation airport, with the proper location and having adequate facilities, would attract frequent jet aircraft operations and a number of based jet aircraft.

- Utilization rates of jet aircraft tend to be significantly higher than in other aircraft types indicating that those corporations owning jet aircraft fly them more frequently than, for example, an individual that owns a small single engine piston aircraft. In addition, jet aircraft burn fuel at a more rapid rate and have larger fuel storage capacities, meaning that airports supporting operations by jet aircraft tend to have higher activity levels and tend to sell more fuel, and therefore generate more revenues, than those airports that primarily support small piston aircraft. A Gulfstream IV jet aircraft has fuel storage capacity of over 4,400 gallons and Cessna Skyhawk single engine piston aircraft has a fuel storage capacity of approximately 56 gallons. This data indicates that almost 80 Cessna Skyhawks would have to be completely refueled in order to generate the same amount of fuel sales as a complete refueling of a Gulfstream IV. The volume of fuel sales generated by jet aircraft, the type of aircraft that a new general aviation airport in Central Texas would be built to accommodate, would generate a significant amount of airport revenue and positively impact the potential self-sufficiency of that airport.

- A survey of registered aircraft owners in the study area identified that a significant percentage would be interested in locating to a new general aviation airport. Of the 416 owners responding to the survey, approximately 340, or 82 percent, indicated that they would consider relocating their aircraft to a new general aviation airport. These survey respondents indicated that the location of the new facility would be the biggest factor in their decision to relocate. As previously shown in Exhibit 6-2, GIS mapping of the address of residence of the aircraft owners included in the survey, the density of registered aircraft owners is greatest in portions of Travis and Williamson counties. Locating a new general aviation airport proximate to one or more of these demand nodes would have the propensity to attract some of the area's registered aircraft owners to base their aircraft at the facility. While the new general aviation airport would primarily be intended to serve new aviation demand that is anticipated to be generated in the study area due to growing demographic and economic trends, the new facility may also be able to better serve some of the existing aircraft owners in the study area by reducing the distance and drive-times traveled to reach the airport at which their aircraft is based.

- The co-location of an industrial park and a new general aviation airport in Central Texas will be a consideration examined in the Site Selection phase of this study. The development of an industrial park on airport property by a local economic development corporation or other public/private entity, where feasible, would promote regional economic development, increased airport activity, and improved financial operating conditions at the airport.

As this summary indicates, a new general aviation airport in the Central Texas area, constructed at a location proximate to the primary nodes of demand identified in the region, has a high potential to attract a significant amount of general aviation activity. Furthermore, the new facility would also have a high potential to reflect some of the other common characteristics of profitable airports identified in this chapter. As result of these factors, a new general aviation airport in Central Texas, given the proper location and types of facilities, would be anticipated to have a high probability of functioning in a financially self-sufficient manner during the planning period.