

Survey of Business Aircraft Users In Texas



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by

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CHAPTER 1. INTRODUCTION

BACKGROUND

Airport planning and programming continues to be a challenging process. Currently, the combined annual federal and state sources for general aviation airports in Texas is approximately \$38 million while total needs approach \$120 million. With the limited resources available, it is clear that every effort must be taken to ensure that planners make the most prudent and efficient use of these resources.

For many communities, the airport is a vital link that improves their access to jobs and commerce either directly from the jobs and revenue generated at the airport or indirectly through the access it provides for business and industry. In Texas, this ranges from the many facets of the agricultural industry to oil and natural resources that are located in the rural areas of the state to the high technology and service corporations that have flocked to the urban areas. Regardless of the industries they serve, airports big and small continue to be the economic engines of their region. The location of an airport and the level of service it provides is often high on the list of industry leaders when considering the location of new facilities. The airport is indeed a critical link in the transportation system.

With limited resources and the on-going need to generate and stimulate economic growth, communities of all sizes are continuously faced with the difficult task of how to best spend the little money they have. The decisions made toward these efforts have often involved a myriad of incentives and tax rebate programs that taxpayers are more frequently finding excessive and inappropriate. But capital investment in the transportation infrastructure can be of great benefit to communities and their economic growth but only if these investments are directed at meeting the needs of the users. This study will assist planners in better understanding the needs of business aircraft users and help planners create a blueprint for the airport system.

Identifying which airports to upgrade from utility to transport runway design standards is a continuous system planning challenge. Many communities believe they need at least a 5,000-foot runway to compete successfully for economic development. Increasingly, corporations are using turbine-powered aircraft to transport personnel, equipment, and materials. From the perspective of the corporate decision-maker, the community airport is simply one of many criteria used in making a location decision. Rarely does a corporate manager seeking a new location petition the state airport funding agency for a longer runway at a specific airport. The corporation inevitably goes elsewhere where its needs can be adequately met. The perspectives of the community leader and the corporate manager can be quite different.

The purpose of this study is to survey business aircraft users to determine their needs with respect to four specific areas—1) system plan locations; 2) airport facilities; 3) airport geometrics and instrument and visual approach facilities; and 4) access to system airports.

AIRPORT DEVELOPMENT IN TEXAS

The airport development process for the Texas Airport System is detailed in the Aviation Division's *Policies and Standards Document* (1). The document, required by Texas law, establishes the policies used by the Aviation Division to:

- prepare and adopt an aviation facilities development program identifying the aviation facility requirements, locations, timing, eligibility for funding, and the investment necessary for a statewide system of airports that, for the least practical cost, will provide for the state's air transportation needs: and
- establish and maintain a method for determining priorities among locations and projects eligible to receive state financial assistance for aviation facility development (1).

The airport planning process is a continuous process with the development needs of a third of the system's airports being updated every year. This continuous process, as outlined in the Policies document, accomplishes the following:

- Identifies the cost and the level of federal, state, and local capital investment required to maintain and develop system airports;
- Satisfies the requirements of the Texas Transportation Code, Chapter 21;
- Provides guidance for the expenditure of funds under the Federal Aviation Administration (FAA) Airport Improvement Program;
- Provides guidance for expenditure of funds under the Texas Department of Transportation (TxDOT) Aviation Division Facilities Development Program; and
- Supports development of state aviation policy (1).

The Texas Airport System Plan (TASP) identifies an airport system that will meet identified goals and objectives. There are four goals and six objectives set out for the airport system in the Policies document. The four goals are:

1. Providing a safe, efficient, cost-effective, well-maintained, and environmentally sound air transportation system;
2. Providing adequate access by air to the population and economic activity centers of the state;
3. Maximizing the opportunities for economic growth, international trade, and tourism in Texas; and

4. Effectively integrating the airport system with other transportation modes.

The six objectives are:

1. Providing airports capable of supporting scheduled commercial service within a 60-minute drive of major population centers;
2. Providing airports capable of supporting business jet aircraft within a 30-minute drive of population and mineral resource centers and the economic activity generated by urban development;
3. Providing airports capable of supporting single- and twin-engine piston-powered aircraft within a 30-minute drive of agricultural resource centers;
4. Providing adequate capacity to meet forecast aviation demand;
5. Providing an airport system developed to appropriate federal and state planning and design standards; and
6. Encouraging community support of, and involvement in, the development and maintenance of local airports (1).

The airport planning process is also a function of the airport's service level and role. The service levels are related to an airport's contribution to the identified goals and objectives while the role an airport plays in the state system is related to design standards. The service level of an airport reflects the service provided to the community by the airport. The four service levels are general aviation, reliever, non-primary commercial service, and primary commercial service (1). The airport roles are basic utility, general utility, or transport (1). The most stringent or restrictive design standards are those for commercial service airports which are also by definition transport airports.

The project type further categorizes the airport development identified in the TASP. These airport development categories are also referred to as objective codes and are used in a hierarchical fashion to prioritize airport projects. The seven airport development categories are (1):

1. Safety/special programs;
2. Preservation/reconstruction;
3. Standards;
4. Upgrade;
5. Capacity;
6. New capacity airport; and
7. New community airport.

Federal airport funding is accommodated through the Airport Improvement Program (AIP) and is divided into primary commercial service, cargo, and state apportionment categories. Non-primary commercial service, relievers, and general aviation airports are funded through the state apportionment category. Further, there exists a National Priority System (NPS) which is used to prioritize airport projects according to the size and role of the airport and is outlined in FAA Program Guidance Letter 98-2 (1) (2). The four NPS categories used are:

1. Code A - Primary commercial service airports in large and medium hubs, or non-primary commercial service, reliever, or general aviation airports with 100 or more based aircraft or 50,000 or more annual itinerant operations.
2. Code B - Primary commercial service airports outside large and medium hubs, or non-primary commercial service, reliever, or general aviation airports with 50 or more based aircraft or 20,000 or more annual itinerant operations.
3. Code C - Non-primary commercial service, reliever, or general aviation airports with 20 or more based aircraft or 8,000 or more annual itinerant operations.
4. Code D - Non-primary commercial service, reliever, or general aviation airports with less than 20 based aircraft or less than 8,000 annual itinerant operations (1).

All of the AIP-eligible projects are given a work code that consists of the purpose, the component, and the type of project. The purpose codes are similar to the TASP objective codes with some exceptions. The eight purpose codes are:

1. Safety/security;
2. Statutory emphasis Programs;
3. Reconstruction;
4. Environment;
5. Planning;
6. Capacity;
7. Standards; and
8. Other

The state also has a priority guidance system. The numerical component is similar to the federal system but it also includes a sponsor component and an economic component that considers the level of interest from the sponsor and the economic importance of the airport to the community, respectively.

Airport Functional Categories

As briefly mentioned above, airports, depending on their service level and role, have an assigned corresponding set of design standards intended to allow for the safe and efficient operation of aircraft at that particular facility. However, there has been some debate as to whether or not some

airports need to be built to assigned design standards when safety and operational considerations allow otherwise. Recently, TxDOT's Aviation Division developed the following nine functional categories for airports in the system (1):

1. Commercial;
2. Reliever;
3. Regional;
4. Multipurpose;
5. Industrial;
6. Special Use;
7. Agricultural;
8. Remote; and
9. Access.

To address what design standards are appropriate and necessary, the airport should be viewed with its main function in mind. An airport receives a functional category designation when 60% of its total operations are of a particular primary use. Based on these functional categories, an airport may or may not need all of the design standard elements outlined according to its role and service level.

A recent TTI study addressed these issues and developed recommendations on what design element changes could be considered when accounting for the function of the airport (3). These recommended design element changes include deletions as well as additions to existing standards. For example, in the case of agricultural airports, loading pads and access roads have been added to the design standards associated with airports serving the agricultural community (3) (4). In addition, recommendations were made to relaxing the requirement of a terminal building. While it is not specifically eliminated, some judgement should be used, as there may be other significant users of the facility that would benefit from a terminal. This was done purely on the basis of the primary function of the airport.

Currently no special functional category exists for business class airports or those that serve or desire to serve business aircraft users. Despite their importance to communities and their role in economic growth and development, their use is incorporated within the other categories. Table 1 shows the number of TASP airports by functional category.

TABLE 1
TASP Functional Categories

Functional Category	Number of Airports
Commercial	27
Reliever	23
Regional	42
Multipurpose	140
Industrial	5
Special Use	9
Agricultural	19
Remote	7
Access	26
Total Number of Airports in TASP	298

Source: TxDOT, Aviation Division.

Design Standards

As indicated above, airports are classified and categorized differently. When describing an airport, they can be referred to by the role they play in the system, the level of service they provide, or by their functional category. All of these, along with the critical aircraft serving the airport, are considered in determining the appropriate design standards. In brief, an airport's role is basic utility, general utility, or transport. The service levels are general aviation, reliever, non-primary commercial service, or primary commercial service. The design standard is closely associated with the airport's role, which is discussed in more detail below.

Basic utility airports are the smallest of general aviation airports and typically have visual or non-precision instrument approach operations. They are further categorized as either Stage I or Stage II. Basic Utility Stage I airports are generally capable of handling 75% of single-engine and small twin-engine aircraft activity and involve aircraft that typically weigh approximately 3,000 pounds or less (5). Basic Utility Stage II airports accommodate the same aircraft as the Stage I airports as well as some small business aircraft.

General Utility airports provide access to small communities as well as increase the capacity in the larger urban areas. In Texas, they provide access to many rural and remote industries in the state including agricultural and mineral production centers. General Utility airports are also categorized as either Stage I or Stage II. General Utility Stage I airports typically have non-precision instrument approaches while the Stage II airports have precision approaches and serve larger aircraft including business class aircraft up to small corporate jets. Transport airports are designed to accommodate turboprop and turbojet aircraft in areas where there is sufficient support for high levels of business jet activity.

To better understand the type of aircraft served by these different airports, some discussion of airport reference code (ARC) is warranted. The ARC is a coding system used to relate the physical characteristics of the aircraft intended to operate from a particular airport to the design criteria for that airport (1). The code consists of two components. The first is the aircraft approach category that describes the approach speed of the aircraft intended to use the airport the most. The second is the airplane design group that describes the wingspan of that same aircraft. The approach speed is related to the operational characteristics of the aircraft while the wingspan is related to the physical characteristics of the aircraft. Together, this code or index provides the basis for the airport design category. The intended aircraft is often referred to as the critical aircraft and refers to the aircraft with the most stringent requirements for facilities that will use, or is expected to use, the airport on a regular basis. This does not preclude larger aircraft from utilizing the facility but does prevent the overbuilding of a facility to accommodate aircraft that rarely or only occasionally use the airport. Thus, a more efficient use of resources is realized. Table 2 lists the different aircraft approach categories and Table 3 lists the different airplane design groups.

TABLE 2
Aircraft Approach Categories

Category	Approach Speed
A	Less than 91 knots
B	91 knots or more but less than 121 knots
C	121 knots or more but less than 141
D	141 knots or more but less than 166
E	More than 166 knots

Source: FAA (6).

TABLE 3
Aircraft Design Groups

Group	Wingspan
I	Up to but not including 49 feet
II	49 feet up to but not including 79 feet
III	79 feet up to but not including 118 feet
IV	118 feet up to but not including 171 feet
V	171 feet up to but not including 214 feet
VI	214 feet up to but not including 262 feet

Source: FAA (6).

For example, an aircraft with an approach speed of 100 knots and a wingspan of 70 feet has an ARC of B-II. Basic and general utility airports are typically designed to serve category A and B aircraft while transport airports are designed to serve category C, D, and E aircraft. The design standards for transport aircraft are determined more by the airplane design group than the approach category (5). Appendix A provides a listing of aircraft types by airport reference code. Appendix B lists current airports in the TASP by functional category, and Appendix C provides the current applicable design standards for airports in the system according to their role and service level. A recent TTI study developed recommendations regarding changes to these design standards based on an airport's functional category (3). These are provided in Appendix D.

It is clear that airports whose functional categories are commercial, reliever, regional, or industrial will not have a problem meeting the needs of business aircraft users as they typically serve larger and more demanding aircraft, providing they meet their related and intended design standards. Other airports, particularly those in the multipurpose functional category do not necessarily meet that challenge. These multipurpose airports consist of almost half of the airports in the state system including many that play an important role in regional economies both urban and rural. This includes providing access for industries or businesses that are locally economically significant in the rural areas or improving capacity and access in the larger urban areas where commercial, reliever, and regional airports may not adequately accommodate a particular business. Many multipurpose airports are expected to serve business aircraft users or, at least their public owners hope these airports would attract and accommodate this type of aircraft.

It should be noted that this is not necessarily the case with special use, agricultural, remote, or accesses airports. However, it would not be unusual in Texas to have a need for an airport that is capable of accommodating business aircraft located in rural or remote parts of the state. The state is both economically and geographically quite diverse. The needs of the agricultural, petroleum, and recreational industries, among others, in the state could easily dictate such a facility. This research will help identify what design standards and level of investment are applicable and necessary when planners seek to accommodate current business interests and needs and when they are attempting to attract additional businesses for economic growth and development purposes.

CHAPTER 2. LITERATURE REVIEW

Market forecasts and economic projections that paint quite a rosy picture for the future have more recently dominated the literature surrounding business aviation. This includes the changes in product liability laws, fractional ownership programs, and other emerging trends and events that have contributed to the recent growth and success of general aviation and specifically business or corporate aviation. Little, however, has been written regarding the needs of business aircraft users and the facilities generally regarded as being capable of accommodating, attracting, and servicing business aircraft.

This focus on a bright future is largely due to the general malaise that shrouded the general aviation industry until recently when reforms, in combination with generally positive economic conditions, seemingly took hold. Since then, general aviation activity has flourished with business aviation witnessing impressive growth that is expected to continue well into the future. With this growth comes the need for accommodating the demand. This demand, while prevalent across the U.S., is beginning to surface across the world. New aircraft design and technology has made Trans-Atlantic and Trans-Pacific flights a reality for some corporate aircraft. This has spawned an interest in both Asia and Europe where fractional ownership programs and fixed-base operators offering special business aircraft services and accommodations are beginning to emerge. This research focuses on identifying the current makeup of the business aircraft fleet in Texas, its emerging trends, and the needs of these users with respect to airport infrastructure and services. This chapter will put this research into perspective in terms of where the industry has traveled in the last 20 years.

Corporate aircraft have long been a necessity for many companies across the state and country. The flexibility and access that comes with using corporate aircraft is largely unmatched by any other mode of transportation. The ability to move senior and executive personnel in a timely and efficient manner as well as the ability to reach rural or hard-to-get places have long been the crux of the argument justifying their use. Convenience is a significant factor too as time out of the office is minimized, as are expenses associated with overnight travel. Though once viewed by many as a corporate extravagance or luxury used by a select few, business aviation is now comprised of many businesses of varying size that fly personnel of varying management levels. This can include mid-level employees as well as clients who are expected to use the flight time to work.

HISTORICAL PERSPECTIVE

Understanding this segment of general aviation and putting it into the proper perspective is best accomplished through the use of different measures. Business aircraft activity can be examined through the use of several measures “including shipments of new general aviation turboprop and jet aircraft, by domestic and foreign manufacturers, the size of the U.S. active turbine fleet, and the use of this fleet in terms of total flight hours (7).”

The following tables trace the past quarter century of activity in the business aircraft segment of the general aviation industry. Table 4 lists the number and type of airplane shipments of U.S. manufactures airplanes going back to 1975. Shipments rose steadily and peaked in 1981 when it began to fall off sharply. After some tough years in the 1980s, the market began to steadily rise

following the General Aviation Revitalization Act and the strong economic conditions in the 1990s.

TABLE 4
Annual New U.S. Manufactured General Aviation
Aircraft Shipments by Aircraft Type

Year	Turboprop	Jet	Total Turbine
1975	305	194	499
1976	359	187	546
1977	428	227	655
1978	548	231	779
1979	639	282	921
1980	778	326	1,104
1981	918	389	1,307
1982	458	259	717
1983	321	142	463
1984	271	169	440
1985	321	145	466
1986	250	122	372
1987	263	122	385
1988	291	157	448
1989	268	157	425
1990	281	168	449
1991	222	186	408
1992	177	171	348
1993	211	198	409
1994	207	222	429
1995	255	246	501
1996	289	241	530
1997	236	348	584
1998	271	415	686

Source: General Aviation Manufacturers Association

Table 5 presents similar breakdowns but does so in terms of the dollar value of these shipments. The trends are quite similar to the shipment numbers as would be expected. However, the dollar value has increased more dramatically in recent years as jet shipments have surpassed that of turboprops.

TABLE 5
Estimated Value of New U.S. Manufactured General Aviation
Aircraft Shipments by Aircraft Type (In Millions)

Year	Turboprop	Jet	Total Turbine
1975	\$180	\$281	\$461
1976	\$238	\$293	\$531
1977	\$296	\$329	\$625
1978	\$394	\$378	\$772
1979	\$548	\$540	\$1,088
1980	\$875	\$816	\$1,691
1981	\$1,120	\$1,125	\$2,245
1982	\$590	\$990	\$1,580
1983	\$460	\$750	\$1,210
1984	\$436	\$966	\$1,402
1985	\$524	\$713	\$1,237
1986	\$430	\$709	\$1,139
1987	\$477	\$789	\$1,266
1988	\$596	\$1,242	\$1,838
1989	\$524	\$1,149	\$1,673
1990	\$644	\$1,272	\$1,916
1991	\$527	\$1,348	\$1,875
1992	\$460	\$1,284	\$1,744
1993	\$595	\$1,473	\$2,068
1994	\$595	\$1,681	\$2,276
1995	\$653	\$2,066	\$2,719
1996	\$734	\$2,247	\$2,981
1997	\$740	\$3,720	\$4,460
1998	\$778	\$4,759	\$5,537

Source: General Aviation Manufacturers Association

Table 6 presents the number of estimated hours flown by general aviation and air taxi aircraft. As with the other measures, the number of hours flown has increased in recent years for both turboprops and jet aircraft. The 1980s and early 1990s were characterized by decreases in the number of hours flown. But again, a strong economic environment and beneficial legislation sparked a comeback in the industry that continues today and is expected to continue into the near future.

TABLE 6
Estimated Hours Flown in General Aviation and Air Taxi
by Aircraft Type (In Thousands)

Calendar Year	Turboprop	Turbojet
1977	1,549	1,165
1978	1,606	1,194
1979	1,871	1,259
1980	2,240	1,332
1981	2,155	1,387
1982	2,168	1,611
1983	2,173	1,473
1984	2,506	1,566
1985	1,921	1,498
1986	2,661	1,527
1987	2,010	1,411
1988	2,195	1,554
1989	2,892	1,527
1990	2,319	1,396
1991	1,628	1,071
1992	1,582	1,076
1993	1,192	1,121
1994	1,142	1,238
1995	1,490	1,455
1996	1,768	1,543
1997	1,655	1,713

Source: Federal Aviation Administration

Table 7 also presents aircraft hours flown data but on a per aircraft basis for a five-year period. The utilization rates of both turboprop and jet aircraft have increased as owners and operators are flying more and getting more from their aircraft. One factor in these increasing rates may be the growing popularity of fractional ownership where businesses can buy the access to aircraft they need without incurring the additional expenses with owning the aircraft outright. With multiple fractional owners, the aircraft tends to be flown more often than with a single owner.

TABLE 7
Active U.S. General Aviation and Air Taxi Aircraft
and Average Hours Annually Flown Per Aircraft, by Type

Year	Turboprop	Turbojet
1993	4,359	3,859
1994	4,206	4,072
1995	4,530	4,577
1996	5,309	4,287
1997	5,619	5,178

Source: Federal Aviation Administration

Table 8 lists the number of aircraft in the active general aviation and air taxi fleet in the U.S. The table further classifies the aircraft into turboprop or turbojet. This table communicates the same notion as the previous activity measures. It shows the same pattern of activity through the years while forecasting continued growth through the year 2010. The manufacturers expect this growth trend to continue for turboprop and turbojet aircraft

TABLE 8
Active U.S. General Aviation
and Air Taxi Fleet (In Thousands)

Historical		
Calendar Year	Turboprop	Turbojet
1992	4.8	4.0
1993	4.1	3.7
1994	4.1	3.9
1995	5.0	4.6
1996	5.7	4.4
1997	5.6	5.2
1998	5.7	5.5
Forecast		
1999	5.8	5.8
2000	5.9	6.1
2001	5.9	6.4
2002	6.0	6.6
2003	6.1	6.9
2004	6.2	7.2
2005	6.2	7.4
2006	6.3	7.7
2007	6.4	7.9
2008	6.5	8.2
2009	6.5	8.5
2010	6.6	8.7

Source: General Aviation Manufacturers Association

Table 9 presents the average age of the U.S. general aviation fleet for multi-engine aircraft in 1998. Though not an activity measure itself, the average age of the fleet can provide additional insight into where the industry may be headed. Aging fleets typically have to be replaced and updated. According to the General Aviation Manufacturers Association the average age of general aviation turboprop aircraft is 19 years while the average age of the general aviation jet fleet is a little younger at 16 years.

As the data presented on the previous tables articulates, the road leading to the current state of the general aviation, and more specifically the business aviation industry, has been a tumultuous one. “The 1980s were a time of adjustment for business aviation. The costs and prices rose. Markets for turbine-powered aircraft became thinner as a result of slower economic growth, recessionary powers on corporate earnings and profits, and increased merger and takeover activity (8).” Some legislative relief by way of the Revitalization Act and a more robust economy has led to a turn-around in the industry. Other factors, including fractional ownership, new technology, and globalization have further contributed to the success of business aviation. By 1995, fractional ownership had emerged as a trend and the strengthening economy was seen as a potential catalyst for jump-starting the industry (9).

TABLE 9
Average Age of the U.S. General Aviation Fleet - Multi-Engine - 1998

Engine Type	Seats	Average Age in Years
Piston	1-3	30
Piston	4	27
Piston	5-7	30
Piston	8+	31
Turboprop	All	19
Jet	All	16

Source: General Aviation Manufacturers Association

CURRENT PERSPECTIVE

Today, the business aircraft is no longer viewed as a luxury or perk for the senior management of large multi-national corporations. It is no longer a status symbol for the privileged few (10). Rather, it is often viewed as a necessity for businesses of all sizes. Time, convenience, and the need to access rural or remote locations are all reasons that aircraft have become an important tool in conducting business today. In fact, the use of business aircraft is not a substitute for commercial airlines but often complements the commercial airlines. Members of the National Business Aircraft Association (NBAA), the largest business aviation industry group in the country, spend \$11 billion dollars a year in airline tickets (11). While business aircraft have access to more airports and communities, sometimes business considerations warrant that commercial airlines be used. Some of the benefits of corporate aircraft include saving employees time, increasing productivity as they can work better on the plane, controlling schedules, attracting and retaining clients, and minimizing overnight travel.

While the industry has enjoyed success in this country, the use of business aircraft overseas has increased as well. Fractional ownership has brought the larger trans-oceanic aircraft within reach of more companies and countries in both Europe and Asia have seen new businesses that serve these business aircraft. "The idea of executives using their own jets to save time, to make point-to-point business connections and to assure security is in its infancy in Asia (12)." Hong Kong recently saw the arrival of its Business Aviation Center at Chek Lap Kok Airport. "The center has been host to a number of visiting U.S. government aircraft. Its biggest business base has been long-range executive jets coming in from the U.S., such as G-Vs, Challengers, and FalconJet 900s (12)." Japan leads Asia as the home of business jets and China is in the very early stages with forecasts of strong growth. Fractional ownership operator NetJets recently expanded into Europe and announced plans for operations in Latin America and Asia. They currently have one aircraft operating in the Middle East in Saudi Arabia (13).

Globalization has also helped fuel the business aircraft market. Not only does this contribute to the growth in the U.S., but also to other parts of the world. While still in its infancy in Asia and Latin America, business aircraft use has caught on in Europe. "Growing demand for flexible travel is fueling growth of fractional ownership in Europe as private and public companies seek to expand business opportunities throughout the region (14)." These trends are expected to continue as "a key factor driving interest in fractional ownership in Europe is the emergence of Pan-European companies engaging in cross-border mergers and investment (14)."

The recent successes of the business aircraft industry have been remarkable. "From a global perspective, the business jet industry has experienced unprecedented growth, tripling in value between 1995-2000 (15)." This is expected to continue in the future as well. "The Teal Group is forecasting more than 6,400 jets worth \$78.3 billion will be sold in the next 10 years as advanced aircraft and the need for flexible travel continue to fuel demand (15)." Interests in fractional operators have been soaring and the last six years has seen the introduction of no less than 15 new business jets (15). This can provide a challenge for airport system planners trying to provide the infrastructure to accommodate these aircraft. Doing so is important to communities of all sizes. It is important to the continued success of the business jet industry as well as the economic viability of communities.

Access issues are the predominant concern of the industry as the flexibility often referred to as a benefit of business aircraft use applies to locations as well as saving time. Access can pertain to the ability to use busy commercial airports in large cities or the ability to utilize smaller more convenient airports. The first deals with landing slots and congestion issues while the second concerns suitable and available infrastructure. But access constraints can be equally hard on the communities whose facilities are less than adequate to handle business aircraft. "In the longer term, not only is executive general aviation damaged by such constraints, but cities and communities that prohibit or constrain access by executive general aviation may do harm to their local and regional economies, as corporations factor such prohibitions into corporate location and expansion decisions. The chance that a city or community will attract or retain a corporate headquarters or major production facility is reduced if firms are denied use of executive general aviation (9)."

Strong economic conditions and corporate profits, along with the onset of fractional ownership programs, new aircraft technology replacing retiring business aircraft, and the advent

of globalization in the marketplace have all contributed to the growth and success of the business aircraft industry. All indications seem to point to continued growth in the future.

CHAPTER 3. SURVEY METHODOLOGY

In 1991, TTI conducted a survey of business aircraft users in Texas for TxDOT's Aviation Division. The survey results were useful to TxDOT as they identified the users, what airports they used, and what their needs were with respect to infrastructure. But as the last chapter highlighted, a lot has changed in general aviation, and specifically business aviation, since 1991. Businesses are using more and different aircraft, they are flying to more locations, and the equipment, both on the ground and in the airplane, is becoming more sophisticated. These wide-scale industry changes have prompted the Aviation Division to revisit and reassess the needs of business aircraft users with respect to the state's airport system.

SURVEY DESIGN

As a starting point, the 1991 survey instrument was used. It was revised and updated to account for changes in the industry and technology advancements that occurred in the past nine years. In addition, changes were made to more clearly communicate certain questions to ensure adequate and meaningful responses. Since wording of questions can greatly influence responses, the research team did not want the phraseology of the question to improperly influence the responses.

TTI researchers with extensive experience in survey methods and design then reviewed the survey. Aviation Division staff also reviewed the survey. This review process ensured that the construction and content of the survey would be suitable to meet the stated objectives of the survey itself. As a matter of review, the purpose of this study is to survey business aircraft users in order to determine their needs with respect to four specific areas. The specific areas are: 1) system plan locations, 2) airport facilities, 3) airport geometrics and instrument and visual approach facilities, and 4) access to system airports.

Following completion of the survey construction and review, it was tested to see how well it worked in practice. The research team selected 10 companies from across Texas to participate in the field test. The companies were all members of the NBAA, which was seen as having a positive influence on the response rate. Based on the results of the two surveys that were returned the survey instrument worked very well and only minor changes were necessary. A copy of the survey is in Appendix E.

SURVEY POPULATION AND SAMPLE SELECTION

Prior to mailing the survey, the appropriate sample population had to be identified. It was determined that the most appropriate person to receive the survey to was the chief pilot or the flight department manager as opposed to the any of the executives or employees who fly on the aircraft. This would ensure that any of the technical or aviation-related questions would be answered adequately with useful information.

The current fleet of business aircraft has never been so diverse. It ranges from the single-engine piston airplane used by small businesses to the trans-oceanic turbojets with 6,000 nautical mile capabilities. Since the purpose of this survey is to ascertain the needs of the users with respect to infrastructure, it logically follows that the sample should not follow from the smaller

end of the spectrum. Current facilities are already capable of handling the smaller aircraft. It is the larger aircraft and the more commonly flown aircraft that are of concern. Therefore, the sample for the survey was determined to be those aircraft registered as corporate aircraft that are at least multi-engine aircraft. This includes both piston and turbine engine aircraft. This was the case for the FAA database. For the NBAA membership list, all of the members in the region were selected. The underlying assumption was that most, if not all, of the NBAA members operated at least multi-engine piston aircraft. NBAA members tend to be more serious users of business aircraft who often operate larger, more powerful and technologically advanced aircraft.

The sources of the business aircraft users were the FAA and the National Business Aviation Association (NBAA). The most current FAA aircraft registration database was used as was the most current membership roster provided by the NBAA. Table 10 shows the sample selection by membership source.

TABLE 10
Sample Population Distribution by Source

Data Source	Population Size
FAA Aircraft Registration Database	1,870
NBAA Membership Roster	389
TOTAL	2,259

Additionally, the research team thought sending the survey to business aircraft users in the states surrounding Texas would be beneficial as well to capture business aviation activity that traveled to Texas from the region. The assumption was that any out-of-state aircraft would most likely come from one of the surrounding states. Table 11 shows the sample selection by state. The survey population includes 204 companies that use helicopters. The breakdown by state is presented in Table 12.

TABLE 11
Sample Population Distribution by State

State	Population Size
Texas	1,342
New Mexico	127
Oklahoma	324
Arkansas	237
Louisiana	229
TOTAL	2,259

TABLE 12
Helicopter Distribution by State

State	Population Size
Texas	118
New Mexico	10
Oklahoma	27
Arkansas	14
Louisiana	35
TOTAL	204

The above tables show that the total sample size is 2,259. No specific sampling procedure was employed. Rather, the entire population of the desired group was selected. Duplicate records were eliminated using sorting methods in a database program. The survey was mailed with an accompanying letter from the Aviation Division director giving the respondents approximately two weeks to respond and explaining the purpose and objectives of the survey. A copy of this letter is provided in Appendix E. The results of the survey follow in Chapter 4.

CHAPTER 4. SURVEY RESULTS

Of the 2,260 surveys mailed to business aircraft users, 236 surveys were returned. This is a response rate of a little more than 10%. This chapter will analyze the responses and present the results.

The Analysis is divided into six general categories to more clearly present the results and subsequent discussion. These six general categories are the users, the aircraft, the locations, the services, the overall system ratings, and the future outlook. It should be noted that there are a few airports included in the survey results that are now closed. These survey results are included simply as matter of record.

It should also be noted that some bias exists in the data simply by virtue of the limited responses. This is most clear in cases where only one user commented on a particular airport's facilities and services. For example, the reported data regarding the number of trips made to an airport and the condition and existence of its facilities and services may be the result of the response from one user. While this may not be representative of the airport itself, it is reported here as a matter of consistency. Overall, however, the reported activity levels at the various airports, as reported by the number of trips, appeared to be representative on a relative basis for many of the busiest airports. This is likely the case because the busiest and most sought after facilities were used by numerous businesses and were more widely represented in the responses. Nevertheless, the biases associated with low response rates may come in to play with some aspects of the results.

THE USERS

The business aircraft users responding to the survey totaled 236 businesses that varied in both type and size. The primary product or service of the respondents is shown in Table 13

TABLE 13
Primary Product/Service of Business Aircraft Users

Primary Product/Service	Number of Responses / %
Energy	28 / 12%
Professional (Legal, Medical, Consulting, etc.)	60 / 25%
Transportation	25 / 11%
Agriculture	9 / 4%
Construction/Engineering	20 / 9%
Manufacturing	32 / 14%
Environmental	6 / 3%
Technology	11 / 5%
Retail/Distribution	29 / 12%
No response given	16 / 7%
TOTAL	236 / 100% *

* Numbers do not add due to rounding

The most recent annual revenues of the respondents also varied. More than half reported annual revenues in excess of \$10 million with 22% having revenues exceeding \$100 million. Figure 1 shows the distribution of the respondents by revenues.

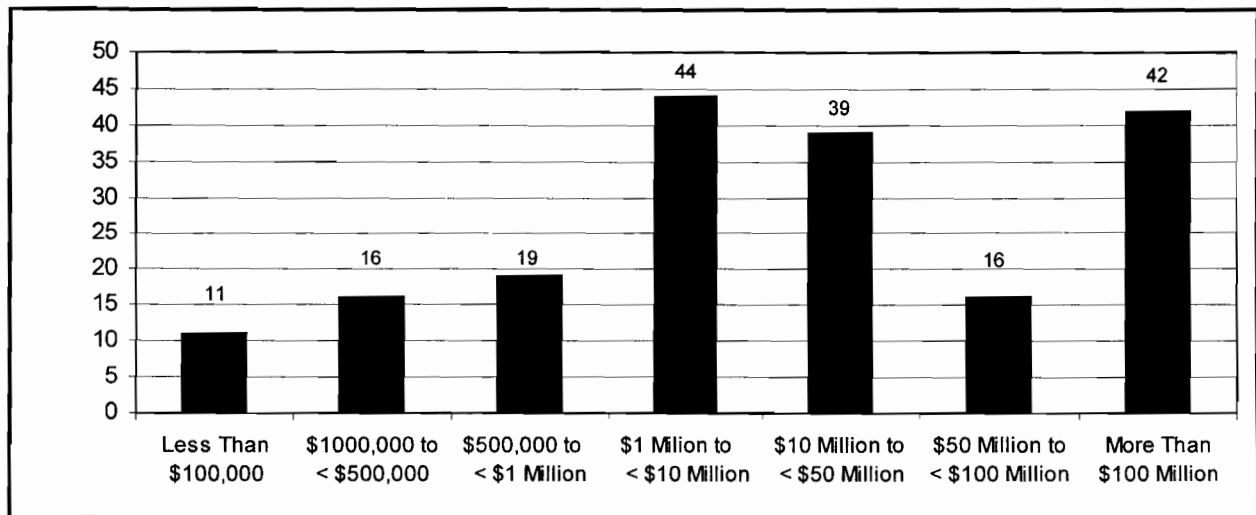


FIGURE 1. Most Recent Company Annual Revenues

Company size based on the number of employees was also reported. The larger companies used business aircraft more often than the smaller companies with nearly 40% of the respondents having more than 100 employees. However, 19% of the respondents had less than five employees.

showing that smaller companies benefit from business aircraft as well. Figure 2 shows the distribution according to the number of employees.

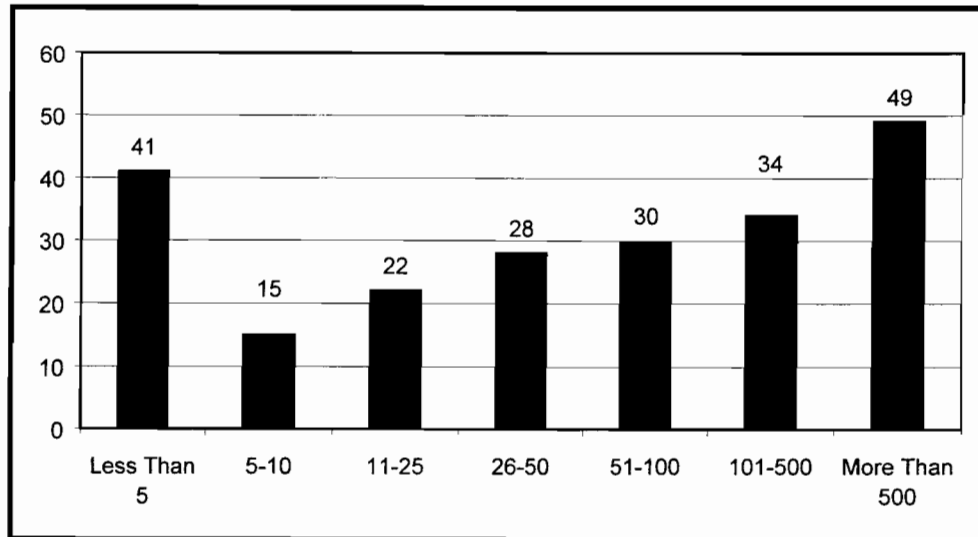


FIGURE 2. Total Company Employees

The reasons companies use business aircraft was also of interest. Results show that the vast majority of business aircraft users use their aircraft for transporting people. This result was largely expected. More than 73% of the time, these respondents use their aircraft for transporting employees. Another 14% use their aircraft for transporting clients while 3% use the aircraft for transporting goods. Approximately 10% of the time, the aircraft were used for other reasons. This includes personal use, maintenance flights, charitable reasons, and positioning among others. These results are summarized in Table 14.

**TABLE 14
Company Flying Time**

Company Flying Time Attributable to:	Percent
Employees	73.35%
Clients	13.83%
Goods	2.89%
Other	9.93%
TOTAL	100%

Business aircraft users clearly see benefits to operating their own aircraft. One of the biggest factors considered concerning whether or not to operate business aircraft is accessibility to rural or remote locations. Also, commercial airline links to some smaller cities may not be acceptable to some businesses because of frequency and convenience issues. Business aircraft allows companies to access additional marketplaces that cannot be served effectively, if at all, by the

commercial airlines. Among the respondents, 95% agreed that their business aircraft allowed them to reach communities, customers, and marketplaces that they would not have been able to if they were restricted to using commercial airlines. Though not surprising, it underscores the importance of smaller communities with no or limited airline service having adequate business aviation facilities.

As mentioned previously in this report, the past several years have seen tremendous growth in general aviation activity, especially in business aviation activity. Business aircraft users were asked about their use of aircraft in the past five years as well as their expected use in the next five years. Their factors behind their activity were also queried. A total of 75% of the respondents indicated that their use of business aircraft had increased over the past five years. The predominant factor was the growth/expansion of their business followed by good economic conditions. This is further illustrated in Figures 3 and 4.

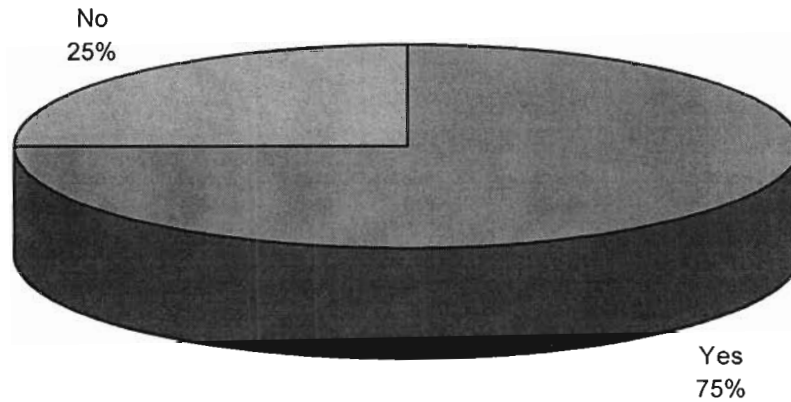


FIGURE 3. Has Business Aircraft Use Increased in the Past Five Years?

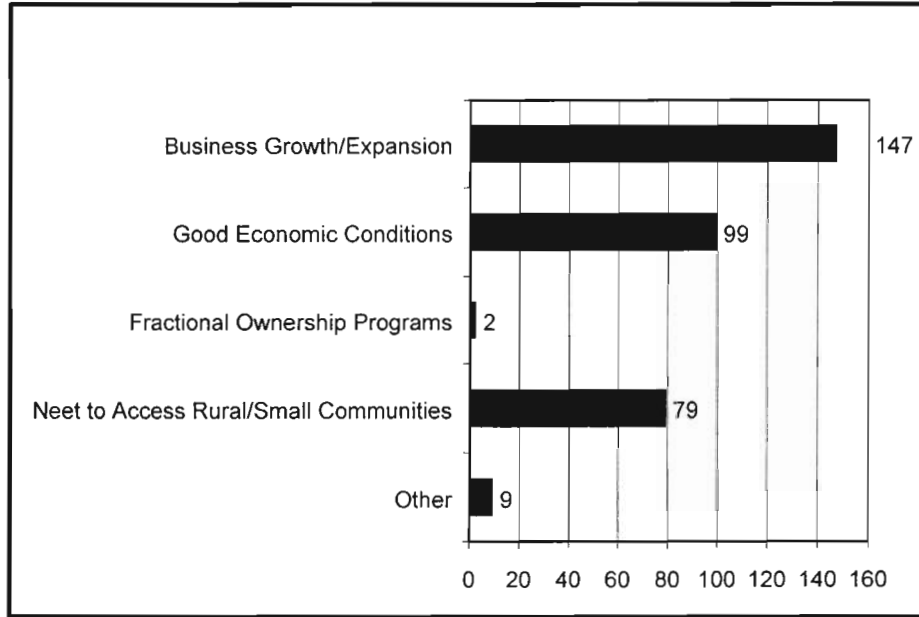


FIGURE 4: Factors Influencing Increased Activity

The survey also questioned expected activity in the next five years. A total of 74% of the responses indicate that they expect their use of business aircraft to increase over the next five years. This expectation is based largely on business growth and expansion plans. The results are further illustrated in Figures 5 and 6 below.

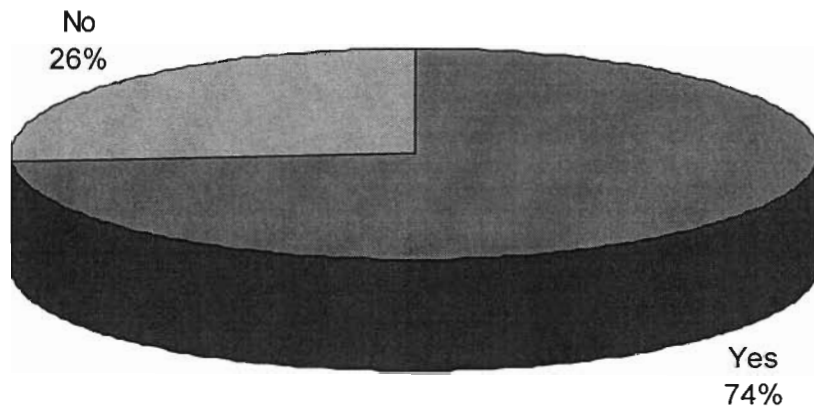


FIGURE 5. Will Business Aircraft Use Increase in the Next Five Years?

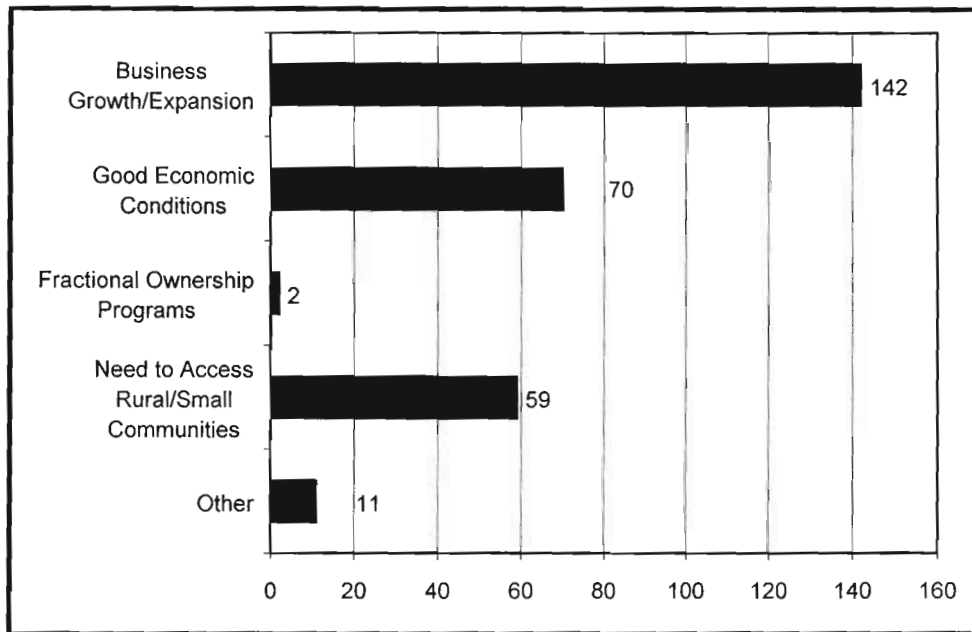


FIGURE 6. Factors Influencing Planned Increase in Activity

With fractional ownership becoming a popular option for companies, the survey asked business aircraft users about their current levels of participation. It should be noted that the FAA registration database used for this survey included owners of business aircraft. Naturally, a high level of fraction ownership participants would not be expected. The additional survey recipients were NBAA members and their ownership status was not made known. The survey indicated that 96% of the respondents did not participate in fractional ownership programs while 4% did participate. Again, this should not be surprising considering the make-up of the survey recipients. Additionally, of those responding that did not participate in fractional ownership programs most did not have any plans to participate in the future. Figures 7 and 8 show these results in more detail.

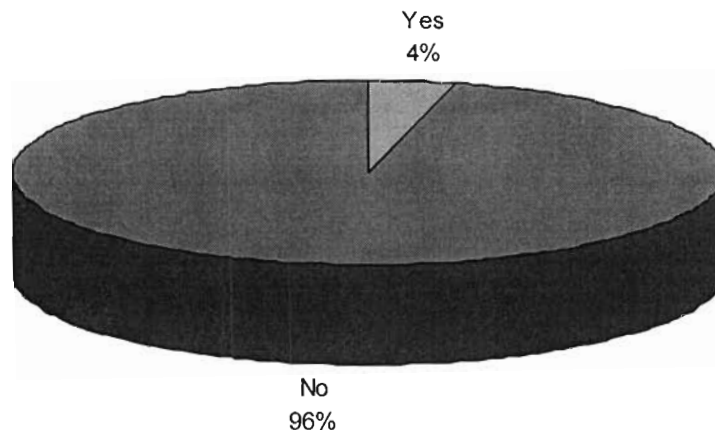


FIGURE 7. Fractional Ownership Program Participation

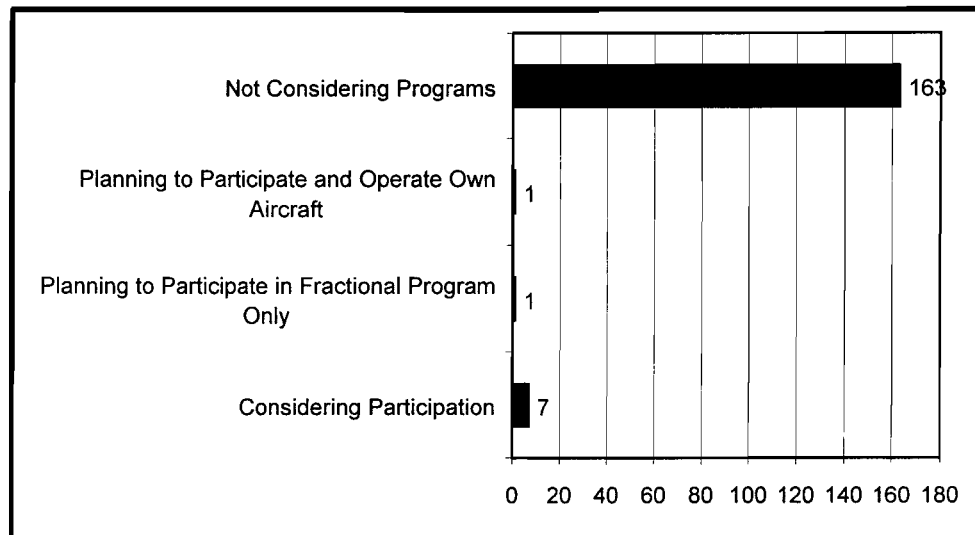


FIGURE 8. Plans of Non Participants

The survey responses include a diverse group. All types and sizes of businesses are represented with respect to industry, revenues and number of employees. It is clear that business aviation is important to all types of companies in conducting business in Texas. The responses concur with earlier statements about past growth in the industry. This growth has occurred in Texas as it has elsewhere across the country and world. All indications from the business aircraft users are that it will continue.

THE AIRCRAFT

The 236 survey responses accounted for a total of 333 aircraft. This includes both multi-engine turbine and multi-engine piston aircraft as well as helicopters. Figure 9 shows the different aircraft types from the survey.

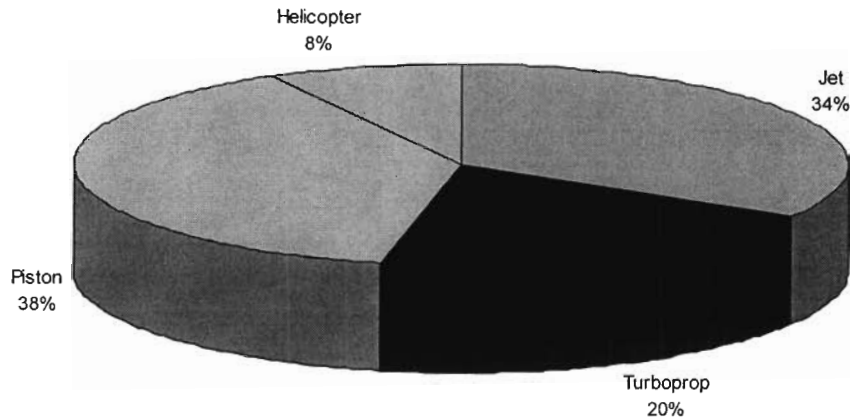


FIGURE 9. Types of Aircraft in Survey Responses

While the aggregate results of the survey are useful in many cases, it may also be important to display the results in certain categories. This is particularly the case with aircraft types. The characteristics of long-range jet aircraft are different than multi-engine piston aircraft that are used for business purposes. Therefore the results of the survey will be presented as a group and also by aircraft type. This will ensure that any specific needs of the particular segments of the business aviation community will be identified and not “washed” out in the collective data. Table 15 presents the aggregate results for all 333 of the respondents’ aircraft as well as the results for jet, turboprop, and piston aircraft as separate groups.

TABLE 15
Aircraft Characteristics

Characteristic	All	Turbine	Turboprop	Piston
Number of Seats	8	10	9	6
Typical Passenger Load	4	5	4	3
Annual Hours Flown	338	487	305	224
Runway Length	3,881	4,680	3,494	3,328
Runway Width	81	81	70	63
Maximum Gross Weight	16,982	32,564	12,198	6,040

As would be expected, turbine aircraft require more runway length and width followed by turboprops and piston aircraft in that order. Also, turbine aircraft are heavier, followed by turboprops and pistons. Jet aircraft are flown more often than the rest and approach nearly 500 hours per year on average.

As mentioned earlier, the survey includes 333 aircraft among the respondents. Of these, 89% were owned, 9% leased, and 2% were fractionally owned. Considering the make-up of the survey population, this result is not surprising. Obtaining a more representative sample would require information from fractional ownership operators. Typically, they are not forthcoming with such information as some may use fractional ownership for privacy reasons. The following pie chart in Figure 10 illustrates the breakdown.

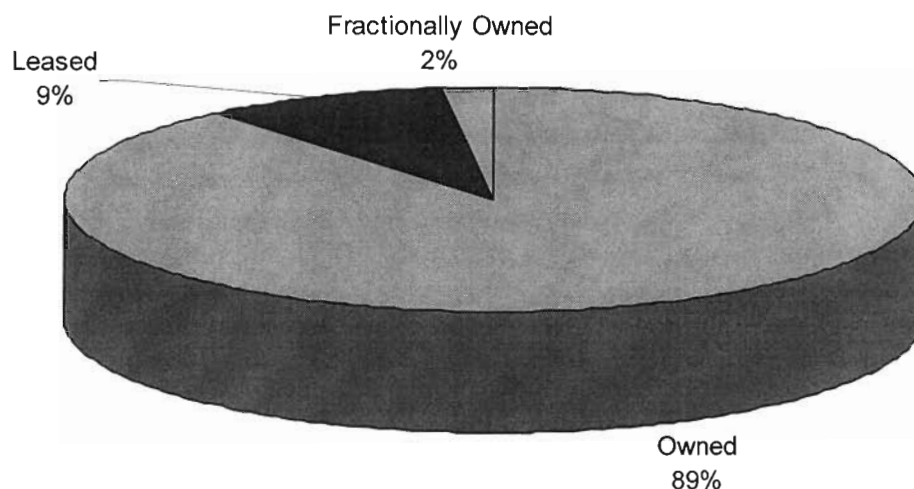


FIGURE 10. Ownership of Business Aircraft

The survey sought to identify what factors were involved in determining the aircraft's runway requirements. Figure 11 shows the factors and responses.

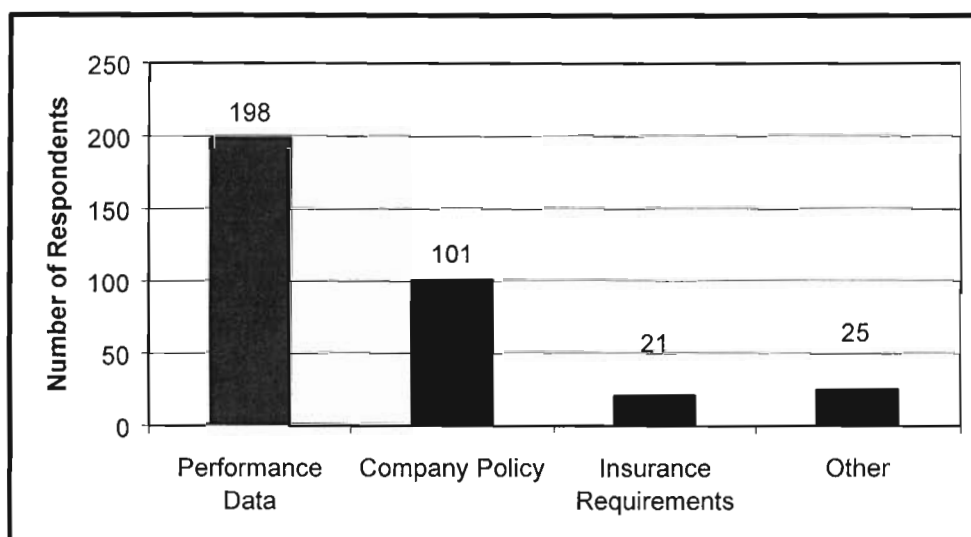


FIGURE 11. Factors Influencing Aircraft Runway Requirements

The factors included in the “other” category include convenience, safety, pilot requirements, FAA specifications, turning radius, density altitude, weather, runway condition, and pilot requirement/preference.

The final aircraft-related survey question pertains to the type of equipment onboard the aircraft. Figure 13 shows both the types of equipment business aircraft users currently have as well as the equipment they plan to install in the next year.

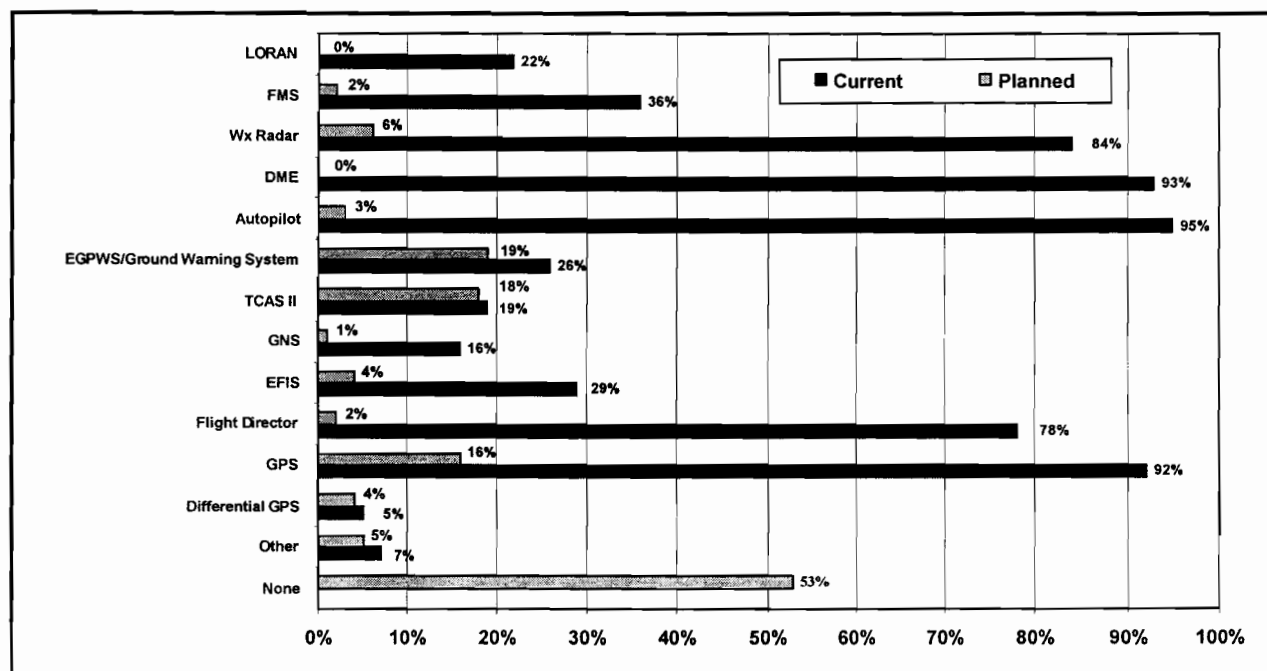


FIGURE 12. Types of Equipment on Business Aircraft-Current and Planned

AIRPORT LOCATIONS

The survey results are presented in two methods with respect to aircraft locations. The first is where the respondents based their aircraft. The second are the airport locations used by the respondents in the course of their business.

Based Aircraft

As indicated previously, 236 business aircraft users returned the surveys that accounted for 333 aircraft. Based aircraft locations totaled 114 locations in the southwest, 75 of them in Texas. The number of respondents totaled 240 (some listed more than one based aircraft location) with 201 giving locations in Texas. Table 16 shows the breakdown of based aircraft by state.

TABLE 16
Based Aircraft Location by State

State	Number of Respondents	Percent of Total
Texas	201	83.75%
Arkansas	15	6.25%
Louisiana	10	4.17%
New Mexico	5	2.08%
Oklahoma	8	3.33%
Other	1	0.42%
TOTAL	240	100%

Of the 114 different airports, 39 are out of state and 11 are private. These will be discussed in more detail later. According to the respondent's data, 44 of the locations had more than one based aircraft. These are shown in Table 17.

TABLE 17
Based Aircraft Locations

Airport Name	Number of Respondents	% of Total
Dallas Love Field	19	8%
Austin-Bergstrom International	10	4%
William P. Hobby, Houston	10	4%
San Antonio International	9	4%
Fort Worth Meacham International	8	3%
Houston George Bush Intercontinental	7	3%
Lubbock International	6	3%
Wiley Post (OK)	6	3%
Addison, Dallas	5	2%
Kickapoo Downtown Airpark, Wichita Falls	5	2%
Arlington Municipal	4	2%
Georgetown Municipal	4	2%
McKinney Municipal	4	2%
Amarillo International	3	1%
David Wayne Hooks Memorial (Private), Houston	3	1%
Denton Municipal	3	1%
Gregg County, Longview	3	1%
Lafayette Regional (LA)	3	1%
McGregor Municipal	3	1%
Midland International	3	1%
Richard Lloyd Jones Jr. (OK)	3	1%
San Marcos Municipal	3	1%
Tulsa International (OK)	3	1%
Waco Regional	3	1%
Abilene Regional	2	1%
Acadiana Regional (LA)	2	1%
Adams Field (AR)	2	1%
Baton Rouge metro-Ryan Field (LA)	2	1%
Clark Field Municipal, Stephenville	2	1%
Eastland Municipal	2	1%
Fort Smith Regional (AR)	2	1%
Memorial Field (AR)	2	1%
Montgomery County, Conroe	2	1%
Mt. Pleasant Municipal	2	1%
Redbird, Dallas	2	1%
Rogers Municipal (AR)	2	1%
San Angelo Regional-Mathis Field	2	1%
Scholes Field, Galveston	2	1%
Shreveport Regional (LA)	2	1%
Southeast Texas Regional, Beaumont/Port Arthur	2	1%
Springdale Municipal (AR)	2	1%
Sugar Land Municipal/Hull Field	2	1%
Tyler Pounds Field	2	1%
Will Rogers World (OK)	2	1%
TOTAL	170	73%

These 44 airports comprise 170 or 73% of all the based aircraft locations mentioned in the surveys. Commercial service airports dominate the top locations mentioned. The top 10 general aviation locations in Texas are shown in Table 18.

TABLE 18
Top 10 General Aviation Based Aircraft Locations in Texas

Airport Name	Number of Respondents
Fort Worth Meacham International	8
Addison, Dallas	5
Kickapoo Downtown Airpark, Wichita Falls	5
Arlington Municipal	4
Georgetown Municipal	4
McKinney Municipal	4
David Wayne Hooks Memorial, Houston	3
Denton Municipal	3
Gregg County, Longview	3
San Marcos Municipal	3
TOTAL	42

Of the based aircraft locations listed in the survey, 11 of the locations are private airports. All of the airports are in Texas and are listed in Table 19

TABLE 19
Top 10 Based Aircraft Locations in Texas - Private Airports

Airport Name	Number of Respondents
David Wayne Hooks Memorial, Houston	3
C F C Aviation Ranch-Liberty Hill	1
Clover Field, Houston	1
Diamond O Ranch	1
Northwest Regional, Roanoke	1
Northwest Regional Airport (AR)	1
Pearland-Skyway Manor	1
Tradewind, Amarillo	1
West Houston, Houston	1
Westheimer Air Park, Houston	1
Unnamed	1
TOTAL	11

Business aircraft users were also asked the criteria they used in determining where they based their aircraft. Of the 236 respondents, 231 answered the question. The results are summarized in Figure 13.

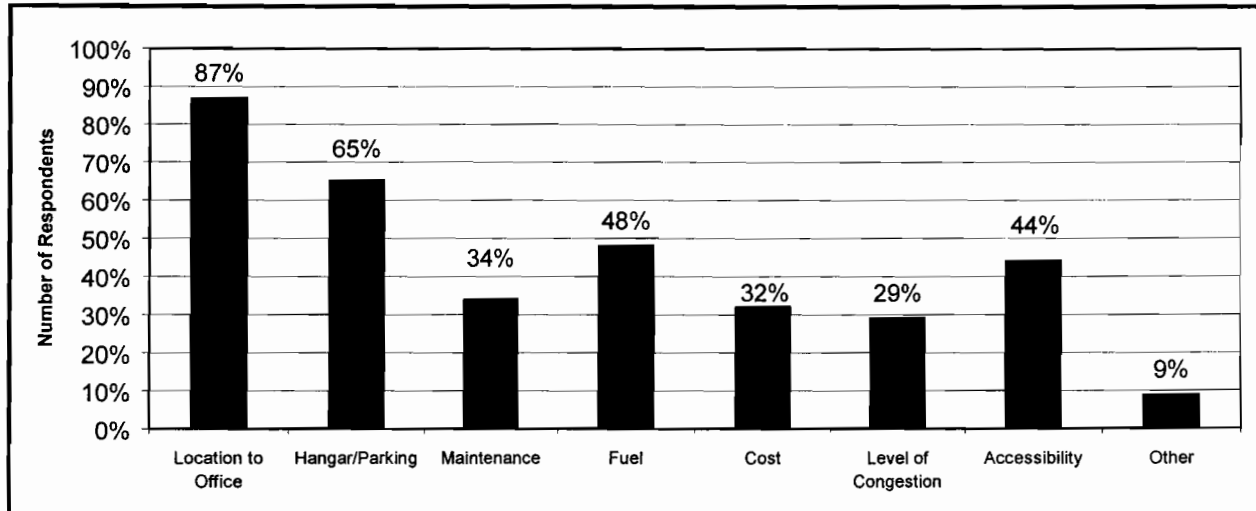


FIGURE 13. Criteria for Based Aircraft

The percentages do not round to 100 because respondents were asked to check all that apply. The vast majority of those responding said they based their aircraft at a particular airport because its location was convenient or close to their company's offices (87%). The only other reason garnering more than 50% was the suitability of the hangar and parking facilities (65%). Nine percent of those responding chose the location for other reasons. These other reasons include: the instrument approach, the crash/fire/rescue services, taxes, the "original plant was located there," and that it was the "only option at the time."

Locations Utilized

The survey also attempted to capture the airports where business aircraft users traveled to while conducting their business throughout Texas. The respondents accounted for a total of 54,318 annual trips to 238 different locations. All of the locations in Texas with more than 50 annual trips are listed in Table 20. The trips account for more than 96% of the total trips reported in the survey responses.

TABLE 20
Most Frequented Airports in Texas

Airport Name	Total Trips
Dallas Love Field	10,740
William P. Hobby, Houston	5,941
San Antonio International	4,509
Lubbock International	4,012
Austin-Bergstrom International	2,314
Fort Worth Meacham International	1,582
Houston George Bush Intercontinental	1,316
Scholes Field, Galveston	1,244
Amarillo International	1,219
Fort Worth Alliance	1,182
Midland International	905
El Paso International	886
Sugar Land Municipal/Hull Field	786
Addison, Dallas	725
Northwest Regional, Roanoke	600
TSTC Waco	600
Abilene Regional	598
Montgomery County, Conroe	593
Tyler Pounds Field	539
Corpus Christi International	536
Georgetown Municipal	498
Sheppard AFB/Wichita Falls Municipal	461
David Wayne Hooks Memorial, Houston	428
Fort Worth Spinks	428
Laredo International	417
Brownsville/South Padre Island International	381
San Angelo Regional-Mathis Field	380
Kickapoo Downtown Airpark, Wichita Falls	378
San Marcos Municipal	368
Hemphill County, Canadian	352
Eastland Municipal	328
Dallas-Fort Worth International	325
Brenham Municipal	310
Clover Field, Houston	300
Victoria Regional	287
Arlington Municipal	286
Jefferson County, Beaumont/Port Arthur	276
Winston Field Municipal, Snyder	251
Denton Municipal	243
Waco Regional	237
Sulphur Springs Municipal	220
C. David Campbell Field-Corsicana Municipal	213
Alice International	210

Airport Name	Total Trips
Grand Prairie Municipal	200
Harrison County, Marshall	200
McKinney Municipal	198
New Braunfels Municipal	190
Gregg County, Longview	171
Rio Grande Valley International, Harlingen	168
Redbird, Dallas	158
Draughon-Miller Municipal, Temple	156
Littlefield Municipal	153
Cherokee County, Jacksonville	150
Graham Municipal	150
Mt. Pleasant Municipal	143
Brooks County, Falfurrias	126
Kleberg County, Kingsville	119
McAllen Miller International	117
Easterwood Field, College Station	103
Castroville Municipal	100
Tradewind, Amarillo	92
Alpine-Casparis Municipal	90
West Houston	89
Gainesville Municipal	80
McMahon-Wrinkle, Big Spring	80
Cotulla-La Salle County	77
McGregor Municipal, Waco	72
Sonora Municipal	70
Midland Airpark	66
Texarkana Regional-Webb Field	65
Perryton Ochiltree County	64
Aransas County, Rockport	62
Fayette Regional Air Center, La Grange	55
Mineral Wells Municipal	55
Brownwood Regional	54
Del Rio International	54
Culberson County, Van Horn	50
Lampasas Municipal	50
TOTAL	52,331

The top five are all commercial service airports. The top general aviation airport destinations are shown in Table 21.

TABLE 21
Most Frequented General Aviation Airports in Texas

Airport Name	Total Trips
Fort Worth Meacham International	1,582
Scholes Field, Galveston	1,244
Fort Worth Alliance	1,182
Sugar Land Municipal/Hull Field	786
Addison, Dallas	725
Northwest Regional, Roanoke	600
Montgomery County, Conroe	593
Georgetown Municipal	498
David Wayne Hooks Memorial, Houston	428
Fort Worth Spinks	428
Kickapoo Downtown Airpark, Wichita Falls	378
San Marcos Municipal	368
Hemphill County, Canadian	352
Eastland Municipal	328
Brenham Municipal	310
Clover Field, Houston	300
Arlington Municipal	286
Jefferson County, Beaumont/Port Arthur	276
Winston Field Municipal, Snyder	251
Denton Municipal	243
Waco Regional	237
Sulphur Springs Municipal	220
C. David Campbell Field-Corsicana Municipal	213
Alice International	210
Grand Prairie Municipal	200
Harrison County, Marshall	200
McKinney Municipal	198
New Braunfels Municipal	190
Gregg County, Longview	171
Rio Grande Valley International, Harlingen	168
Redbird, Dallas	158
Draughon-Miller Municipal, Temple	156
Littlefield Municipal	153
Cherokee County, Jacksonville	150
Graham Municipal	150
Mt. Pleasant Municipal	143

Airport Name	Total Trips
Brooks County, Falfurrias	126
Kleberg County, Kingsville	119
Castroville Municipal	100
Tradewind, Tradewind	92
Alpine-Casparis Municipal	90
West Houston	89
Gainesville Municipal	80
McMahon-Wrinkle, Big Spring	80
Cotulla-La Salle County	77
McGregor Municipal, Waco	72
Sonora Municipal	70
Midland Airpark	66
Perryton Ochiltree County	64
Aransas County, Rockport	62
Fayette Regional Air Center, La Grange	55
Mineral Wells Municipal	55
Brownwood Regional	54
Del Rio International	54
Culberson County, Van Horn	50
Lampasas Municipal	50
TOTAL	15,580

These general aviation airports receiving 50 or more annual trips account for approximately 30% of the trips reported in the survey.

These business aircraft users were asked why they selected these airports. They were provided a range of answers as well as an opportunity to comment on answers that were not listed. Of the 236 respondents, 233 answered the question. They were asked to check all of the answers that applied, so responses will not total 100%. A total of 82% of the respondents selected the facility because it was convenient/ideal for their business. These responses are shown in Figure 14 below.

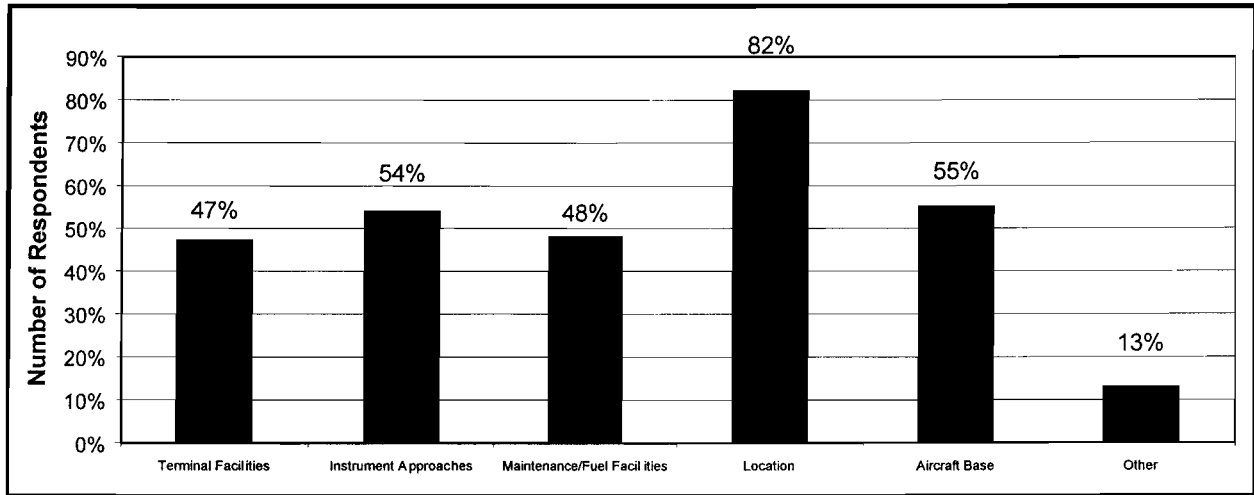


FIGURE 14. Criteria Considered When Selecting Airports

Important data was also collected on airports and locations regarding their condition and level of acceptability. When asked about any problems accessing airports, 78% of the respondents said they have had no problems. A total of 22% mentioned some access problems. The following table summarizes the airports mentioned and the reasons given for these access problems.

TABLE 22
Airports and Associated Access Problems

Airport Name	Accessibility Problem
A. L. Mangham Jr. Regional, Nacogdoches	Needs RCO for receiving IFR clearances
Addison, Dallas	Approach is too crowded
Andrau Airpark, Houston	Poor runway condition
Arlington Municipal	Runway is too short
Austin-Bergstrom International	Need public use helipad in downtown
Austin-Bergstrom International	No general aviation hangars available
Austin-Bergstrom International	No hangars
Austin-Bergstrom International	Arrivals delayed due to mishandled traffic
Austin-Bergstrom International	Too far out from business on north side
Austin-Bergstrom International	No hangar or ramp space
Austin-Bergstrom International	General aviation area very inconvenient to the commercial terminal
Austin-Bergstrom International	No general aviation services or hangar space available
Brooks County, Falfurrias	Limited runway space
Brooks County, Falfurrias	Needs a better IFR approach
C. David Campbell Field – Corsicana Municipal	Problems setting IFR clearances on ground
Cherokee County, Jacksonville	Weather is below minimum for non-precision approach
Commerce Municipal	Runway too short
Dallas-Fort Worth International	General Aviation unwanted and no facilities
Dallas-Fort Worth International	Same as everybody else
Dallas-Fort Worth International	Refueling takes too long
Dallas-Fort Worth International	Poor FBO
Dallas-Fort Worth International	No service
Denver City	Narrow runway with poor surface
Eastland Municipal	Runway too short
Ellington Field, Houston	Hobby controls airspace and gives low priority to Ellington
Floydada Municipal	Short, narrow runway with poor surface
Fort Worth Meacham International	Entry/departure is inconvenient due to low altitude and turbulence
Garner field, Uvalde	No weather reporting
Georgetown Municipal	Needs better instrument approach
Georgetown Municipal	Excessive traffic, non-towered airport, unsafe
Georgetown Municipal	No room to park, taxiways too small
Graham Municipal	Poor runway conditions and no weather services

Airport Name	Accessibility Problem
Harrison County, Marshall	IFR approach – ILS needed
Houston George Bush Intercontinental	Ground and air delays
Houston George Bush Intercontinental	Hold due to ATC delays
Houston George Bush Intercontinental	Continental airline forces delays
Kerrville Municipal/Louis Schreiner Field	Inadequate instrument approach
Marian Airpark, Wellington	Short, narrow runway with poor surface
Maverick County Memorial International, Eagle Pass	No instrument approach
Maverick County Memorial International, Eagle Pass	No weather reporting or instrument approach
Mt. Pleasant Municipal	Needs RCO for receiving IFR clearances
Orange County	Excessive loose gravel causing prop damage
Ozona Municipal	IFR Approach - ILS Needed
Perryton Ochiltree County	No straight GPS approaches
Perryton Ochiltree County	Needs additional instrument approaches
Palacios Municipal	Fuel pump sometimes doesn't work
Pineland Municipal	No Instrument Approach
Possum Kingdom, Graford	Runway too short, no fuel
Rockwall Municipal	No ILS, runway not adequate
Schlemeyer Field, Odessa	No ILS approach
Schlemeyer Field, Odessa	Limited runway space
Scholes Field, Galveston	Fuel, credit, car service
Sonora Municipal	Limited runway space
Southeast Texas Regional, Beaumont/Port Arthur	Fuel, credit, car service
Tradewind, Amarillo	Poor runway condition
Tulia/Swisher County Municipal	Short, narrow runway with poor surface

Business aircraft users, perhaps more than other segments of the general aviation community, rely heavily on the facilities and services at airports they use. And as shown previously, they play an integral part at the airports they chose to both base their aircraft and use in the course of conducting their business. The following tables indicate those airports that have garnered comment from the business aircraft community in Texas as having unacceptable facilities. Subsequent tables later in this section will focus on airport services.

TABLE 23
Airports with Unacceptable NAVAIDS

Airport Name	Number Reported
Maverick County Memorial International, Eagle Pass	2
Perryton Ochiltree County	2
Pineland Municipal	2
Arlington Municipal	1
Beeville Municipal	1
Brooks County, Falfurrias	1
Comanche County-City	1
Cotulla-La Salle County	1
David Wayne Hooks Memorial, Houston	1
Denver City	1
Duval-Freer	1
Gainesville Municipal	1
Mt. Pleasant Municipal	1
Mustang Beach, Port Aransas	1
New Braunfels Municipal	1
Panola County-Sharpe Field, Carthage	1
Stinson Municipal	1
Texarkana Regional	1
Tulia/Swisher County Municipal	1
Winnsboro Municipal	1
Zapata County	1

TABLE 24
Airports with Unacceptable Visual Approach Aids

Airport Name	Number Reported
Mt. Pleasant Municipal	2
Pineland Municipal	2
Arlington Municipal	1
Austin-Bergstrom International	1
Brooks County, Falfurrias	1
Clifton Municipal	1
David Wayne Hooks Memorial, Houston	1
Duval-Freer	1
Eastland Municipal	1
Georgetown Municipal	1
Graham Municipal	1
Houston County, Crockett	1
Houston Gulf	1
Houston Southwest	1
New Braunfels Municipal	1
Perryton Ochiltree County	1
Sonora Municipal	1
Stinson Municipal, San Antonio	1
Sulphur Springs Municipal	1
Town and Country Airpark, Lubbock	1

TABLE 25
Airports with Unacceptable Terminal Facilities

Airport Name	Number Reported
Dallas-Fort Worth International	3
Georgetown Municipal	3
Possum Kingdom, Graford	2
Austin-Bergstrom International	1
Brooks County, Falfurrias	1
Charles R. Johnson, Port Mansfield	1
Clark Field Municipal, Stephenville	1
Comanche County-City	1
Denton Municipal	1
Eastland Municipal	1
Fort Worth Meacham	1
Graham Municipal	1
Grayson County, Sherman/Denison	1
Harrison County, Marshall	1
Kickapoo Downtown Airpark, Wichita Falls	1
Lago Vista - Rusty Allen	1
McMahon-Wrinkle, Big Spring	1
Palacios Municipal	1
Perryton Ochiltree County	1
Pineland Municipal	1
Scholes Field, Galveston	1
Sonora Municipal	1
Tradewind, Amarillo	1
Winnsboro Municipal	1

TABLE 26
Airports with Unacceptable Runway Length

Airport Name	Times Reported
Cotulla-La Salle County	2
Mt. Pleasant Municipal	2
Andrau Airpark, Houston	1
Arlington Municipal	1
Austin-Bergstrom International	1
Brooks County, Falfurrias	1
Charles R. Johnson, Port Mansfield	1
Commerce Municipal	1
Duval-Freer	1
Eastland Municipal	1
Floydada Municipal	1
Georgetown Municipal	1
Graham Municipal	1
Kickapoo Downtown Airpark, Wichita Falls	1
Midland Airpark	1
Montgomery County, Conroe	1
Mustang Beach, Port Aransas	1
New Braunfels Municipal	1
Perryton Ochiltree County	1
Possum Kingdom, Graford	1
Sonora Municipal	1
Stinson Municipal, San Antonio	1
Tulia/Swisher County Municipal	1
West Houston	1

TABLE 27
Airports with Unacceptable Runway Width

Airport Name	Times Reported
Andrau Airpark, Houston	1
Charles R. Johnson, Port Mansfield	1
Cotulla-La Salle County	1
Duval-Freer	1
San Marcos Municipal	1

TABLE 28
Airports with Unacceptable Surface Condition

Airport Name	Times Reported
Andrau Airpark, Houston	1
Austin-Bergstrom International	1
Charles R. Johnson, Port Mansfield	1
Cotulla-La Salle County	1
David Wayne Hooks Memorial, Houston	1
Denver City	1
Duval-Freer	1
Eastland Municipal	1
Floydada Municipal	1
Graham Municipal	1
Harrison County, Marshall	1
Kickapoo Downtown Airpark, Wichita Falls	1
Laredo International	1
Marian Airpark, Wellington	1
Mt. Pleasant Municipal	1
Orange County	1
Pineland Municipal	1
San Marcos Municipal	1
Town and Country Airpark, Lubbock	1
Tradewind, Amarillo	1

TABLE 29
Airports with Unacceptable Runway Lighting

Airport Name	Times Reported
David Wayne Hooks Memorial, Houston	2
Aero Country, McKinney	1
Brooks County, Falfurrias	1
Charles R. Johnson, Port Mansfield	1
Cotulla-La Salle County	1
Duval-Freer	1
Edwards County, Rocksprings	1
Graham Municipal	1
McMahon-Wrinkle, Big Spring	1
Mt. Pleasant Municipal	1
Pineland Municipal	1
Sonora Municipal	1
Waco TSTC	1
Winnsboro Municipal	1

TABLE 30
Airports with Unacceptable Support Services

Airport Name	Times Reported
Austin-Bergstrom International	5
Dallas-Fort Worth International	4
Brooks County, Falfurrias	2
Gainesville Municipal	2
Georgetown Municipal	2
Abilene Regional	1
Andrau Airpark, Houston	1
Arlington Municipal	1
Brownsville/South Padre Island International	1
Charles R. Johnson, Port Mansfield	1
Clifton Municipal	1
Comanche County-City	1
Duval-Freer	1
Eastland Municipal	1
Hamilton Municipal	1
Houston County, Crockett	1
Llano Municipal	1
Maverick County Memorial International, Eagle Pass	1
McMahon-Wrinkle, Big Spring	1
Pineland Municipal	1
Possum Kingdom, Graford	1
San Angelo Regional – Mathis Field	1
Stephens County, Breckenridge	1
Tradewind, Amarillo	1
Winnsboro Municipal	1

TABLE 31
Airports with Unacceptable Fuel Availability

Airport Name	Times Reported
Austin-Bergstrom International	2
Dallas-Fort Worth International	2
Pineland Municipal	2
Charles R. Johnson, Port Mansfield	1
Clifton Municipal	1
Duval-Freer	1
Houston County, Crockett	1
Llano Municipal	1
Maverick County Memorial International, Eagle Pass	1
McMahon-Wrinkle, Big Spring	1
Mustang Beach, Port Aransas	1
Parker County, Weatherford	1
Possum Kingdom, Graford	1
Scholes Field, Galveston	1
Upton County, McCamey	1
Winnsboro Municipal	1

TABLE 32
Airports with Unacceptable Fuel Price

Airport Name	Times Reported
Dallas Love Field	10
Austin-Bergstrom International	7
Houston George Bush Intercontinental	5
Dallas-Fort Worth International	3
Addison, Dallas	1
El Paso International	1
McKinney Municipal	1
Midland International	1
Pineland Municipal	1
San Antonio International	1
Scholes Field, Galveston	1
Southeast Texas Regional, Beaumont/Port Arthur	1
Sugar Land Municipal	1

The following two tables in this section concern airports and locations not suitable for business aircraft users. When asked about airports in Texas that cannot be used because of short runways or other inadequate facilities, 81% of the respondents indicated that there are none leaving 19% to answer yes. Table 33 shows the airports mentioned as having inadequacies and the specific identified inadequacies.

TABLE 33
Airports Inadequate for Business Use

Airport	Comments
Andrau Airpark, Houston	Houston
Andrau Airpark, Houston	Poor runway conditions, courtesy car, worker's attitudes
Arlington Municipal	Runway too short
Arlington Municipal	No approaches
Austin-Bergstrom International	Needs small jet/turbo prop airport
Austin-Bergstrom International	Out of the loop
Austin-Bergstrom International	Lack of facilities keeps me from basing there
Cameron Municipal Airpark	None Given
Charles R. Johnson, Port Mansfield	None Given
Charles R. Johnson, Port Mansfield	Short runways
City/County	None Given
Commerce Municipal	Runway too short
Cotulla-La Salle County	None Given
Cotulla-La Salle County	Unacceptable when temperature exceeds 90°
Cypress River	Trees too tall & too close
Dallas-Fort Worth International	None Given
Dallas-Fort Worth International	Ground transport, access/public, high fuel prices
Dilley Airpark	No instrument approach
Eagle Pass Municipal	Old airport inadequate
Eastland Municipal	Too short 90% of the time
Georgetown Municipal	Doesn't meet requirements for business jets
Georgetown Municipal	Parking, taxiway, runway length
Grand Prairie Municipal	Useable, but short
Hamlin Municipal	Will not be usable if we purchase a citation jet
Huntsville Municipal	None Given
Jasper County Bell Field	Runway too short, can't handle the weight
Kermit	Runway torn up
Lakeway, Austin	Too short
Lipscomb County, Follett	Short runway, no fuel, no facilities, ramp not clean
Livingston Municipal	Runway too short
Midland Airpark	Runways not strong enough for G-IV
Mustang Beach, Port Aransas	None Given
Palestine Municipal	Not good FBO there

Airport	Comments
Panola County-Sharpe Field, Carthage	Runway too short
Perryton Ochiltree County	500' runway 2,900 MSL
Porter, Williams	No fuel, runway too short
Rio Grande Valley International, Harlingen	Runway too short
Robert Mueller, Austin	Need to reopen as GA "reliever"
Robert Mueller, Austin	Closed
Sabine Pass (Private)	Runway too short
Wieser Air Park, Houston	Short, narrow, no taxiways

Table 34 shows the locations where respondents desired access but no airport was available. When asked to name location where there was no access, only 13% identified locations in the state while 87% said they had access to all desired locations in Texas. The locations or regions without access are shown in the table below along with the general comments, if any, that accompanied them.

TABLE 34
Locations Needing Access with No Airport

Location/Region	Comments
Austin	Need airport in addition to Bergstrom
Austin	Need airport on north side
Austin	Downtown
Barrier Islands	Airports are too small or not maintained
Baytown	Current airport inadequate for access
Big Bend National Park	None
Canyon	None
Dallas-Fort Worth	We fly into Dallas Love or Meacham to avoid the inconveniences
Edna	None
El Campo	None
Hemphill	None
Hockley	None
Houston	Need downtown heliport
Katy	None
Kingwood	None
Lytle	None

Location/Region	Comments
Most coastal region and Big Bend	None
Quitaque	None
South Padre Island	None
Sabine Pass	None
Sanger	None
Texas City/La Marque	None
Three Rivers	None
West Houston	None

The previous two tables indicate that the current airport system does a very good job of providing adequate facilities around the state to serve the needs of business aircraft users and general aviation in general.

The following table in this section concerns private airports. When asked what private airports they use, if any, 29% of the respondents indicated they did use private airports. These airports are listed in Table 35 along with the reasons why they are used.

TABLE 35
Private Airports and Reasons for Use

Airport Name	Reasons for Use
Aero Country, McKinney	Excellent mechanic
Canyon Ranch, Sonora	None given
Chaney, Marathon	None given
Cibola Creek Ranch, Presidio	Convenience
Clark Sky Ranch, Sealy	Convenience
Clover Field, Houston	Convenience, homebase
David Wayne Hooks Memorial, Houston	None given
Evadale Landing Strip	Company owned
Fort Worth Tandy	None given
Horeshoe Bay Airpark	Weather alternative; maintenance
Houston Southwest	None given
Kickapoo Downtown Airpark, Wichita Falls	None given
Lajitas	Business
Lakeway Airpark, Austin	Convenience; purchase fuel
Liberty Hill, Burnet County	Homebase
Lone Star Steel Company, Lone Star	Business
Parker County, Weatherford	None given
Polly Ranch, Friendswood	None given
Possum Kingdom, Graford	Only access to area
River Bend Ranch, Brady	Company owned
Rush Ranch	Convenience
Sabine Pass	None given
Scrappin Valley Hunting Lodge, Wiergate	Recreation
Sportsman's World, Palo Pinto	None given
Town and Country Airpark, Lubbock	Convenience
Tradewind, Amarillo	None given
Weiser Air Park, Houston	None given

In some cases, airports were not given but reasons for using private facilities were. These reasons include business purposes, vacation, pilot needs, easy access, less crowded, and no fees. Additionally, some of the aforementioned airports were listed by more than one respondent but the results were summarized.

Airport Services

The following tables shows the airports listed as “unacceptable” or “not available” in providing certain services to general aviation and business aviation users. This information is important in attracting business users as well as general aviation in general.

TABLE 36
Airports with Unacceptable or Unavailable Restrooms

Airport Name	Number Reported
Georgetown Municipal	3
Pineland Municipal	2
Brazoria County, Angleton/Lake Jackson	1
Brooks County, Falfurrias	1
Cameron Municipal Airpark	1
Clifton Municipal	1
Dallas-Fort Worth International	1
Duval-Freer	1
Garner Field, Uvalde	1
Grayson County, Sherman/Denison	1
Harrison County, Marshall	1
Jim Hogg County, Hebbronville	1
Kickapoo Downtown Airpark, Wichita Falls	1
Kleberg County, Kingsville	1
Lago Vista – Rusty Allen	1
Palacios Municipal	1
Scholes Field, Galveston	1
Sonora Municipal	1
Winnsboro Municipal	1

TABLE 37
Airports with Unacceptable or Unavailable Food/Drink Services

Airport Name	Number Reported
Georgetown Municipal	3
Dallas-Fort Worth International	2
Lago Vista - Rusty Allen	2
Maverick County Memorial International, Eagle Pass	2
Alice International	1
Aransas County, Rockport	1
Brooks County, Falfurrias	1
Coleman Municipal	1
Clifton Municipal	1
Cameron Municipal Airpark	1
Denton Municipal	1
Duval-Freer	1
Grayson County, Sherman/Denison	1
Harrison County, Marshall	1
Kickapoo Downtown Airpark, Wichita Falls	1
Mt. Pleasant Municipal	1
Palacios Municipal	1
Panola County-Sharpe Field, Carthage	1
Perryton Ochiltree Municipal	1
Pineland Municipal	1
Possum Kingdom, Graford	1
Scholes Field, Galveston	1
Sonora Municipal	1
Tyler County	1
Wharton Regional	1
Winnsboro Municipal	1

TABLE 38
Airports with Unacceptable or Unavailable Telephones

Airport Name	Number Reported
Pineland Municipal	2
Brooks County, Falfurrias	1
Cameron Municipal Airpark	1
Clifton Municipal	1
Dallas-Fort Worth International	1
Duval-Freer	1
Georgetown Municipal	1
Houston County, Crockett	1
Kickapoo Downtown Airpark, Wichita Falls	1
Lago Vista - Rusty Allen	1
Maverick County Memorial International, Eagle Pass	1
Palacios Municipal	1
Winnsboro Municipal	1

TABLE 39
Airports with Unacceptable or Unavailable Courtesy Car

Airport Name	Number Reported
Dallas-Fort Worth International	4
Austin-Bergstrom International	2
Coleman Municipal	2
Lago Vista - Rusty Allen	2
Maverick County Memorial International, Eagle Pass	2
A.L. Mangham Jr. Regional, Nacogdoches	1
Alice International	1
Aransas County, Rockport	1
Brooks County, Falfurrias	1
Cameron Municipal Airpark	1
Clifton Municipal	1
Denton Municipal	1
Duval-Freer	1
Ft. Stockton-Pecos County	1
Georgetown Municipal	1
Grayson County, Sherman/Denison	1
Harrison County, Marshall	1
Kickapoo Downtown Airpark, Wichita Falls	1
Panola County-Sharpe Field, Carthage	1
Perryton Ochiltree County	1
Possum Kingdom, Graford	1
Scholes Field, Galveston	1
Sonora Municipal	1
Wharton Regional	1
Winnsboro Municipal	1
Zapata County	1

TABLE 40
Airports with Unacceptable or Unavailable Rental Car

Airport Name	Number Reported
Brooks County, Falfurrias	2
Coleman Municipal	2
Dallas-Fort Worth International	2
Maverick County Memorial International, Eagle Pass	2
Austin-Bergstrom International	1
Cameron Municipal Airpark	1
Clifton Municipal	1
Duval-Freer	1
Ft. Stockton-Pecos County	1
Harrison County, Marshall	1
Houston County, Crockett	1
Kickapoo Downtown Airpark, Wichita Falls	1
Lago Vista - Rusty Allen	1
Lakeway Airpark, Austin	1
McGregor Executive, Waco	1
McKinney Municipal	1
Mineral Wells Municipal	1
Montgomery County, Conroe	1
Pineland Municipal	1
Possum Kingdom, Graford	1
Sonora Municipal	1
Stinson Municipal, San Antonio	1
Winnsboro Municipal	1
Zapata County	1

TABLE 41
Airports with Unacceptable or Unavailable Taxi Service

Airport Name	Number Reported
Austin-Bergstrom International	2
Coleman Municipal	2
Dallas-Fort Worth International	2
Maverick County Memorial International, Eagle Pass	2
Brooks County, Falfurrias	1
Cameron Municipal Airpark	1
Clifton Municipal	1
Cotulla-LaSalle County	1
Denton Municipal	1
Del Rio International	1
Duval-Freer	1
Fort Worth Meacham	1
Ft. Stockton-Pecos County	1
Grayson County, Sherman/Denison	1
Houston County, Crockett	1
Kickapoo Downtown Airpark, Wichita Falls	1
Lago Vista - Rusty Allen	1
Lakeway Airpark, Austin	1
Llano Municipal	1
McGregor Executive, Waco	1
Mineral Wells Municipal	1
Montgomery County, Conroe	1
Pineland Municipal	1
Possum Kingdom, Graford	1
Sonora Municipal	1
Stinson Municipal, San Antonio	1
Winnsboro Municipal	1
Winston Field, Snyder	1
Zapata County	1

TABLE 42
Airports with Unacceptable or Unavailable Television Services

Airport Name	Number Reported
Georgetown Municipal	3
Brooks County, Falfurrias	2
Coleman Municipal	2
Del Rio International	2
Aransas County, Rockport	1
Cameron Municipal Airpark	1
Clifton Municipal	1
Cotulla-La Salle County	1
Dallas-Fort Worth International	1
Denton Municipal	1
Duval-Freer	1
Grayson County, Sherman/Denison	1
Harrison County, Marshall	1
Houston County, Crockett	1
Kickapoo Downtown Airpark, Wichita Falls	1
Maverick County Memorial International, Eagle Pass	1
Mustang Beach, Port Aransas	1
Palacios Municipal	1
Pineland Municipal	1
Redbird, Dallas	1
Tradewind, Amarillo	1
Winnsboro Municipal	1
Zapata County	1

TABLE 43
Airports with Unacceptable or Unavailable Waiting Area

Airport Name	Number Reported
Dallas-Fort Worth International	3
Del Rio International	2
Georgetown Municipal	2
Brooks County, Falfurrias	1
Cameron Municipal Airpark	1
Clifton Municipal	1
Coleman Municipal	1
Cotulla-La Salle County	1
Denton Municipal	1
Duval-Freer	1
Garner Field, Uvalde	1
Grayson County, Sherman Denison	1
Harrison County, Marshall	1
Houston County, Crockett	1
Kickapoo Downtown Airpark, Wichita Falls	1
Maverick County Memorial International, Eagle Pass	1
Palacios Municipal	1
Pineland Municipal	1
Sonora Municipal	1
Tradewind, Amarillo	1
Winnsboro Municipal	1

TABLE 44
Airports with Unacceptable or Unavailable Meeting Rooms

Airport Name	Number Reported
Aransas County, Rockport	2
Coleman Municipal	2
Dallas-Fort Worth International	2
Del Rio International	2
Denton Municipal	2
Austin-Bergstrom International	1
Brenham Municipal	1
Brooks County, Falfurrias	1
Cameron Municipal Airpark	1
Cherokee County, Jacksonville	1
Clifton Municipal	1
Cotulla-La Salle County	1
David Wayne Hooks Memorial, Houston	1
Duval-Freer	1
Fayette Regional Air Center, La Grange	1
Georgetown Municipal	1
Grayson County, Sherman/Denison	1
Harrison County, Marshall	1
Houston County, Crockett	1
Jim Hogg County, Hebbronville	1
Kickapoo Downtown Airpark, Wichita Falls	1
Kleberg County, Kingsville	1
Lago Vista - Rusty Allen	1
Maverick County Memorial International, Eagle Pass	1
Palacios Municipal	1
Perryton Ochiltree County	1
Pineland Municipal	1
Sonora Municipal	1
Tradewind, Amarillo	1
Victoria Regional	1
Wharton Regional	1
Winnsboro Municipal	1
Zapata County	1

TABLE 45
Airports with Unacceptable or Unavailable Flight Planning Room

Airport Name	Number Reported
Dallas-Fort Worth International	3
Coleman Municipal	2
Del Rio International	2
Georgetown Municipal	2
Brooks County, Falfurrias	1
Cameron Municipal Airpark	1
Cherokee County, Jacksonville	1
Clifton Municipal	1
Cotulla-La Salle Co	1
Denton Municipal	1
Duval-Freer	1
Grayson County, Sherman/Denison	1
Harrison County, Marshall	1
Houston County, Crockett	1
Kickapoo Downtown Airpark, Wichita Falls	1
Lago Vista - Rusty Allen	1
Maverick County Memorial International, Eagle Pass	1
Palacios Municipal	1
Pineland Municipal	1
Sonora Municipal	1
Tradewind, Amarillo	1
Winnsboro Municipal	1
Zapata County	1

TABLE 46
Airports with Unacceptable or Unavailable Weather Information

Airport Name	Number Reported
Brooks County, Falfurrias	2
Dallas-Fort Worth International	2
Del Rio International	2
Cameron Municipal Airpark	1
Clifton Municipal	1
Coleman Municipal	1
Denton Municipal	1
Duval-Freer	1
Grayson County, Sherman/Denison	1
Houston County, Crockett	1
Kickapoo Downtown Airpark, Wichita Falls	1
Maverick County Memorial International, Eagle Pass	1
Mt. Pleasant Municipal	1
Pineland Municipal	1
Sonora Municipal	1
Tradewind, Amarillo	1

It is worth noting that the airports mentioned in the preceding tables represent a small minority of airports where comments were made about their facilities and services. Mention is made here not to single-out any airport but simply to indicate that a business aircraft operator who uses the airport believes that improvements can be made to improve business activity at the airport.

The survey also sought information about instrument approaches at airports in Texas. Specifically, users were asked where instrument approaches were frequently required and whether or not the existing approach was adequate. Table 47 presents the results of the survey.

TABLE 47
Airports Frequently Requiring Instrument Approaches

Airport Name	Number Reported
Houston George Bush Intercontinental	71
Dallas Love Field	70
San Antonio International	30
Austin-Bergstrom International	29
Houston George Bush Intercontinental	20
Addison, Dallas	11
Fort Worth Meacham	11
Dallas-Fort Worth International	10
Amarillo International	6
Midland International	6
Scholes Field, Galveston	6
Sugar Land Municipal/Hull Field	6
Waco Regional	6
Easterwood Field, College Station	5
Gregg County, Longview	5
Lubbock International	5
Tyler Pounds Field	5
David Wayne Hooks Memorial, Houston	4
Laredo International	4
Montgomery County, Conroe	4
West Houston	4
Abilene Regional	3
Brownsville/South Padre Island International	3
Denton Municipal	3
McGregor Executive, Waco	3
Angelina County, Lufkin	2
Aransas County, Rockport	2
Brooks County, Falfurrias	2
Corpus Christi International	2
Cotulla-La Salle County	2
Georgetown Municipal	2
McKinney Municipal	2
Mt. Pleasant Municipal	2
Redbird, Dallas	2
Rio Grande Valley International, Harlingen	2
Sheppard AFB/Wichita Falls Municipal	2
Southeast Texas Regional, Beaumont/Port Arthur	2
Stinson Municipal, San Antonio	2
A.L. Mangham Jr. Regional, Nacogdoches	1
Alpine-Casparis Municipal	1
Arlington Municipal	1
Bay City Municipal	1
Beaumont Municipal	1

Airport Name	Number Reported
Beeville Municipal	1
Brenham Municipal	1
Cameron Municipal	1
Clark Field Municipal, Stephenville	1
Duval-Freer	1
Eagle Pass Municipal	1
Eastland Municipal	1
Ellington Field, Houston	1
Fort Worth Spinks Oak Grove Heliport	1
Fort Worth Alliance	1
Gainesville Municipal	1
Garner Field, Uvalde	1
Gillespie County, Fredericksburg	1
Harrison County, Marshall	1
Hereford Municipal	1
Horseshoe Bay	1
Houston Gulf	1
Kickapoo Downtown Airpark, Wichita Falls	1
Killeen Municipal	1
Kleberg County, Kingsville	1
Lago Vista - Rusty Allen	1
Lampasas Municipal	1
Maverick County Memorial International, Eagle Pass	1
McAllen Miller International	1
McKinley Field, Pearsall	1
Midland Airpark	1
Mineral Wells Municipal	1
Mustang Beach, Port Aransas	1
New Braunfels Municipal	1
Ozona Municipal	1
Palacios Municipal	1
Panola County – Sharpe Field, Carthage	1
Pecos Municipal	1
Perryton Ochiltree County	1
Rockwall Municipal	1
San Angelo Regiona – Mathis Field	1
Sonora Municipal	1
Sulphur Springs Municipal	1
Texarkana Regional Webb Field	1
Victoria Regional	1
Wharton Regional	1
Winston Field, Snyder	1

Table 48 lists the airports that frequently require instrument approaches where respondents have articulated that the approaches are not adequate.

TABLE 48
Airports with Inadequate Instrument Approaches

Airport Name	Number Reported
Mt. Pleasant Municipal	2
West Houston	2
Alpine-Casparis Municipal	1
Aransas County, Rockport	1
Arlington Municipal	1
Bay City Municipal	1
Beaumont Municipal	1
Beeville Municipal	1
Brenham Municipal	1
Brooks County, Falfurrias	1
Cameron Municipal	1
Cotulla-La Salle County	1
David Wayne Hooks Memorial, Houston	1
Duval-Freer	1
Eagle Pass Municipal	1
Eastland Municipal	1
Gainesville Municipal	1
Garner Field, Uvalde	1
Georgetown Municipal	1
Harrison County, Marshall	1
Horseshoe Bay	1
Houston Gulf	1
Maverick County Memorial International, Eagle Pass	1
McGregor Executive, Waco	1
Mineral Wells Municipal	1
Mustang Beach, Port Aransas	1
Ozona Municipal	1
Panola County-Sharpe Field, Carthage	1
Rockwall Municipal	1
Sonora Municipal	1
Stinson Municipal, San Antonio	1
Sugar Land Municipal/Hull Field	1
Winston Field, Snyder	1

Figure 15 shows both the preferences and requirements of the respondents with respect to available instrument approaches. The minimum instrument approach preferred by respondents is the NDB approach (46%) while the preferred instrument approach is the ILS (67%). The remaining preferences and requirements are shown in the figure.

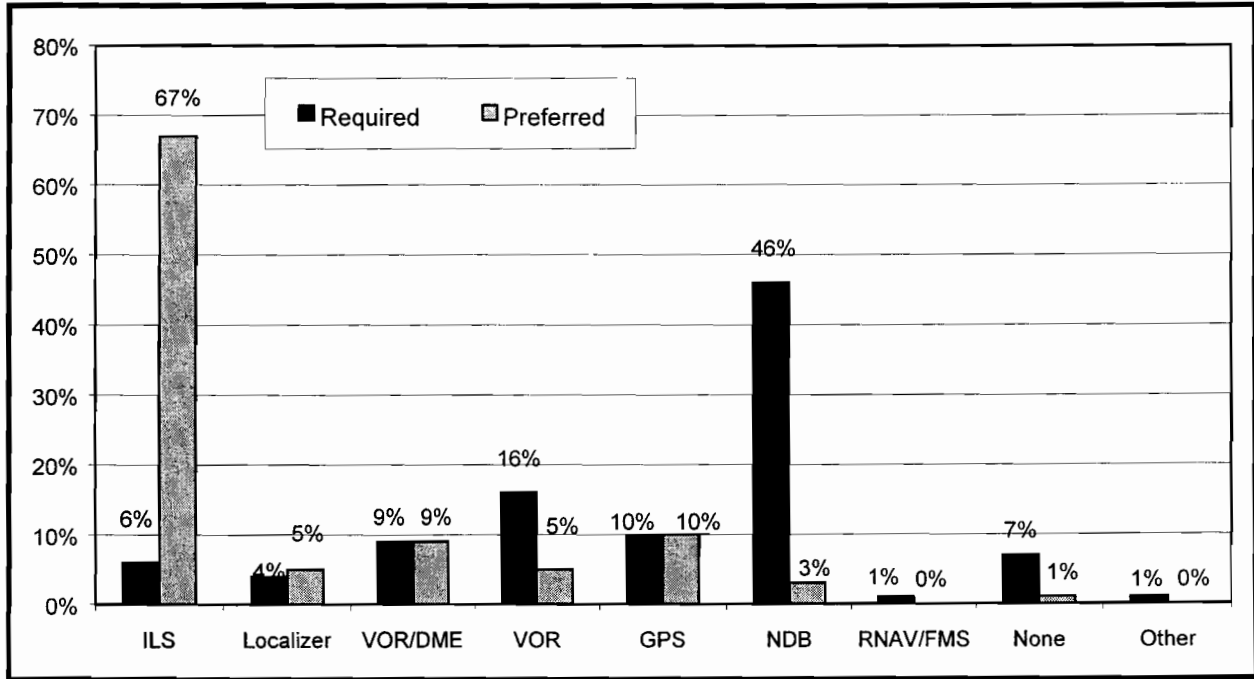


FIGURE 15. Instrument Approach Requirements and Preferences

Business aircraft users were also asked about visual aid preferences. Respondents were asked to choose between VASI/PAPI and PLASI and between tetrahedrons or windsocks. These preferences are shown in Figure 16. The vast majority of business aircraft users preferred VASI/PAPIs over PLASIs. Windsocks were favored over tetrahedrons.

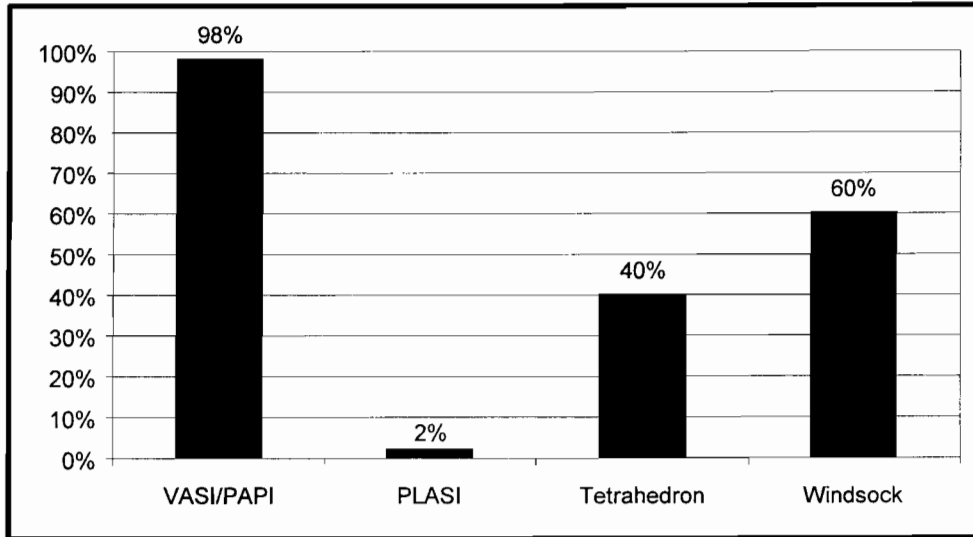


FIGURE 16. Visual Aid Preferences

Runway lighting requirements were also surveyed. When asked their minimum runway lighting needs, 62% responded with medium intensity runway lighting. These results are summarized in Table 49. The remaining preferences were just about evenly split between high and low intensity lighting systems.

TABLE 49
Minimum Runway Lighting Needs

Type of Runway Lighting	Percent
High Intensity	18%
Medium Intensity	62%
Low Intensity	20%
Total	100%

Weather Systems and Information

The collection and dissemination of weather information and data for pilots has improved dramatically over the years. The following section documents where business aircraft users get their information, how useful some of the current information is, and the overall adequacy of weather information at general aviation terminals. Figure 17 shows where business aircraft users get their weather information. Respondents were given a list to choose from as well as an opportunity to add their own sources. Percentages will not add to 100% as they were asked to check all the sources that apply.

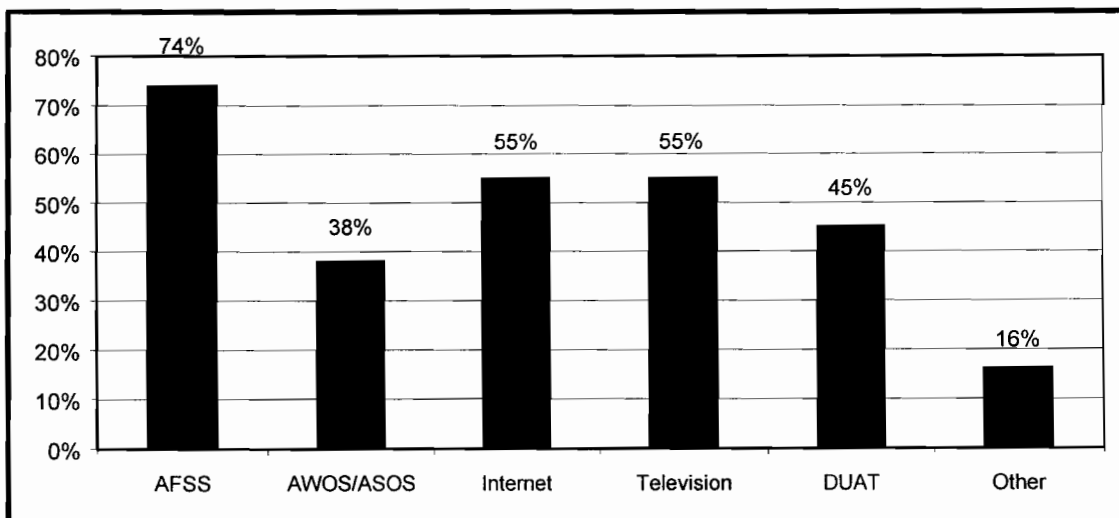


FIGURE 17. Sources of Weather Information Prior to Flight

Approximately 55% of the respondents indicated that they receive weather information from the Internet. Table 50 lists the Internet sites reported on the survey along with the number of times they were reported.

TABLE 50
Weather-Related Internet Sites

Internet Site	Number Reported
www.weather.com	27
www.aopa.org	25
www.intellicast.com	18
www.duat.com (DTC)	6
www.wsicorp.com	5
www1.duats.com (GTE)	5
adds.awc-kc.noaa.gov	4
www.weatherconcepts.com	4
www.weathertap.com	4
www.wx.com	4
www.accuweather.com	3
www.aol.com	3
www.noaa.gov	2
www.univ-wea.com/univwx/weather.htm	2
www.yahoo.com	2
www.cnn.com	1
www.khou.com	1
www.msnbc.com	1
www.nws.noaa.gov	1
www.theweathernetwork.com	1
www.uvdatacenter.com	1

When asked how useful the weather briefing stations located in the general aviation terminals were, 95% indicated that they were at least moderately useful. Approximately 69% found the stations very useful, 26% found them moderately useful, and 4% did not use them. Finally, when asked if the weather information services at the Texas airports were adequate, 79% indicate they were adequate. Approximately 13% said they were not and 7% did not know. Overall, the weather information services appear to be adequate. Of the 13% that indicated the weather information services were inadequate, several made comments. These comments are listed in Table 51.

TABLE 51
Comments on Inadequate Weather Services at Texas Airports

Comments
Most small airports do not have weather information services available. Some don't even have telephones.
Panola County needs AWOS/ASOS
Jim Hogg County (HBV) - AWOS
No weather available at Eastland Municipal (ETN).
Lubbock Town & Country (F82) has none.
Sonora Municipal (E29), Brooks County (T18)
Wichita Falls-Kickapoo Downtown Airpark (T47) needs a weather briefing station.
Mt. Pleasant; Alt setting during approach
Jim Hogg County (HBV)-WSI; Hereford Municipal (HRX)-WSI
Too many providers, some are no good, many sites don't have maps and important flight information.
More airports need AWOS, 3 or more.
Flight service has been cut back too much, briefers are great they are overworked.
Need more AWOS/ASOS.
Put in more equipment.
Ochiltree County
Ft. Stockton-Pecos County
Gainsville Municipal needs and ASOS or an ATIS.
Houston County-Crocket and Pineland-phones, weather display, pilot briefing room.
Comanche County-City (7F9)
Have airports install a WSI pilot brief vector machine.
I would like a weather radar screen at all airports that we use.
Weather central is not as good as it was.

FUTURE PLANS

While developing an understanding of the current needs of business aircraft users is important, it is also equally important to have an idea about the direction these users are heading in terms of the types of equipment they'll be using and the types of facilities and services they will need. This was one of the objectives of the survey.

When asked about future plans of their businesses, the majority of the respondents indicated that they plan to upgrade the type of aircraft in their fleet (57%). Figure 18 illustrates the future direction and plans of these business aircraft users. Respondents were asked to select all that apply so numbers will not total 100%.

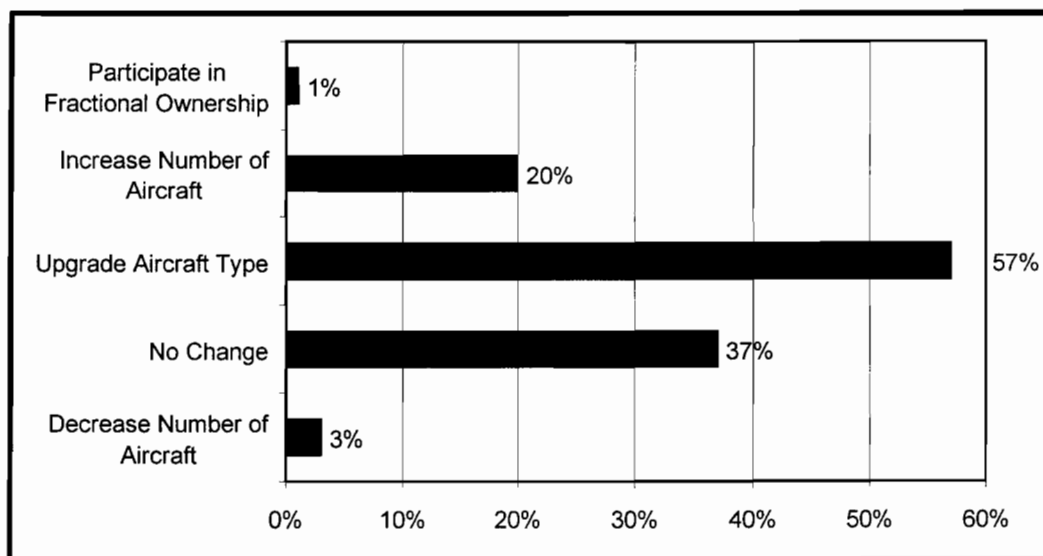


FIGURE 18. Fleet Outlook (Next Five Years)

Nearly 40% of those indicating that they would be increasing or upgrading their fleets said that their new aircraft would be more demanding on airport services and facilities. Table 52 lists the needs/requirements of these additions/upgrades. Some of the comments are duplicated but are done so to illustrate the frequency of the responses. These are unedited original responses so a good sense of the needs and future requirements can be developed.

TABLE 52
Projected Needs/Requirements

Comments
4,000 runway length
5,000' runways
5,000' long
5,000+/75
5,000x100 ft runway
6,000'-100' w
95,000lbs, 100' length 100' wide, large hanger
Airports handling of 45,000-50,000 LBS jet, 5500' of runway
An increase runway length is needed
An improved general aviation-hangar facility
At Pineland more parking space
Be able to support heavy weight
Better hangar facilities
Current facilities will meet minimum requirements
E15 needs an additional 800' to bring it up to 5,000' which is considered minimum for turbojet use.
Full service airport close to office in Houston
Hanger space
Heavy load bearing
I need 6,000 in Eastland (ETN) and more weight bearing capacity
Increase apron/hangar space
Jet fuel will be needed
King air will require more than 3,000' and jet fuel
King air 90 heavier, bigger hanger, Jet A

Comments
Larger aircraft - more apron/hanger space
Longer runway
Longer runway
Longer runways
Longer runways
Longer runways
Longer runways
Longer runways
Longer runways for jet use
Longer runways, approach lighting
Longer runways at New Braunfels (BAZ)
Longer runways hanger space
Longer wider runways
Longer, more space
Longer, wider, stronger runway
More hangar space
More space at Mustang Beach-Port Aransas (2R8) for wing span
More apron and stronger taxiways
Move up to Lear 35
Need 5,000 ft
Possible lower runways
Possibly longer runway than 3,000'
Runway length 4,000+
Runway and approach aids suitable for jet and propjet operations
Runway length
Runway
Service; Approaches

As stated earlier in the report, the demand for business aircraft remains robust and the outlook is strong. The data collected in this survey appears to agree with that assessment. Approximately 37% expect their fleet to remain the same size over the next five years. Over the same time period, 57% expect to upgrade the type of aircraft in their fleet and 20% expect to increase the size of their fleet. Nearly 40% of those upgrading or increasing their fleet expect their new aircraft to be more demanding (larger/faster) on the airports they use.

OVERALL SYSTEM

The Texas Airport System is comprised of approximately 300 airports varying in size, function, role, and level of service. Such a large and diverse system may pose difficulties and challenges in meeting the needs of its users but its ability to serve the business community has been quite good. In two final assessments, the business aircraft users were asked to provide their overall thoughts on the access and condition of airports in the state. Figure 19 shows the responses to how business aircraft users rated the condition of airports in Texas. More than 90% found them to be excellent or good while none found them to be poor. Figure 20 shows the ratings of access to Texas' airports. Again, more than 90% found access to be excellent or good, 8% found it to be fair, and none found it to be poor.

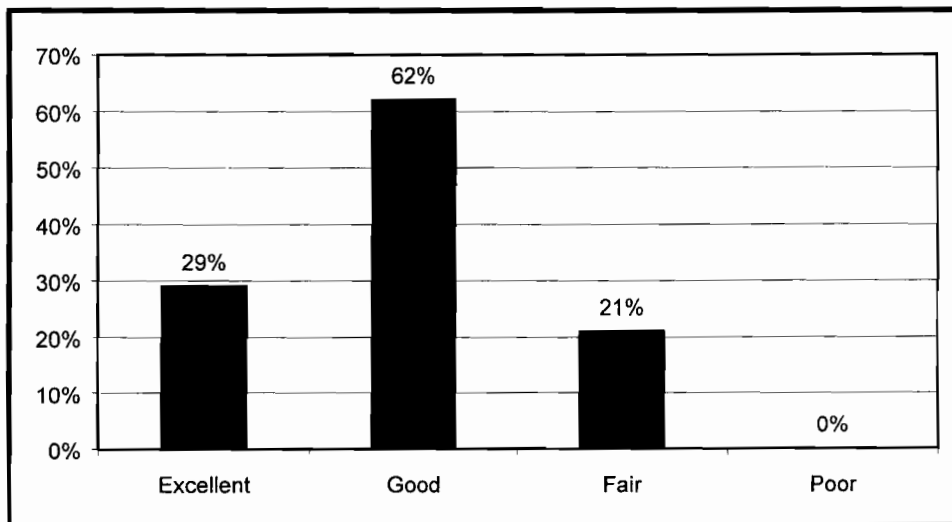


FIGURE 19. Texas Airport Conditions

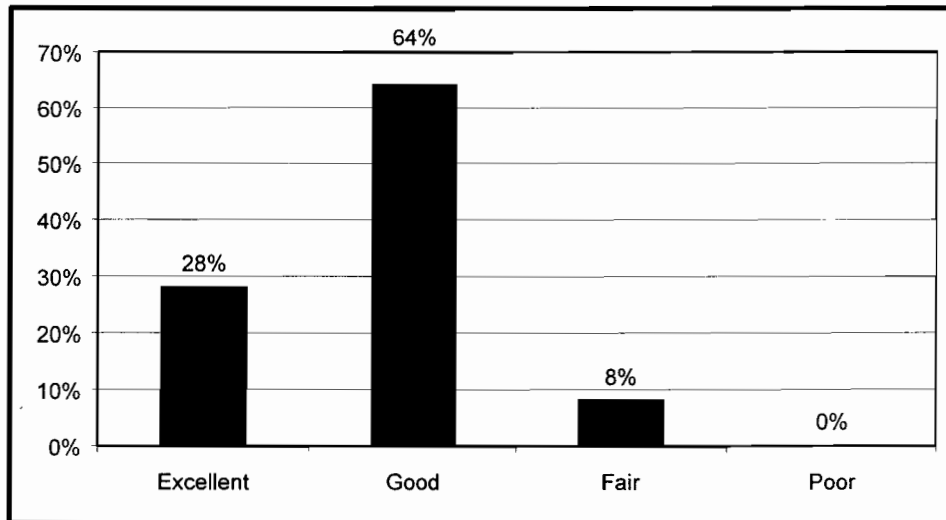


FIGURE 20. Access to Texas Airports

It is worth noting that no respondents rated the overall condition or the overall access to airports in the Texas system as poor. And, more than 90% rated the airports as good or better. These positive numbers are quite good. Airports in Texas are doing a very good job of meeting the needs of the business community that use their facilities and services. These survey results point that out as well as highlight some locations, facilities, and services that could use some improvement to better serve these specialized customers. The data suggest that the business users are still using facilities despite their comments regarding improvements. No abandonment has occurred. Nevertheless, improvements can be used to maintain current users and customers as well as attract more in the future.

GENERAL COMMENTS

The section that follows is a compilation of the general comments by the respondents. The comments touch on a variety of topics and are listed below in their unedited form.

- We go to a lot of small airports because they are close to the job site. Some like Pineland, TX do not have any facilities, not even a phone! The others like LFK are very good.
- Open/reopen GA reliever in Austin, I recognize muni-based politics re: Mueller closure, but, let's do what's right.. We need a GA reliever/alternative to Bergstrom. 2) Fix air space problems in/out of EFD. Hobby firmly controls access to airspace. Tell Southwest Airlines to "lighten up". We need to make EFD easier to fly westbound or approach from west.
- Texas has an excellent airport system. While there is always room for improvement, overall Texas is in a very good position for continued growth in aviation.

- Through out Texas the airport system is fairly good, compared to some states, we have an excellent network of airports, the small rural airports need assistance in getting weather nets that are provided by the state.
- I need to use TxDOT specs in construction rather than FAA specs.
- Gen Aviation access/services at AUS fall far below the standards for services and facilities at the old Municipal.
- Lack of economical hangar space is biggest problem in TX.
- Austin is not convenient-Dell computer took our North airport executive, Mueller would make a fine 6A airport.
- Very upset that Austin Mueller closed without regard to the impact on business aircraft owners. Will probably be moving base to OK for this and other reasons.
- Shortage of Gen Aviation airports in Houston area.
- Perryton is about to undergo renovations, and it would be a perfect time to upgrade the instrument approach.
- Lytle is in need of an airport which will accommodate single engineering, twin engines, business jets and helicopters.
- Short like is prohibiting our capabilities. We may be forced to build a private strip to accommodate our needs.
- Keep up the good work! I wish all states were concerned about GA as you are!
- Eagle Pass rapidly growing business community. Lacks severely in airport weather reporting and instrument approaches, rental car, taxi.
- Small communities need help; Belville trees need to be trimmed; Austin needs a GA airport on the north side within a 15 min drive.
- Austin Mueller needs to be reopened for GA.
- We need more central business heliports. Houston does not have a public access heliport and Austin could use one also.
- Texas has a good GA facility. The need for ground radar display at most terminals would be good.

- Airport in TX very good, but concerned about closures.
- Delay time in and out of IAH is excessive.
- Thanks for help with improvements at Fort Worth Sphinx airport.
- Time to spend money on smaller airports, open the Frisco airport, state needs to fix problems there, airport is needed.
- Need to do something with FAA to make GA more workable.
- Need more GPS, AWOS-ASOS, more airports with longer runways (5000' by 100')
- Survey too long.
- Austin is most undesirable airport we use in the US.
- Flying GA is the way to go. It is good for state runways, instrumental approaches and weather info should be advanced as new things come up.
- Eagle Pass is excellent, would have more travelers if had GPS approach.
- I am glad to see some kind of survey is being taken, however I certainly hope to see some results.
- Need better instrument approach at GTU.
- As a general rule Texas airports and related services are excellent, the only complaint I have is at HRL. The GA FBO is on the back side of the airport. When you arrive you have to call a taxi to get to the rental car and same at departure.
- This aircraft seems to be addressing only fixed wing aircraft.
- AUS is good airport but hard to drive to with current road conditions, customs is only during day hours.
- I really miss the TX airport directory. This is a very useful book for type of flying.
- TX has good airports!
- We don't meet the need for smaller airports.
- Look into the downtown public heliport that has been under debate.

- All airports should have 1) WX computer 2) AVGAS and jet 3) instrument approach 4) contact FSS on ground 5) 24-hour service 6) courtesy car 7) pilot lounge.
- Please keep funds from the FDA trust fund available for airport, airspace improvements.
- TX airports as a whole are better than in other states.
- Please put a public use helipad in downtown Austin or off I-35.

CHAPTER 5. CONCLUSIONS AND RECOMMENDATIONS

The data gathered as part of the survey of business aircraft users in Texas provides a wealth of information that can be used in the planning and programming process. With input from 236 business aircraft users that operate 333 business aircraft, the assembled data provides great insight into the needs and practices of the business aviation community. It also provides a glimpse as to future direction of these operators in terms of the types of aircraft they use and the level of activity they expect to see.

CONCLUSION

The strengths and weaknesses of the airport system are shown in the data. Clearly and convincingly, the strengths are numerous. Limitations and weaknesses, though present, are minimally indicated. The intention is not to single out any particular airport mentioned in the survey but rather to point out its strengths and weaknesses. These are to serve as examples for other airports attempting to attract business aircraft to their facility. The early sections of the results articulate what some of the needs are for business aircraft users operating different types of aircraft. These needs are good goals as a first step to attract businesses.

Though some of the runway length requirements are less than 5,000-feet long, a general consensus still exists among airport operators and the business aviation community that 5,000 feet is a minimum. For smaller airports seeking to attract more activity, they should understand that the difference between 4,000 and 5,000 feet runways might be the difference between business aircraft just using the airport and users basing their aircraft at the airport. While many of the aircraft reported in this survey require far less than 5,000 feet, airports will generally be limited in the types of business aircraft that they can accommodate. This will be especially true in the future as business aircraft become larger and require more space. In addition, this may limit revenue potential, as larger aircraft require more fuel, larger hangars, and more expensive maintenance. These factors all play into the return-on-investment analysis when considering that airport development and expansion costs can enhance revenue potential.

The results of this survey highlight many important issues in airport system planning that reach beyond business aviation. These results illustrate the needs of one of general aviation's largest and most profitable elements. It does so with respect to infrastructure requirements and services. It also points out deficiencies in both facilities and services that, when corrected, can be used to attract business as well as other aviation activity. The information on the types of businesses that operate aircraft can be used by economic development agencies when considering what types of businesses to attract to the community and region.

Information concerning locations is also quite useful. Not only were the most frequented facilities identified but locations that either need better facilities or need an airport were also identified. Business aviation also uses private airports, and these locations and reasons for their use were noted. This provides some additional insight into why private airports are used and the role they play in our regional and state airport system. Finally, the data collected includes information on weather services and sources. A list of the services and sources used are included in the results as well as a list of frequently used weather sources on the Internet.

Much of the data gathered from this survey can be used to the benefit of many others. Economic development officials can gain insights into what is needed to attract businesses as well as the types of businesses that use airport facilities. Pilots can benefit from increased weather information services and resources, and airports can become better informed as to what improvements can lead to attracting higher levels of aircraft activity and based aircraft. All of these features point toward greater self-sufficiency, which is a difficult goal to achieve for many airports.

RECOMMENDATIONS

The survey results have the potential to impact the state in many ways if not for the problems typically associated with funding the airport system. Airport development needs in the state currently exceed the available resources. Much of the needed development costs will just bring some airports up to standards and only maintaining others. But these costs should not be viewed without the corresponding benefits, which directly and indirectly impact the state in excess of the costs. This survey provides a blueprint or guideline for developing an airport capable of meeting the needs of the business aviation community. This community includes small companies as well as some of the largest, multi-national companies in the world. While these needs may be understood by some in the aviation community, they may not be apparent to others. This is where the significance of this report can be directed.

The research teams makes the following recommendations regarding the business aircraft user's survey results:

- The results should be made available to airports seeking funds for airport development. This highlights the types of facilities and services that attract aircraft and potentially enhance revenue.
- The planning and programming process should focus on the respondent needs so as to show responsiveness to the users of the system. Although these are specific to business users, these users are among the most sophisticated general aviation users and the needs of other general aviation users are likely to be met in the process.
- Consideration should be given to the function and role of an airport when considering development to meet the needs of business aircraft users. This includes the current and future role and service levels. Some airports are more clear candidates for such development. Many agricultural and remote airports, among others, may not be appropriate for development to business aircraft "standards" because of their limited role and function (due to size/space limitations and/or other nearby airports serving the need).
- The report should be made available to economic development officials who are in the business of attracting businesses to their community or region. This can help in generating support for needed airport improvements within the community. Citizen

participation is a very important part of the process and an early and clear understanding of the issues can help the process.

- Consideration should be given to the establishment of a business aviation functional classification for airports. Such a designation can help in raising the priority level of certain projects that are likely to increase activity and based aircraft levels. Such an outcome creates a better opportunity for airports to generate revenue and become more self-sufficient thus requiring less outside money in the future and increasing the tax base of the local community. The data collected is more than sufficient to provide a basis or foundation for such a functional category. Consideration can also be given to the specific projects that attract the additional activity in lieu of such a functional category. Such projects can be generated from the data as well.

These recommendations are comprised of two general notions. The first is the dissemination of the information so that it can be used to by airport and economic development officials as a blueprint or guideline for attracting businesses to the community and activity to the airport. This should enhance the ability of the airport to sustain itself as well as to increase the tax base of the community by utilizing the airport more efficiently. The second highlights the needs and requirements of an important segment of general aviation that must be considered in the planning and programming process. While much consideration is given to airports and their projects in this process, business aviation needs may not be considered as a separate class.

It should be noted that even if this is the case, many of the projects funded from year to year meet many of the needs of the business community even though they are not considered in the same context. But such consideration would not only meet the need of this specialized community but would also, by default, meet the needs of other general aviation users as their needs tend to be more pedestrian and less demanding. By doing so, the airport would achieve the same goal and it may be in a better position to enhance its revenue potential, attract new tenants and users, and perhaps most importantly, bring new companies to the region meaning an increased tax base with more employment.

With great consideration already given to the expenditure of limited resources in the airport planning and programming process, the survey results can be used to reach much farther. In addition to providing more focus to capital projects for aviation professionals, it can also be used as a tool to communicate the needs of the airport to municipal and economic development officials interested in attracting new business and more efficiently and effectively utilizing the airport (revenue potential). They can also use the survey to communicate the benefits of an improved facility to the general public. Understanding the benefits of an airport and the role it can play in the local, regional, and state economy, often makes airport development less ominous.

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APPENDIX A

General Aviation Aircraft Categorized by Airport Reference Code

1. Service Level - General Aviation

Role - Basic Utility

Applicable Design Standard - Basic Utility Stage I, ARC A-I, small aircraft

Aerospatiale TB10 Tobago
Aerospatiale TB20 Trinidad
Aerospatiale TB360 Tangara
Air Tractor 401B
Air Tractor 402A/B
Air Tractor 502A/B
Air Tractor 602
Air Tractor 802/802A
Ayres 400 Turbo Thrush
Ayres 510 Turbo Thrush
Ayres 660 Turbo Thrush
Bellanca Viking 17-30A
Cessna 150/152
Cessna 172 Skyhawk
Cessna 177 Cardinal
Cessna 180/185 Skywagon
Cessna 182 Skylane
Cessna 206 Stationair
Cessna 210 Centurion
Cessna 337 Skymaster
Gulfstream American Lynx
Gulfstream American Cheetah
Mooney Allegro
Mooney Bravo
Mooney Eagle
Mooney Encore
Mooney Ovation
North American Rockwell Commander 111, 112, 114
Piper PA-20 Pacer
Piper PA-22 Tri-Pacer
Piper PA-24 Comanche
Piper PA-28-161 Warrior 3
Piper PA-28-181 Archer 3
Piper PA-28R-201 Arrow
Piper PA-32R-301 Saratoga
Piper PA-34-220T Seneca 5
Piper PA-44-180 Seminole
Piper PA-46-350P Malibu Mirage
Raytheon Beech Bonanza A36
Raytheon Beach Bonanza B36TC
Raytheon Beach Bonanza F33A

Raytheon Beach Bonanza V35B
Raytheon Beach Baron B55/E55
Raytheon Beech Duchess 76

2. Service Level – General Aviation

Role - Basic Utility

Design Standard - Basic Utility Stage II, ARC B-I, small aircraft

Cessna 402
Cessna 404 Titan
Cessna 414 Chancellor
Cessna 421 Golden Eagle
Embraer 121 Xingu
Gulfstream Cougar GA-7
Piper Cheyenne III-A
Piper 400LS Cheyenne
Piper 31-310 Navaho
Piper 60-602P Aerostar
Raytheon Beach Baron 58, 58P, 58TC
Raytheon Beech Duke B60

3. Service Level - General Aviation; Reliever

Role - General Utility

Design Standard - General Utility Stage I, ARC A-II and B-II, small aircraft, less than 10 passenger seats

Cessna 441 Conquest
Cessna 206B Super Cargo Master
Cessna CitationJet
Commander 560
Fairchild Merlin III
Raytheon Beech E18S
Raytheon Beech King Air C90B
Raytheon Beech King Air B200

General Utility Stage I, ARC A-I, A-II, B-I, and B-II, small aircraft, 10 or more passenger seats

Cessna 208 Caravan 675
Cessna 208B Grand Caravan
Cessna 421
De Havilland Twin Otter
Embraer 120
Fairchild Merlin IV
Fairchild Metro Executive
Mitsubishi MU-2
Raytheon Beech Airliner C99

Raytheon Beech King Air BE-200
Raytheon Beech King Air BE-300LW

4. Service Level - General Utility

Role - General Utility

Design Standard: General Utility Stage II, ARC B-I and B-II, large aircraft, greater than 12,500 pounds and less than 30,000 pounds

Bombardier Learjet 28
Bombardier Learjet 29
Bombardier Learjet 31A
British Aerospace Jetstream 31
Cessna Citation 7
Cessna Bravo
Cessna Excel
Cessna Ultra
Dassault Aviation Falcon 10
Embraer-110 Bandeirante
Fairchild Aerospace Merlin 4C
Israel Aircraft Industries Astra SP, SPX
Mitsubishi Diamond MU-300
Piaggio PD-808
Raytheon Beech 1900D Airliner
Raytheon Beech Jet BE 400 A
Raytheon Beech King Air 350
Raytheon Beech Starship BE 2000
Raytheon Aircraft Co. Hawker 800XP
Sabreliner Corp. Sabreliner 40, 60, 65
Shorts 330
Shorts 360

General Utility Stage II, ARC B-II, large aircraft, greater than 30,000 pounds and less than 60,000 pounds

Bombardier (de Havilland) Dash 8Q-200, Dash 8Q-300
Cessna Citation 10
Dassault Aviation Falcon 20, 50
Dassault Falcon 200
Dassault Aviation Falcon 900C, 900EX
Dassault Aviation Falcon 2000
Fokker F-27-500

5. Service Level - General Aviation

Role - Transport

Design Standard: Transport, ARC C-II or C-III, aircraft less than 60,000 pounds

Bombardier Canadair SE

Bombardier Challenger 600W, 601-IA, 601-3A, 601-3R, 604

Bombardier Corporate Jetliner

Bombardier Learjet 35A, 45, 60

Dassault Aviation Falcon 50EX

Dassault Aviation Falcon 900B

Fairchild Aerospace Envoy 3

Fokker F-28-3000, F28-4000

Israel Aircraft Industries Galaxy

Raytheon Aircraft Co. Beechjet 400A

Raytheon Aircraft Co. Hawker Horizon

Sabreliner Corp. Sabreliner 80.

APPENDIX B

Airports by Functional Class

AIRPORT NAME	CITY	FUNCTIONAL CATEGORY
Abilene Regional	Abilene	COMMERCIAL
Amarillo International	Amarillo	COMMERCIAL
Austin-Bergstrom International	Austin	COMMERCIAL
Brownsville/South Padre Island International	Brownsville	COMMERCIAL
Houston George Bush Intercontinental	Houston	COMMERCIAL
Corpus Christi International	Corpus Christi	COMMERCIAL
Dallas Love Field	Dallas	COMMERCIAL
Dallas-Fort Worth International	Dallas-Fort Worth	COMMERCIAL
Easterwood Field	College Station	COMMERCIAL
El Paso International	El Paso	COMMERCIAL
Ellington Field	Houston	COMMERCIAL
Gregg County	Longview	COMMERCIAL
Jefferson County	Beaumont/Port Arthur	COMMERCIAL
Killeen Municipal	Killeen	COMMERCIAL
Laredo International	Laredo	COMMERCIAL
Lubbock International	Lubbock	COMMERCIAL
Mathis Field	San Angelo	COMMERCIAL
McAllen Miller International	McAllen	COMMERCIAL
Midland International	Midland	COMMERCIAL
Rio Grande Valley International	Harlingen	COMMERCIAL
San Antonio International	San Antonio	COMMERCIAL
Sheppard AFB/Wichita Falls Municipal	Wichita Falls	COMMERCIAL
Texarkana Regional-Webb Field	Texarkana	COMMERCIAL
Tyler Pounds Field	Tyler	COMMERCIAL
Victoria Regional	Victoria	COMMERCIAL
Waco Regional	Waco	COMMERCIAL
William P. Hobby	Houston	COMMERCIAL
Addison	Dallas	RELIEVER
Arlington Municipal	Arlington	RELIEVER
Austin/Waller County (New)	Austin/Waller	RELIEVER
Brazoria County	Angleton/Jackson	RELIEVER
Clover Field	Houston	RELIEVER
David Wayne Hooks Memorial	Houston	RELIEVER
Denton Municipal	Denton	RELIEVER
Fort Worth Alliance	Fort Worth	RELIEVER
Fort Worth Meacham International	Fort Worth	RELIEVER
Fort Worth Spinks	Fort Worth	RELIEVER
Georgetown Municipal	Georgetown	RELIEVER
Grand Prairie Municipal	Grand Prairie	RELIEVER
Greater Austin-Pflugerville (New)	Pflugerville	RELIEVER
La Porte Municipal	La Porte	RELIEVER
Lancaster Municipal	Lancaster	RELIEVER
McKinney Municipal	McKinney	RELIEVER
Mesquite Metro	Mesquite	RELIEVER

AIRPORT NAME	CITY	FUNCTIONAL CATEGORY
Montgomery County	Conroe	RELIEVER
Redbird	Dallas	RELIEVER
San Marcos Municipal	San Marcos	RELIEVER
Stinson Municipal	San Antonio	RELIEVER
Sugar Land Municipal/Hull Field	Houston	RELIEVER
West Houston	Houston	RELIEVER
A. L. Mangham Jr. Regional	Nacogdoches	REGIONAL
Alice International	Alice	REGIONAL
Alpine-Casparis Municipal	Alpine	REGIONAL
Angelina County	Lufkin	REGIONAL
Aransas County	Rockport	REGIONAL
Avenger Field	Sweetwater	REGIONAL
Bay City Municipal	Bay City	REGIONAL
Brownwood Regional	Brownwood	REGIONAL
Burnet Municipal Kate Craddock Field	Burnet	REGIONAL
C. David Campbell Municipal	Corsicana	REGIONAL
Cleburne Municipal	Cleburne	REGIONAL
Cox Field	Paris	REGIONAL
Dalhart Municipal	Dalhart	REGIONAL
Del Rio International	Del Rio	REGIONAL
Draughon-Miller Municipal	Temple	REGIONAL
Maverick County Memorial International	Eagle Pass	REGIONAL
Fort Stockton-Pecos County	Fort Stockton	REGIONAL
Garner Field	Uvalde	REGIONAL
Graham Municipal	Graham	REGIONAL
Hale County	Plainview	REGIONAL
Harrison County	Marshall	REGIONAL
Hereford Municipal	Hereford	REGIONAL
Huntsville Municipal	Huntsville	REGIONAL
Hutchinson County	Borger	REGIONAL
Jasper County-Bell Field	Jasper	REGIONAL
Kerrville Municipal/Louis Schreiner Field	Kerrville	REGIONAL
Kimble County	Junction	REGIONAL
Kleberg County	Kingsville	REGIONAL
Levelland Municipal	Levelland	REGIONAL
McMahon-Wrinkle	Big Spring	REGIONAL
Midland Airpark	Midland	REGIONAL
Moore County	Dumas	REGIONAL
Mt. Pleasant Municipal (New)	Mt. Pleasant	REGIONAL
New Braunfels Municipal	New Braunfels	REGIONAL
Ozona Municipal	Ozona	REGIONAL
Perry Lefors Field	Pampa	REGIONAL
Schlemeyer Field	Odessa	REGIONAL
Scholes Field	Galveston	REGIONAL

AIRPORT NAME	CITY	FUNCTIONAL CATEGORY
Stephens County	Breckenridge	REGIONAL
Wharton Municipal	Wharton	REGIONAL
Wilbarger County	Vernon	REGIONAL
Winston Field	Snyder	REGIONAL
Grayson County	Sherman/Denison	INDUSTRIAL
Hondo Municipal	Hondo	INDUSTRIAL
Majors Field Municipal	Greenville	INDUSTRIAL
Mineral Wells	Mineral Wells	INDUSTRIAL
TSTC Waco	Waco	INDUSTRIAL
Andrews County	Andrews	MULTIPURPOSE
Arledge Field	Stamford	MULTIPURPOSE
Athens Municipal	Athens	MULTIPURPOSE
Atlanta Municipal	Atlanta	MULTIPURPOSE
Bandera County (New)	Bandera	MULTIPURPOSE
Beaumont Municipal	Beaumont	MULTIPURPOSE
Beeville Municipal	Beeville	MULTIPURPOSE
Bishop Municipal	Bishop	MULTIPURPOSE
Bowie Municipal	Bowie	MULTIPURPOSE
Brazoria County	Angleton/Lake Jackson	MULTIPURPOSE
Brenham Municipal	Brenham	MULTIPURPOSE
Bridgeport Municipal	Bridgeport	MULTIPURPOSE
Bruce Field	Ballinger	MULTIPURPOSE
Caddo Mills Municipal	Caddo Mills	MULTIPURPOSE
Caldwell Municipal	Caldwell	MULTIPURPOSE
Calhoun County	Port Lavaca	MULTIPURPOSE
Castroville Municipal	Castroville	MULTIPURPOSE
Center Municipal	Center	MULTIPURPOSE
Chambers County	Anahuac	MULTIPURPOSE
Cherokee County	Jacksonville	MULTIPURPOSE
Childress Municipal	Childress	MULTIPURPOSE
City of Tulia/Swisher County Municipal	Tulia	MULTIPURPOSE
Clarendon Municipal	Clarendon	MULTIPURPOSE
Clark Field Municipal	Stephenville	MULTIPURPOSE
Clarksville-Red River County	Clarksville	MULTIPURPOSE
Cleveland Municipal	Cleveland	MULTIPURPOSE
Clifton Municipal/Isenhower	Clifton	MULTIPURPOSE
Cochran County	Morton	MULTIPURPOSE
Coleman Municipal	Coleman	MULTIPURPOSE
Colorado City	Colorado City	MULTIPURPOSE
Comanche County-City	Comanche	MULTIPURPOSE
Commerce Municipal	Commerce	MULTIPURPOSE
Coulter Field	Bryan	MULTIPURPOSE
Crosbyton Municipal	Crosbyton	MULTIPURPOSE

AIRPORT NAME	CITY	FUNCTIONAL CATEGORY
Culberson County	Van Horn	MULTIPURPOSE
Curtis Field	Brady	MULTIPURPOSE
Dan E. Richards Municipal	Paducah	MULTIPURPOSE
Decatur Municipal	Decatur	MULTIPURPOSE
Denver City	Denver City	MULTIPURPOSE
Devine Municipal	Devine	MULTIPURPOSE
Eastland Municipal	Eastland	MULTIPURPOSE
Eden-Concho County (New)	Eden	MULTIPURPOSE
Edinburg International Airport	Edinburg	MULTIPURPOSE
Ennis Municipal	Ennis	MULTIPURPOSE
Fayette Regional Air Center	La Grange	MULTIPURPOSE
Floydada Municipal	Floydada	MULTIPURPOSE
Follett/Lipscomb County	Follett	MULTIPURPOSE
Franklin County	Mount Vernon	MULTIPURPOSE
Gaines County	Seminole	MULTIPURPOSE
Gainesville Municipal	Gainesville	MULTIPURPOSE
Gatesville, City-County	Gatesville	MULTIPURPOSE
Giddings-Lee County	Giddings	MULTIPURPOSE
Gillespie County	Fredericksburg	MULTIPURPOSE
Gilmer-Upshur County	Gilmer	MULTIPURPOSE
Gladewater Municipal	Gladewater	MULTIPURPOSE
Gonzales Municipal	Gonzales	MULTIPURPOSE
Granbury Municipal	Granbury	MULTIPURPOSE
Gruver Municipal	Gruver	MULTIPURPOSE
H. H. Coffield Regional	Rockdale	MULTIPURPOSE
Hallettsville Municipal	Hallettsville	MULTIPURPOSE
Hamilton Municipal	Hamilton	MULTIPURPOSE
Hawthorne Field	Kountze/Silsbee	MULTIPURPOSE
Hearne Municipal	Hearne	MULTIPURPOSE
Hemphill County	Canadian	MULTIPURPOSE
Hillsboro Municipal	Hillsboro	MULTIPURPOSE
Houston County	Crockett	MULTIPURPOSE
Houston Gulf	Houston	MULTIPURPOSE
Houston Westside (New)	Houston	MULTIPURPOSE
Houston Southwest	Houston	MULTIPURPOSE
Jackson County	Edna	MULTIPURPOSE
Jones Field	Bonham	MULTIPURPOSE
Karnes County	Kenedy	MULTIPURPOSE
Kendall County - Boerne (New)	Boerne	MULTIPURPOSE
Lampasas Municipal	Lampasas	MULTIPURPOSE
Leon County (New)	Buffalo/Centerville	MULTIPURPOSE
Liberty Municipal	Liberty	MULTIPURPOSE
Littlefield Municipal	Littlefield	MULTIPURPOSE
Live Oak County	George West	MULTIPURPOSE
Livingston Municipal	Livingston	MULTIPURPOSE

AIRPORT NAME	CITY	FUNCTIONAL CATEGORY
Llano Municipal	Llano	MULTIPURPOSE
Lockhart Municipal	Lockhart	MULTIPURPOSE
Marfa Municipal	Marfa	MULTIPURPOSE
Marian Airpark	Wellington	MULTIPURPOSE
Mason County	Mason	MULTIPURPOSE
McGregor Municipal	Waco	MULTIPURPOSE
McKinley Field	Pearsall	MULTIPURPOSE
Memphis Municipal	Memphis	MULTIPURPOSE
Menard County	Menard	MULTIPURPOSE
Mexia-Limestone County	Mexia	MULTIPURPOSE
Miami-Roberts County	Miami	MULTIPURPOSE
Mid Valley	Weslaco	MULTIPURPOSE
Midlothian/Waxahachie Municipal	Midlothian/Waxahachie	MULTIPURPOSE
Mills County (New)	Goldthwaite	MULTIPURPOSE
Mineola-Quitman	Mineola/Quitman	MULTIPURPOSE
Muleshoe Municipal	Muleshoe	MULTIPURPOSE
Navasota Municipal	Navasota	MULTIPURPOSE
Newton Municipal	Newton	MULTIPURPOSE
Nueces County	Robstown	MULTIPURPOSE
Olney Municipal	Olney	MULTIPURPOSE
Orange County	Orange	MULTIPURPOSE
Palacios Municipal	Palacios	MULTIPURPOSE
Palestine Municipal	Palestine	MULTIPURPOSE
Panhandle-Carson County	Panhandle	MULTIPURPOSE
Panola County-Sharpe Field	Carthage	MULTIPURPOSE
Pecos Municipal	Pecos	MULTIPURPOSE
Perryton Ochiltree County	Perryton	MULTIPURPOSE
Pineland Municipal	Pineland	MULTIPURPOSE
Pleasanton Municipal	Pleasanton	MULTIPURPOSE
Port Isabel-Cameron County	Port Isabel	MULTIPURPOSE
Post-Garza County Municipal	Post	MULTIPURPOSE
Quanah Municipal	Quanah	MULTIPURPOSE
Robert R. Wells, Jr	Columbus	MULTIPURPOSE
Rockwall Municipal	Rockwall	MULTIPURPOSE
Rooke Field	Refugio	MULTIPURPOSE
Roy Hurd Memorial	Monahans	MULTIPURPOSE
Rusk County	Henderson	MULTIPURPOSE
Rusty Allen	Lago Vista	MULTIPURPOSE
San Patricio County	Sinton	MULTIPURPOSE
San Saba County Municipal	San Saba	MULTIPURPOSE
Seymour Municipal	Seymour	MULTIPURPOSE
Shamrock Municipal	Shamrock	MULTIPURPOSE
Sherman Municipal	Sherman	MULTIPURPOSE
Slaton Municipal	Slaton	MULTIPURPOSE
Smithville Municipal	Smithville	MULTIPURPOSE

AIRPORT NAME	CITY	FUNCTIONAL CATEGORY
Sonora Municipal	Sonora	MULTIPURPOSE
Starr County	Rio Grande City	MULTIPURPOSE
Sulphur Springs Municipal	Sulphur Springs	MULTIPURPOSE
T. P. McCampbell	Ingleside	MULTIPURPOSE
Taylor Municipal	Taylor	MULTIPURPOSE
Terrell Municipal	Terrell	MULTIPURPOSE
Terry County	Brownfield	MULTIPURPOSE
Tradewind	Amarillo	MULTIPURPOSE
Weatherford (New)	Weatherford	MULTIPURPOSE
West Texas	El Paso	MULTIPURPOSE
Wheeler Municipal	Wheeler	MULTIPURPOSE
Wichita Falls-Kickapoo Downtown Airpark	Wichita Falls	MULTIPURPOSE
Wills Point Municipal	Wills Point	MULTIPURPOSE
Winkler County	Wink	MULTIPURPOSE
Winnsboro Municipal	Winnsboro	MULTIPURPOSE
Yoakum Municipal	Yoakum	MULTIPURPOSE
Benger Air Park	Friona	AGRICULTURE
Cameron Municipal Airpark	Cameron	AGRICULTURE
Chambers County-Winnie Stowell	Winnie/Stowell	AGRICULTURE
Dimmitt Municipal	Dimmitt	AGRICULTURE
Eagle Lake	Eagle Lake	AGRICULTURE
Fabens	Fabens	AGRICULTURE
Fisher County	Rotan/ Roby	AGRICULTURE
Foard County	Crowell	AGRICULTURE
Hamlin Municipal	Hamlin	AGRICULTURE
Haskell Municipal	Haskell	AGRICULTURE
Kent County	Jayton	AGRICULTURE
Knox City Municipal	Knox City	AGRICULTURE
Lamesa Municipal	Lamesa	AGRICULTURE
Munday Municipal	Munday	AGRICULTURE
Oldham County	Vega	AGRICULTURE
Spearman Municipal	Spearman	AGRICULTURE
Stratford Field (New)	Stratford	AGRICULTURE
Sunray (New)	Sunray	AGRICULTURE
T-Bar	Tahoka	AGRICULTURE
Brooks County	Faifurrias	SPECIAL
Charles R. Johnson	Port Mansfield	SPECIAL
Cotulla-LaSalle County	Cotulla	SPECIAL
Dimmit County	Carrizo Springs	SPECIAL
Duval-Freer	Freer	SPECIAL
Jim Hogg County	Hebbronville	SPECIAL
Mustang Beach	Port Aransas	SPECIAL
Possum Kingdom	Graford	SPECIAL

AIRPORT NAME	CITY	FUNCTIONAL CATEGORY
Zapata County	Zapata	SPECIAL
Dell City Municipal	Dell City	REMOTE
Edwards County	Rocksprings	REMOTE
Lajitas	Lajitas	REMOTE
Mile High	Sierra Blanca	REMOTE
Presidio Lely International	Presidio	REMOTE
Real County	Leakey	REMOTE
Terrell County	Dryden	REMOTE
Abernathy Municipal	Abernathy	ACCESS
Albany Municipal/Hickman Field	Albany	ACCESS
Cisco Municipal	Cisco	ACCESS
Crane County	Crane	ACCESS
Crystal City Municipal	Crystal City	ACCESS
Cuero Municipal	Cuero	ACCESS
Cypress River	Jefferson	ACCESS
Dilley Airpark	Dilley	ACCESS
Dublin Municipal	Dublin	ACCESS
Eldorado	Eldorado	ACCESS
Greater Morris County	Daingerfield	ACCESS
Groveton-Trinity County	Groveton	ACCESS
Higgins-Lipscomb County	Higgins	ACCESS
Jacksboro Municipal	Jacksboro	ACCESS
Kirbyville	Kirbyville	ACCESS
Madisonville Municipal	Madisonville	ACCESS
Marlin	Marlin	ACCESS
McLean/Gray County	McLean	ACCESS
Robert Lee	Robert Lee	ACCESS
San Augustine County	San Augustine	ACCESS
Stanton Municipal	Stanton	ACCESS
Stonewall County	Aspermont	ACCESS
Teague Municipal	Teague	ACCESS
The Carter Memorial	Luling	ACCESS
Upton County	McCamey	ACCESS
Winters Municipal	Winters	ACCESS

APPENDIX C

Existing Design Standards (TxDOT/Aviation Division, Policies and Standards Document)

A. Service Level - General Aviation

Role - Basic Utility

Applicable Design Standard:

- Basic Utility - Stage I (BU-I), ARC A-I, small aircraft

1. Minimum Runway:

- Length - Design for Aircraft Approach Category A and Airplane Design Group I aircraft and 75 percent of small aircraft with less than 10 passenger seats (Table 5).
- Width - 60 feet.
- Strength - 12,500 pounds.

2. Minimum Taxiway: Stub taxiway to tie-down area.

3. Minimum Apron:

- Per AC 150/5300-13 "Airport Design" - Appendix 5, based on area needed for itinerant and local parking.

4. Minimum Approach: Visual.

5. Minimum Lighting: None.

6. Minimum Visual Approach Aids: Wind indicator and segmented circle. See Section X, paragraph C and Appendix A for criteria.

7. Minimum Service: Telephone.

Typical Aircraft: Typical small aircraft in Aircraft Approach Category A and Airplane Design Group I with less than 10 passenger seats:

Aerospatiale Tobago TB 10
Aerospatiale Trinidad TB20
Beech Bonanza 33/35/36
Cessna 150/152
Cessna 172 Skyhawk
Cessna 177 Cardinal
Cessna 180/185 Skywagon
Cessna 182 Skylane
Cessna 206 Stationair
Cessna 210 Centurion
Gulfstream AA1
Gulfstream AA5 Cheetah
Mooney M20
Piper PA-20 Pacer
Piper PA-22 Tri-Pacer

Piper PA-24 Comanche
Piper PA-28 Cherokee/Warrior
Piper PA-28 Arrow
Rockwell Commander 122/114

B. Service Level - General Aviation

Role - Basic Utility

Applicable Design Standard:

- Basic Utility-Stage II (BU-II), ARC B-I
1. Minimum Runway:
 - Length - Design for Aircraft Approach Category B and Airplane Design Group I aircraft and 95 percent of small aircraft with less than 10 passenger seats (Table 6).
 - Width - 60 feet.
 - Strength - 12,500 pounds.
 2. Minimum Taxiway: Partial or full parallel taxiway if needed to meet AC 150/5300-13 line-of-sight standards. Stub taxiway to apron and runway end turnarounds if no taxiway.
 3. Minimum Apron:
 - Per AC 150/5300-13 "Airport Design" - Appendix 5, based on area needed for itinerant and local parking.
 4. Minimum Approach: Visual.
 5. Minimum Lighting: MIREL and taxiway turnout lights.
 6. Minimum Visual Approach Aids: Lighted wind indicator, rotating beacon, and segmented circle,. See Section X, paragraph C and Appendix A for criteria.
 7. Minimum Service: Basic terminal with public space, male and female restrooms, 24-hour telephone.

Typical Aircraft: The aircraft served by Basic Utility I airports plus small aircraft in Aircraft Approach Category B and Airplane Design Group I:

Beech Twin Bonanza
Beech Baron B55/56
Beach Baron 58
Beech Duchess 76
Beech Duke 1B60
Cessna 337 Skymaster
Cessna 404 Titan

Cessna 414 Chancellor
Gulfstream Cougar GA-7
Mooney M20
Piper PA-44 Seminole
Piper 31-310 Navaho
Piper 60-602P Aerostar

C. Service Level - General Aviation; Reliever

Role - General Utility

Applicable Design Standards:

- Acceptable: General Utility-Stage I, ARC B-I;
 - Recommended General Utility-Stage I, ARC B-II
1. Minimum Runway:
 - Length - Design for Aircraft Approach Category B and Design Group I aircraft and 100 percent of small aircraft with less than 10 passenger seats (Table 7).
 - Width - 60 feet acceptable, 75 feet recommended.
 - Strength - 12,500 pounds.
 2. Minimum Taxiway: Part or full parallel taxiway if needed to meet AC 150/5300-13 line-of-sight standards. Runway end turnarounds if no taxiway.
 3. Minimum Apron:
 - Per AC 150/5300-13 "Airport Design" - Appendix 5 based on area needed for itinerant and local parking.
 4. Minimum Approach: Straight-in non-precision instrument.
 5. Minimum Lighting: MIRL. Taxiway centerline or edge reflectors on taxiways to lighted runway. Taxiway exit signs in lieu of 2 blue lights may be included as part of a runway lighting project.
 6. Minimum Visual Approach Aids: Lighted wind indicator, rotating beacon, and segmented circle. PAPI-2 and REILs both ends of primary runway. PAPI-2 and REILs both ends of secondary runway if the runway is needed for wind coverage. See Section X, paragraph C for criteria on visual approach aids. See Section X, paragraph D for criteria on instrument approach aids.
 7. Minimum Service: Terminal with male and female restrooms, telephone, public space, flight planning area, manager's office, vending machines; aviation gasoline and Jet A fuel; and a local altimeter.

Typical Aircraft: The aircraft served by basic utility airports plus small airplanes in Aircraft Approach Categories A and B and Airplane Design Group II with less than 10 passenger seats:

Beech 18
Beech King Air C90A
Cessna 441 Conquest
Cessna Caravan
Cessna 402
Commander 560
Embraer 12 Xingo
Fairchild Merlin III
Piper Cheyenne III-A
TBN-700

Typical small airplanes in Aircraft Approach Categories A and B and Airplane Design Groups I and II with 10 or more passenger seats:

Beech Airliner A99
Beech King Air BE-200
Beech King Air BE-300LW
Cessna 421
De Havilland Twin Otter
Embraer 120
Fairchild Merlin IV
Fairchild Metro Executive
Mitsubishi MU-2

**D. Service Level - General Aviation; Reliever
Role - General Utility**

Applicable Design Standard:

- General Utility-Stage II, ARC B-II;
1. Minimum Runway:
 - Length- Design for Aircraft Approach Category B and Airplane Design Group II aircraft, 75 percent of the fleet and 60 percent useful load (Table 9).
 - Width - 75 feet.
 - Strength - 30,000 pounds.
 2. Minimum Taxiway: Full parallel taxiway.
 3. Minimum Apron:
 - Per AC 150/5300-13, "Airport Design" - Appendix 5 based on area needed for local and itinerant parking.

4. Minimum Approach: Straight-in, non-precision instrument, 600 ft.-1 mile minimums for Category A and B aircraft.
5. Minimum Lighting: MIRL. Taxiway centerline or edge reflectors on taxiways to lighted runway. Turnout MITLs or taxiway exit signs in lieu of 2 blue lights may be included as part of a runway lighting project.
6. Minimum Visual Approach Aids: Lighted wind indicator, rotating beacon, and segmented circle. PAPI-4 and REILs both ends of primary runway. PAPI-4 and REILs both ends of secondary runway if the runway is needed for wind coverage. See Section X, paragraph C for criteria on visual approach aids. See Section X, paragraph D for criteria on instrument approach aids.
7. Minimum Service: Terminal with male and female rest rooms, telephone, public space, flight planning area, manager's office, vending machines; aviation gasoline and Jet A fuel, 16 hour attendance; and a local altimeter.

Typical Aircraft: The aircraft served by basic utility and general utility airports plus large aircraft in Aircraft Approach Categories A and B and Airplane Design Groups I, II, or III and weighing 30,000 pounds or less:

Beech Jet BE 400 A
Beech King Air BE-350
Beech Starship BE 2000
Cessna Citation II
Cessna Citation III
Dassault Falcon-10
Dassault Falcon-20
Embraer-110 Bandeirante
Gates Learjet 28
Gates Learjet 29
Mitsubishi Diamond MU-300
Piaggio PD-808
Rockwell Sabre 40/60/65
Shorts 330
Shorts 360

Typical large airplanes in Aircraft Approach Categories A and B and Airplane Design Groups I, II or III and weighing between 30,000 and 60,000 pounds:

British Aerospace BSE 125
Canadair Challenger S
Convair 440
Convair 580
De Havilland Dash 7-100
De Havilland Dash 8-300
Dassault 941
Dassault Falcon-50
Dassault Falcon-200
Dassault Falcon-900
Fairchild FH-227 B,D
Fokker F-27-500
Fokker F-28-1000

E. Service Level - General Aviation; Reliever

Role - Transport

Applicable Design Standards:

- Transport, ARC C-II;
 - Transport, ARC C-III.
1. Minimum Runway:
 - Length- Design for Aircraft Approach Categories C and D and Airplane Design Group II aircraft, 75 percent of the fleet and 60 percent useful load (Table 9) or critical aircraft.
 - Width - 100 feet.
 - Strength - 30,000 pounds.
 2. Minimum Taxiway: Full parallel taxiway.
 3. Minimum Apron:
 - Per AC 150/5300-13, "Airport Design" - Appendix 5 based on area needed for local and itinerant parking.
 4. Minimum Approach: Straight-in, non-precision instrument, 600 ft.-1 1/2 mile minimums for Category C and D aircraft.
 5. Minimum Lighting: MIRL. Taxiway centerline or edge reflectors on taxiways to lighted runway. Turnout MITLs or taxiway exit signs in lieu of 2 blue lights may be included as part of a runway lighting project.

6. Minimum Visual Approach Aids: Lighted wind indicator, rotating beacon, and segmented circle. PAPI-4 and REILs both ends of primary runway. PAPI-4 and REILs both ends of secondary runway if the runway is needed for wind coverage. See Section X, paragraph C for criteria on visual approach aids. See Section X, paragraph D for criteria on instrument approach aids.
7. Minimum Service: Terminal with male and female rest rooms, telephone, public space, flight planning area, manager's office, vending machines; aviation gasoline and Jet A fuel, 16 hour attendance; and a local altimeter.

Typical Aircraft: The aircraft served by basic utility and general utility airports plus large airplanes in Aircraft Approach Categories A and B and Airplane Design Groups I, II, or III and weighing 30,000 pounds or less; plus typical large airplanes in Aircraft Approach Categories C and D and Airplane Design Groups I, II, or III and weighing between 30,000 and 60,000 pounds:

F. Service Level - Non-Primary Commercial Service
Role - Transport

Applicable Design Standards:

- Transport, ARC C-II;
- Transport, ARC D-I;
- Transport, ARC D-II.

1. Minimum Runway:
 - Length- Per AC 150/5325-4A, "Runway Length Requirements for Airport Design."
 - Provide runway length for the critical aircraft forecast to use the airport or use the runway length curve for large aircraft less than 60,000 pounds and for 75 percent of the fleet and 60 percent useful load, which ever is greater.
 - Width - 100 feet minimum.
 - Strength - Based on the weight of the critical aircraft forecast to use the airport.
2. Minimum Taxiway: Full parallel taxiway.
3. Minimum Apron: Per AC 150/5360-13, "Planning and Design Guidelines for Airport Terminal Facilities."
4. Minimum Approach: Precision instrument (ILS), 200 ft.-1/2 mile minimums.

FAA Order 7031.2B "Airway Planning Standard Number One - Terminal Air Navigation Facilities and Air Traffic Control Services" establishes minimum criteria for an ILS based on annual instrument approaches (AIA) by air carrier, air taxi, and general aviation aircraft.

5. Minimum Lighting: MIRL, MITL to lighted runway, MALSR with ILS.

6. Minimum Visual Approach Aids: Lighted wind indicator and rotating beacon. Segmented circle at non-towered airports with non-standard traffic patterns. PAPI-4 and REILs both ends of primary runway. PAPI-4 and REILs both ends of secondary runway if the runway is needed for wind coverage. See Section X, paragraph C for criteria on visual approach aids. See Section X, paragraph D for criteria on instrument approach aids.
7. Minimum Service: Terminal with male and female rest rooms, telephone, public space, flight planning area, manager's office, vending machines; aviation gasoline and Jet A fuel, 18 hour attendance; and a local altimeter.

FAA AC 150/5360-9, "Planning and Design of Airport Terminal Building Facilities at Nonhub Locations" and AC 150/5350-13, "Planning and Design Guidelines for Airport Terminal Facilities" establish guidance for airport terminal building development.

G. Service Level - Primary Commercial Service

Role - Transport

Applicable Design Standards:

- Transport, ARC C-II;
- Transport, ARC C-III;
- Transport, ARC D-II;
- Transport, ARC D-III;
- Transport, ARC D-IV.

Minimum Runway:

- Length- Per AC 150/5325-4A, "Runway Length Requirements for Airport Design." provide runway length for the critical aircraft forecast to use the airport.
 - Width- 100 feet minimum.
 - Strength - Based on the weight of the critical aircraft forecast to use the airport.
2. Minimum Taxiway: Full parallel taxiway for all runways used by scheduled air carriers.
 3. Minimum Apron: Per AC 150/5360-13, "Planning and Design Guidelines for Airport Terminal Facilities."
 4. Minimum Approach: Precision instrument (ILS), 200 ft.-1/2 mile minimums.

FAA Order 7031.2B, "Airway Planning Standard Number One - Terminal Air Navigation Facilities and Air Traffic Control Services" establishes minimum criteria for an ILS based on annual instrument approaches (AIA) by air carrier, air taxi, and general aviation aircraft.

5. Minimum Lighting: Medium Intensity Approach Light System with Runway Alignment Indicator Lights (MALSR), MIRL, and MITL to the lighted runway.

6. Minimum Visual Approach Aids: Lighted wind indicator and rotating beacon. Segmented circle at non-towered airports with non-standard traffic patterns.
7. Minimum Service: Terminal with telephone and rest rooms, aviation gasoline and Jet A fuel, 24 hours attendance, and a local altimeter.

FAA AC 150/5360-9, "Planning and Design of Airport Terminal Building Facilities at Nonhub Locations" and AC 150/5350-13, "Planning and Design Guidelines for Airport Terminal Facilities" establish guidance for airport terminal building development.

APPENDIX D

Recommended Design Element Changes Based on Airport Functional Category

COMMERCIAL

These airports are publicly owned and receive scheduled passenger service with boardings exceeding 2,500 passengers. Table D-1 shows the applicable design standards for commercial service airports.

TABLE D-1
Applicable Design Standards for Commercial Service Airports

Airport Role	Airport Reference Code (ARC)	Aircraft Type/Size
Transport	C-II	Large Aircraft
Transport	C-III	Large Aircraft
Transport	D-I	Large Aircraft
Transport	D-II	Large Aircraft
Transport	D-III	Large Aircraft
Transport	D-IV	Large Aircraft

Design Element Changes

No design element changes are recommended for this functional category as the focus of this report is on general aviation airports.

RELIEVER

These airports are designated by the FAA to relieve congestion at large commercial service airports and increase access to general aviation in the community. Table D-2 shows the applicable design standards for reliever airports.

TABLE D-2
Applicable Design Standards for Reliever Airports

Airport Role	Airport Reference Code (ARC)	Aircraft Type/Size
General Utility Stage I	B-I	Small Aircraft
General Utility Stage I	B-II	Large Aircraft
General Utility Stage II	B-II	Large Aircraft
Transport	C-II	Large Aircraft
Transport	C-III	Large Aircraft

Design Element Changes

No design element changes are recommended for this functional category as the focus of this report is on smaller general aviation airports.

REGIONAL

These airports are designed to support higher performance aircraft than the surrounding smaller general aviation facilities in the area and are the focal point of aviation activity for a region or the largest population center. These facilities may experience air taxi, commuter, or charter service periodically. The airside facilities should provide the best technology possible for weather, approach minimums, and approach aids. Table D-3 shows the applicable design standards for regional airports.

TABLE D-3
Applicable Design Standards for Regional Airports

Airport Role	Airport Reference Code (ARC)	Aircraft Type/Size
General Utility Stage II	B-II	Large Aircraft
Transport	C-II	Large Aircraft
Transport	C-III	Large Aircraft

Design Element Changes

The following design element changes have been recommended for airports in the regional airport functional category. They are shown in Table D-4.

TABLE D-4
Recommended Design Element Changes for Regional Airports

Design Element	Recommended Changes
Minimum Apron	Add Apron Lighting
Minimum Visual Approach Aids	Add AWOS III or Better
Minimum Service	Add Satellite Weather Data Transmission Network/Aviation Center (DTN) in terminal building

MULTIPURPOSE

The operations at these airports are diversified and are not dominated by any one type of activity. The general criteria used for the airport roles are adequate for planning purposes; however, special features may still be required to meet the needs of specific users. Table D-5 shows the applicable design standards for multipurpose airports.

TABLE D-5
Applicable Design Standards for Multipurpose Airports

Airport Role	Airport Reference Code (ARC)	Aircraft Type/Size
General Utility Stage I	B-II	Small or Large Aircraft
General Utility Stage II	B-II	Large Aircraft

Design Element Changes

No design element changes are proposed at this time for multipurpose airports.

INDUSTRIAL

This functional category describes the type of businesses associated with the airport, particularly those that are aviation-related. The itinerant traffic is specifically there to conduct business with a tenant or industry that is based at the airport. These visitors may not have a need for access or direct business within the community; however, their transactions support the economy and tax revenue base of that community. The need for a terminal or meeting facility would possibly be based upon the total operations not associated with the industrial activity. The airside facilities should provide the best

technology for weather data collection, approach minimums, and approach aids. Table D-6 shows the applicable design standards for industrial airports.

TABLE D-6
Applicable Design Standards for Industrial Airports

Airport Role	Airport Reference Code (ARC)	Aircraft Type/Size
General Utility Stage II	B-II	Large Aircraft
Transport	C-II	Large Aircraft
Transport	C-III	Large Aircraft
Transport	C-IV	Large Aircraft
Transport	D-III	Large Aircraft
Transport	D-IV	Large Aircraft

Design Element Changes

The following design element changes have been recommended for airports in the regional airport functional category. They are shown in Table D-7.

TABLE D-7
Recommended Design Element Changes for Industrial Airports

Design Element	Recommended Changes
Minimum Runway	Add runway strength appropriate to specifically identified critical aircraft
Minimum Apron	Add apron lighting
Minimum Visual Approach Aids	Add AWOS III or better
Minimum Service	Add satellite weather Data Transmission Network/Aviation Center (DTN) in terminal building

SPECIAL USE

This functional category includes airports that are used on a seasonal basis primarily for tourism, hunting, or other recreational purposes. Many of these rural airports are located near significant parks, or lakes, or provide access to various types of hunting. The operations at these sites are typically low volume except in season and may include large and small airplanes. Many of these airports provide a significant contribution to the local economy. Special use airports located in South Texas serve exotic game range hunting, deer hunting, and bird hunting in season. Table D-8 shows the applicable design standards for these special use airports serving primarily hunting needs. Table D-10 shows the applicable design standards for the special use airports serving primarily parks and lakes. Tables D-9 and D-11 show the recommended design element changes for the hunting and parks/lakes uses respectively.

TABLE D-8
Applicable Design Standards for Special Use Airports - Hunting

Airport Role	Airport Reference Code (ARC)	Aircraft Type/Size
General Utility Stage II	B-II	Large Aircraft

Design Element Changes

The following design element changes have been recommended for special use airports serving the needs of hunting communities in the state. They are shown in Table D-9.

TABLE D-9
Recommended Design Element Changes for Special Use Airports - Hunting

Design Element	Recommended Changes
Minimum Taxiway	Delete need for full parallel taxiway
Minimum Service	Delete manager's office, vending machines, 16 hour attendance, and a local altimeter

Table D-10 shows the applicable design standards for special use airports serving recreational areas of the state including parks and lakes.

TABLE D-10
Applicable Design Standards for Special Use Airports - Parks/Lakes

Airport Role	Airport Reference Code (ARC)	Aircraft Type/Size
Basic Utility Stage I	B-I	Small Aircraft

Design Element Changes

The following design element changes in Table D-11 are recommended for special use airports serving recreational parks and lakes.

TABLE D-11
Recommended Design Element Changes for Special Use Airports - Parks/Lakes

Design Element	Recommended Change
Minimum Runway	Minimum runway width 50 feet paved or 75 feet stabilized turf

AGRICULTURAL

This functional category includes airports that serve areas of intense agricultural production. Agricultural spraying services are required to support the production capability within many small communities; therefore, many of the design standards of these general aviation airports are specifically related to the needs of agricultural operators. Terminal facilities and runway lights may not be required. Agricultural activities may occur at a variety of facilities and the special needs of this type of activity, including use of chemicals and traffic patterns, may require additional safety features. Additional roads may be required to provide access for chemical trucks and to prevent trucks from operating on the aircraft apron.

Segregated agricultural aprons may need to be constructed when there is also significant non-agricultural operations. The applicable design standards for agricultural airports are shown in Table D-12.

TABLE D-12
Applicable Design Standards for Agricultural Airports

Airport Role	Airport Reference Code (ARC)	Aircraft Type/Size
Basic Utility Stage I	B-I	Small Aircraft

Design Element Changes

The following design element changes in Table D-13 are recommended for special use airports serving the agricultural community.

TABLE D-13
Recommended Design Element Changes for Agricultural Airports

Design Element	Recommended Changes
Minimum Runway	Minimum runway width 50 feet paved or 75 feet stabilized turf
Minimum Apron	Add agricultural apron (self-contained), 80,000 pound PCC agricultural chemical truck parking pad adjacent to PCC agricultural aircraft loading apron designed for chemical wash-down and containment
Other	Access road, paved or gravel, suitable for carrying an 80,000 pound chemical truck from the public road to the agricultural chemical truck parking pad.

The truck and airplane loading design elements shown for agricultural airports may be appropriate at any airport with significant agricultural operations regardless of the functional classification of the airport.

REMOTE

This functional category includes airports serving remote areas. Many rural communities are separated by more than 100 or more miles from other rural populations. This is frequently true in west and south Texas. Many typical rural activities such as ranching and oil production require access to these communities by air. In addition, emergency medical access by air is essential to remote communities. The applicable design standards for these remote airports are shown in Table D-14.

TABLE D-14
Applicable Design Standards for Remote Airports

Airport Role	Airport Reference Code (ARC)	Aircraft Type/Size
Basic Utility Stage II	B-I	Small Aircraft

Design Element Changes

Table D-15 shows the recommended design element changes for remote airports.

TABLE D-15
Recommended Design Element Changes for Remote Airports

Design Element	Recommended Change
Minimum Approach	Add circling or straight-in published instrument approach

ACCESS

This functional category includes airports that provide minimal service to the community and, as a result, would not likely receive funds to replace the facility. These airports are eligible to receive funding for pavement preservation. The applicable design standards are shown in Table D-16.

TABLE D-16
Applicable Design Standards for Access Airports

Airport Role	Airport Reference Code (ARC)	Aircraft Type/Size
Basic Utility Stage I	B-I	Small Aircraft

Design Element Changes

Table D-17 shows the recommended design element changes for remote airports.

TABLE D-17
Recommended Design Element Changes for Access Airports

Design Element	Recommended Change
Minimum Runway	Minimum runway width 50 feet paved or 75 feet stabilized turf

Stabilized turf runways can be suitable for agricultural and access airports.

APPENDIX E

Business Aircraft Users Survey



Texas Department of Transportation

AVIATION DIVISION

125 E. 11TH STREET • AUSTIN, TEXAS 78701-2483 • 512/416-4500 • FAX 512/416-4510

May 15, 2000

Dear Business Aircraft User:

The Aviation Division of the Texas Department of Transportation needs your professional advice. In an effort to determine the needs of business aircraft users, the Aviation Division has asked the Texas Transportation Institute at Texas A&M University to develop and administer a survey.

The purpose of this survey is to better understand the needs of the business aviation community with respect to airport locations, airport facilities, airport geometrics, instrument and visual approach facilities, and access to the airport system in Texas.

As a business aircraft user, your opinion is important to us. This survey presents an excellent opportunity for you to make your personal and corporate needs known as well as to express your wants and desires for the airports you use and those airports that you would like to use. Additional space is also provided on the survey for your suggestions and comments.

If you have any questions or would like more information, please call Linda Howard at the Texas Department of Transportation – Aviation Division at 1-800-68-PILOT or Jeff Borowiec at the Texas Transportation Institute at (979) 845-5200. I know your time is valuable and any assistance you can give us will be greatly appreciated. Please return this survey by May 30, 2000 in the enclosed postage-paid envelope. We look forward to hearing from you.

Sincerely,

David Fulton
Director

SURVEY OF BUSINESS AIRCRAFT USERS

1. Please list the type(s) of aircraft you use.

<u>Manufacturer</u>	<u>Model/Year</u>	<u>Seats</u>	<u>Typical Passenger Load</u>	<u>Annual Hours Flown</u>	<u>Runway length & width Requirements</u>	<u>Maximum Gross Weight</u>
_____	_____	_____	_____	_____	_____X_____	_____
_____	_____	_____	_____	_____	_____X_____	_____
_____	_____	_____	_____	_____	_____X_____	_____
_____	_____	_____	_____	_____	_____X_____	_____
_____	_____	_____	_____	_____	_____X_____	_____
_____	_____	_____	_____	_____	_____X_____	_____
_____	_____	_____	_____	_____	_____X_____	_____

2. How many of these aircraft are:

_____ Owned
 _____ Leased
 _____ Fractionally Owned

3. Your aircraft's runway requirements are determined by: (Check all that apply)

_____ Aircraft performance data
 _____ Company policy
 _____ Insurance requirements
 _____ Other (Please specify) _____

4. Which airports in Texas do you use and approximately how often do you fly to/from each on an annual basis? Arriving and departing from an airport is one trip.

<u>Airport name or Identifier</u>	<u>Number of trips per year</u>
1. _____	_____
2. _____	_____
3. _____	_____
4. _____	_____
5. _____	_____
6. _____	_____
7. _____	_____
8. _____	_____
9. _____	_____
10. _____	_____

5. These facilities were selected because: (Select all that apply)

- ☐ They have the terminal facilities we need
☐ They have the instrument approaches we require
☐ They have the maintenance and fuel services we need
☐ The location is ideal for our business
☐ Our aircraft is based there
☐ Other (Please specify) _____

6. Have you experienced any access problems at airports you use or would like to use? Access is the ability to utilize the facilities and services at the airport.

Yes [☐] No [☐]

If yes, what is the nature of the problem and the airport involved?

7. For the Texas general aviation airports you use, please list the number of airports you consider to be acceptable and unacceptable for each of the following elements:

	<u>Number Acceptable</u>	<u>Number Not Acceptable</u>	<u>If not acceptable list airport name</u>
NAVAIDS	[<input type="checkbox"/>]	[<input type="checkbox"/>]	_____
Visual approach aids	[<input type="checkbox"/>]	[<input type="checkbox"/>]	_____
Terminal facilities	[<input type="checkbox"/>]	[<input type="checkbox"/>]	_____
Runway length	[<input type="checkbox"/>]	[<input type="checkbox"/>]	_____
Runway width	[<input type="checkbox"/>]	[<input type="checkbox"/>]	_____
Runway surface condition	[<input type="checkbox"/>]	[<input type="checkbox"/>]	_____
Runway lighting	[<input type="checkbox"/>]	[<input type="checkbox"/>]	_____
Support services	[<input type="checkbox"/>]	[<input type="checkbox"/>]	_____
Fuel availability	[<input type="checkbox"/>]	[<input type="checkbox"/>]	_____
Fuel price	[<input type="checkbox"/>]	[<input type="checkbox"/>]	_____
Other _____	[<input type="checkbox"/>]	[<input type="checkbox"/>]	_____
Other _____	[<input type="checkbox"/>]	[<input type="checkbox"/>]	_____

Additional Comments: _____

8. For the Texas general aviation airport terminals you use, please list the number of airports you consider to be acceptable and unacceptable for each of the following amenities:

	Number <u>Acceptable</u>	Number Not <u>Acceptable</u>	Number Not <u>Available</u>	If not acceptable <u>list airport name</u>
Rest Rooms	[]	[]	[]	_____
Food/Drinks	[]	[]	[]	_____
Telephones	[]	[]	[]	_____
Courtesy Car	[]	[]	[]	_____
Rental Car	[]	[]	[]	_____
Taxi Service	[]	[]	[]	_____
Television	[]	[]	[]	_____
Waiting Area	[]	[]	[]	_____
Meeting Room	[]	[]	[]	_____
Flight Planning Room	[]	[]	[]	_____
Weather Information	[]	[]	[]	_____
Other _____	[]	[]	[]	_____
Other _____	[]	[]	[]	_____

Additional Comments _____

9. Are there any airports in Texas that you cannot use but would like to use?
 (i.e., runway too short, facilities not adequate, etc.)

Yes [] No []

If yes, please name the airport and why you are unable to use it. _____

How frequently would you use the airport annually if the improvements were made? _____

10. Are there any locations in Texas that you need to access but do not have an airport?

Yes [] No []

If yes, please name the location(s) _____

11. Where is/are your company's aircraft based?

State(s) _____
Airport(s) (name or LOCID) _____

12. Why was this airport chosen to base the aircraft? (Select all that apply)

Location/Close to company offices	[]
Suitable hangar/parking facilities	[]
Maintenance services	[]
Fuel services	[]
Cost (i.e., lease, fees, services, etc.)	[]
Not congested/Not too busy	[]
Accessibility/Ease of access	[]
Other	_____

13. Do you fly into any privately owned airports in Texas?

Yes [] No []

**If yes, please indicate which private airports and why you use them?
(i.e., convenience, cost, accessibility, services, etc.)**

14. Where in Texas do you fly which frequently requires an instrument approach?

<u>Airport</u>	<u>Approach Adequate</u>	<u>Approach Not Adequate</u>
_____	[]	[]
_____	[]	[]
_____	[]	[]

Additional comments regarding instrument approaches:

15. Please check which minimum instrument approach you REQUIRE?

NDB	[]	VOR	[]
RNAV/FMS	[]	VOR/DME	[]
Localizer	[]	ILS	[]
GPS	[]	None	[]
Other	[]	_____	

16. Please check which minimum instrument approach you PREFER?

NDB	[]	VOR	[]
RNAV/FMS	[]	VOR/DME	[]
Localizer	[]	ILS	[]
GPS	[]	None	[]
Other	[]	_____	

17. Please check your preferred visual aid(s).

VASI/PAPI [] OR PLASI []

Tetrahedron [] OR Wind Sock []

18. Please check the minimum type of runway lighting you find adequate for your needs.

LIRL [] MIRL [] HIRL []

19. Within the next five years, does your firm plan to: (Check all that apply)

Decrease the number of aircraft owned	[]
Make no changes to the fleet	[]
Upgrade the type of aircraft in the fleet	[]
Increase the number of aircraft owned	[]
Participate in a fractional ownership program	[]

20. If you plan to upgrade or increase the number of aircraft you use, will your new aircraft be more demanding on airport facilities (i.e., require longer, wider, or stronger runway/taxiway, or more apron/hangar space)?

No [] Yes [] N/A []

If yes, please specify type of facility that will be needed/required.

21. Is your aircraft equipped with (Check all that apply):

LORAN	[]	TCAS II	[]
FMS	[]	GNS	[]
Wx Radar	[]	EFIS	[]
DME	[]	Flight Director	[]
Autopilot	[]	GPS	[]
EGPWS/Ground		Differential GPS	[]
Warning System	[]	Other_____	[]

22. Do you plan to install any of the following within one year? (Check all that apply)

LORAN	[]	TCAS II	[]
FMS	[]	GNS	[]
Wx Radar	[]	EFIS	[]
DME	[]	Flight Director	[]
Autopilot	[]	GPS	[]
EGPWS/Ground		Differential GPS	[]
Warning System	[]	Other_____	[]
None	[]		

23. Where do you get weather information PRIOR to a flight? (Check all that apply)

AFSS	[]	Television	[]
AWOS/ASOS	[]	DUAT	[]
The Internet	[]		
Other(s) (Please specify) _____			

If you selected the Internet, which website(s) do you use _____

24. How useful are the weather briefing stations located in the general aviation terminals that you use?

Very useful	[]	Moderately useful	[]
Not useful	[]	Do not know	[]
Do not use	[]		

25. Are weather information services at the Texas airports you use adequate?

Yes [] No [] Do not know []

If no, please list the airport and what can be done to improve them?

26. Overall, how would you rate the condition of airports in Texas?

Excellent	[]	Good	[]
Fair	[]	Poor	[]

27. Overall, how do you find the access to airports in Texas?

Excellent	[]	Good	[]
Fair	[]	Poor	[]

28. Has the use of business aircraft allowed you to reach more communities/customers/ marketplaces than using commercial airline service?

Yes [] No []

29. Has your company's use of business aircraft increased in the last 5 years?

Yes [] No []

If yes, to what is this attributable? (Check all that apply)

_____ Business growth/expansion
_____ Good economic conditions
_____ Fractional ownership programs
_____ Need to access rural/small communities
_____ Other (Please specify) _____

30. Is your company's use of business aircraft expected to increase in the next 5 years?

Yes [] No []

If yes, to what is this expectation attributable? (Check all that apply)

_____ Business growth/expansion
_____ Good economic conditions
_____ Fractional ownership programs
_____ Need to access rural/small communities
_____ Other (Please specify) _____

31. Do you participate in a fractional ownership program?

Yes [] No []

If yes, has it allowed your company to do more flying than it otherwise would have been able to do through more conventional methods (commercial flying or owning/leasing the aircraft yourself)?

Yes [] No []

If no, are you:

- ☐ Considering participation in a fractional ownership program
☐ Planning on participating in a fractional ownership program only
☐ Planning on participating in a fractional ownership program as well as operating your own aircraft
☐ Not considering fractional ownership programs

32. What is your firm's primary product or service?

33. The latest annual revenues of your company were:

- ☐ Less than \$100,000
☐ \$100,000 to < \$500,000
☐ \$500,000 to < \$1 million
☐ \$1 million to < \$10 million
☐ \$10 million to < \$50 million
☐ \$50 to \$100 million
☐ More than \$100 million

34. The total number of employees in your company is:

- ☐ Less than 5
☐ 5 to 10
☐ 11 to 25
☐ 26 to 50
☐ 51 to 100
☐ 101 to 500
☐ More than 500

35. What PERCENTAGE of your company's flying time in Texas is attributable to transporting the following:

Employees _____ %
Clients _____ %
Goods _____ %
Other (Please specify) _____ %
_____ %

General Comments:

If we have any further questions, may we give you a call? All responses will be confidential.

Contact Person: _____

Company Name: _____

Telephone: _____

Thank you for your time and help!!

